City of Veneta

LANE COUNTY, OREGON

2016 Wastewater Master Plan & Recommended Capital Improvement Plan

November 2016

Civil West Engineering Services, Inc.

REGISTERED PROFESSIONAL ENGINEER
83524PE
OREGON
NOV. 10, 2009
MATTHEW D. WADLINGTON
EXPIRATION DATE: 06/30/2018

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Executive Summary

Background

Veneta was incorporated in 1962, chiefly in an effort to provide clean water for the growing town. Incorporation meant that the town would be able to create a taxing entity that would enable the town to form public utility districts. High on the list of utilities were safe water and wastewater treatment facilities. The first wastewater treatment system was completed in 1970 and consisted of a single cell, 3.86-acre facultative lagoon followed by chlorination for winter discharges. The wastewater treatment plant was upgraded in 1976 to include two facultative lagoons with a total of 14.71 acres, a submerged rock filter, and a larger chlorine contact chamber. The existing Biolac wastewater treatment plant was brought online in 2002, employing a poplar plantation north of highway 126 for summer discharge.

In 2009, Weber Elliott Engineers, P.C. completed a “Wastewater System Master Plan & Capital Improvement Plan”. The 2009 WWMP/CIP made recommendations for the 20-year period 2010-2030. At the time of the 2009 report, Veneta had been experiencing almost a decade of rapid population growth and desired to be prepared for expansion of the community. Due to socio-economic factors in the area, the City has not grown at the rates predicted in the 2009 plan. As such, the recommendations and capacity projections were overstated.

The forecasted 2030 population from the 2009 Wastewater System Master Plan and Capital Improvement Plan was 9960 persons. This number was based on the 2004 adopted forecast for the year 2030 from the Lane Council of Governments estimate. Current data from the Coordinated Population Forecast for Lane County predicts a 2036 population of 7,795, which is still only 78% of the 2009 report’s 2030 projection. Because of the diminished population growth that the City has seen since the report was done in 2009, many of the upgrades recommended in the 2009 Wastewater Master Plan are not required as soon as the capital improvement schedule indicated.

The current Wastewater Treatment Plant has a Class 1 rated design capacity of 1.25 MGD. Over the 5-year study period flow to the plant has exceeded capacity 72 times. Many of the flows were close to double the 1.25 MGD capacity. Projected peak hourly flows for the year 2036 will exceed 3.5 MGD. In the 2009 WWMP/CIP, the Biolac basins were considered to be running at 85% of the 1.25 MDG firm design capacity. Current loading is somewhat larger than the 2009 loading, putting the Biolac aeration basins close to design capacity. Increased development/flow would further compound the need to upgrade capacity of the Biolac system.

The wastewater treatment plant has been able to operate within allotted permit levels by the use of a 4-million-gallon surge pond connected to the influent lift station. Based on population growth projections, the buffering capacity of the surge pond would reach the 4-million-gallon capacity in 2026 at a population of 6200. This estimate is population driven and therefore upgrades may be required sooner or later than 2026 due to development or lack thereof.

Prior to the population increasing to 6200, it is recommended that the Biolac basins be upgraded to handle the projected flows. The existing two Biolac aeration basins would need to be expanded to a four basin system. The headworks would also need to either be replaced or modified to handle the increased flows and in particular, the flow splitting necessary to accommodate the new four basin Biolac.

Much of the older portion of the wastewater collection system in Veneta was constructed from asbestos concrete sewer pipe. After time, these pipe sections are known for having leaky joints due to the degradation of grout or gasket material in the joint. The City has been diligent with replacing sections of pipe that previous I/I studies have identified as contributors to infiltration. Current deficiencies in the collection system may still exist from those identified in the 2009 WWMP/CIP. Flow mapping and smoke testing may help to confirm the effectiveness of the recent repairs, and can also help to identify smaller sources of I/I that were masked during prior studies by larger I/I sources.

The firm design capacity for the Jeans Road lift station is 130 gpm which is inadequate for the calculated PIF of 215 gpm for the service area. This lift station should either be upgraded to pump the calculated peak flow in the near future, or it should be rebuilt.

Based on city limits, topography and population density, the areas of the town most apt to see larger growth rates are the area north of Highway 126, and the eastern end of town. Typically, when isolated development occurs, the entire sewer main connecting the proposed development would have to be analyzed to ensure it has sufficient capacity to carry the increased flows.

Currently, the Pine Street lift station is operating on a duplex system with both pumps occasionally running more than 12 hours. To meet DEQ redundancy requirements, the lift station must be able to handle the PIF with the largest pump out of service. The Pine Street lift station would need to be upgraded to meet this requirement.

Section 6 identifies several options to provide sewer service to the east portion of the City. Option 3 is the recommended option, it recommends relocating the Jeans Road lift station and building a new east side lift station. The new east side lift station would be located near the intersection of Huston Road and Hunter Road. The new east side lift station would bypass the existing central gravity system and would pump flow up to the gravity system at Jeans Road and Hope Lane. The existing gravity system in Jeans Road would need to be upsized to handle both projected east side flows and projected flows in the area local to the gravity system. A new gravity system would connect the gravity system at the existing Jeans Road Lift Station at the corner of Jeans Road and Hwy 126 to a new Jack Kelly Drive Lift Station near the intersection of Jack Kelly Drive and 8th Street. The Jack Kelly Drive Lift Station would be built to handle the flows from the area north of the highway in addition to the flows pumped from the new east side lift station.

Recommended Improvement Projects

Due to the age and deficiencies of portions of the City's wastewater system, we have evaluated options for improvements. Project classification and summary of the final recommendations are below:

Priority 1 Projects: Priority 1 projects are the most critical and should be undertaken as soon as possible in order to meet DEQ requirements. Priority 1 projects should be considered as the most immediate needs for the City's wastewater system.

Priority 2 Projects: These are projects that should be undertaken within the first half of the planning period to restore aging facilities to newer operating conditions. While they do not have to be undertaken immediately, the City should include them in their Capital Improvement Plan and obtain funding to undertake these projects.

Priority 3 Projects: Priority 3 projects are projects that are primarily dependent on development and expansion of the collection system to provide sewer service to new areas. Priority 3 projects are driven by development and the need to expand the collection system to service new properties and new subdivisions. Funding for Priority 3 projects are to be financed through a combination of City funds, SDC funds, and developer contributions. As these projects are development driven, they need not be scheduled for implementation. They should, however, be included within the CIP and considered within any wastewater SDC methodology developed by the City.

Priority 1 Projects:

Project CWT1 - 2017: The current treatment plant outfall is a simple 18" pipe discharging effluent into the Long Tom River. This method does not produce adequate mixing. It is recommended that the outfall be fitted with a reducing elbow to enhance mixing of the effluent per the 2016 Mixing Zone Study.

Project CWC2 - 2017: Pine Street lift station does not currently meet the redundancy requirements as outlined by the Department of Environmental Quality. New pumps should be installed which would increase the capacity of the lift station to meet the required standards.

Project CWC3 - 2017: Jeans Road lift station does not currently meet the redundancy requirements as outlined by the Department of Environmental Quality. New pumps should be installed which would increase the capacity of the lift station to meet the required standards. Note, if CWC1 occurs prior to CWC3, then CWC3 is not necessary.

Priority 2 Projects:

Project CWT2 - 2020: DMRs from 2010 – 2015 indicate that the effluent values for TSS loading have been exceeded on two days. This project provides for the installation of a disk type effluent filter that would be used during high flow events to keep the effluent TSS loading within the permitted values.

Project CWC1 - 2017: This project significantly upgrades and relocates Jeans Road lift station to handle future peak flows. The Jeans Road lift station is near capacity with the current pumps. The new lift station should be sized to accommodate the projected peak flows from Basins 6 and 7. This project includes the new lift station, force main, new gravity system along Jack Kelly Drive and capacity upgrades to the existing gravity system from Jeans Road and Hope Lane to the new lift station.

Project CWC4 - 2019: This project provides for the construction of the east side lift station and force main. The lift station would be built near the intersection of Huston Road and Hunter Road. The 10” force main would run north up Huston Road and turn west at Highway 126. The force main would then turn north at Cornerstone Drive. The force main would then turn west on Jeans Road for 400’ and connect to the existing gravity system. This project should be scheduled for design to begin two years prior to any future east side development.

Priority 3 Projects:

Project T3 2022: Upgrades to the headworks and influent lift station to accommodate larger future flows. These upgrades would need to be done eventually regardless of the rate of development in the City, and it would need to be done sooner if the City’s rate of development is accelerated. These upgrades coincide with the Biolac basin expansion and should all be in place prior to the population reaching 6200, or at current growth rates the year 2026.

Project T4 2022: This project involves the abandonment of the existing FSLs to make room for the creation of the (2) new Biolac aeration basins. This project should also incorporate the construction of replacement FSLs. This project needs to take place prior to the Biolac expansion, and like the other priority 2 projects, is driven by the population reaching 6200.

Project T5 2022: This project provides for the design and installation of the (2) new Biolac aeration basins. Projects T2, T3 and T4 need to be complete prior to starting construction on the new Biolac basins.

Summary of Capital Improvement Plan

Recommended Improvements			
Priority 1 Projects			
Start Date for Design	**Facility**	**Description**	**Total Cost**
ASAP	WW Treatment Plant – CWT1	Outfall Diffuser	$25,000
2017	Conveyance System – CWC2	Upgrade Pine Street Lift Station Capacity	$54,000
2017	Conveyance System – CWC3*	Upgrade Jeans Road Lift Station Capacity	$107,000
		Total Priority 1 Projects:	**$186,000**
Priority 2 Projects			
Start Date for Design	**Facility**	**Description**	**Total Cost**
2020	WW Treatment Plant – CWT2	Disk Filter	$384,000
2017	Conveyance System – CWC1*	Install Jack Kelly Drive Lift Station/Force Main/Gravity Line	$3,051,000
2019	Conveyance System – CWC4	Install Huston Road Lift Station/Force Main	$1,996,000
		Total Priority 2 Projects:	**$5,431,000**
Priority 3 Projects			
Start Date for Design	**Facility**	**Description**	**Total Cost**
2022	WW Treatment Plant – T3	Upgrade Headworks	$90,000
2021	WW Treatment Plant – T4	Demo/Relocate FSLs	$890,000
2022	WW Treatment Plant – T5	Construct Biolac Basins	$2,500,000
		Total Priority 3 Projects:	**$3,480,000**
		Total All Projects:	**$9,097,000**
* Note, if CWC1 occurs prior to CWC3, then CWC3 is not necessary.			

CAPTIAL IMPROVEMENT PLAN

		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Collection System Projects																						
CWC1	**Predesign**		$122,055																			
	Design			$244,109																		
	Install Jack Kelly Drive Lift Station and FM*				$2,685,201																	
CWC2	**Predesign**		$2,160																			
	Design			$4,320																		
	Upgrade Pine Street Lift Station Capacity				$47,520																	
CWC3	**Predesign**		$4,280																			
	Design			$8,560.00																		
	Upgrade Jeans Road Lift Station Capacity*				$94,160																	
CWC4	**Predesign**				$79,856																	
	Design					$159,712																
	Install Huston Road Lift Station and FM						$1,756,830															
***Note, If CWC1 is completed prior to CWC3, CWC3 is not necessary.**																						
Wastewater Treatment Plant Projects																						
CWT1	**Predesign**		$1,000																			
	Design			$2,000																		
	Install Outfall Diffuser				$22,000																	
CWT2	**Predesign**					$15,360																
	Design						$30,720															
	Install Disk Filter							$337,920														
T3	**Predesign**							$3,600														
	Design								$7,200													
	Upgrade Headworks									$79,200												
T4	**Predesign**						$35,600															
	Design							$71,200														
	Demo/Relocate FSLs								$783,200													
T5	**Predesign**							$100,000														
	Design								$200,000													
	Construct Biolac Basins									$2,200,000												
	Fiscal Year Totals:		**$129,495**	**$258,989**	**$2,928,737**	**$175,072**	**$1,823,150**	**$512,720**	**$990,400**	**$2,279,200**												

1 Introduction

1.1 Background and Need

1.1.1 Community Background

The City of Veneta was laid out adjacent to the railroad from Eugene to the coast in 1912 by Edmund Hunter. The City is located in Lane County, Oregon 14 miles east of Eugene and just south of the Fern Ridge Reservoir. Veneta was incorporated in 1962 and has a current population of 4690.

1.1.2 Wastewater System Background

Veneta was incorporated in 1962, chiefly in an effort to provide clean water for the growing town. Incorporation meant that the town would be able to create a taxing entity enabling the town to form public utility districts. High on the list of utilities were safe water and wastewater treatment facilities. The first wastewater treatment system was completed in 1970 and consisted of a single cell, 3.86-acre facultative lagoon followed by chlorination for winter discharges. The wastewater treatment plant was upgraded in 1976 to include two facultative lagoons with a total of 14.71 acres, a submerged rock filter, and a larger chlorine contact chamber. The existing Biolac wastewater treatment plant was brought online in 2002, employing a poplar plantation north of highway 126 for sludge application and summer discharge.

1.1.3 Prior Study and Planning Documents

The following provides a summary of the recent wastewater planning efforts done for the City of Veneta. These documents were used to develop the existing system and history:

1. City of Veneta Wastewater System Master Plan & Capital Improvement Plan: Completed in April 2009 by Weber Elliott Engineers, P.C. This study recommended capital improvements to the wastewater collection, wastewater treatment, and water reuse systems.

1.1.4 Need for Master Plan Update

The City of Veneta operates and maintains wastewater facilities spread throughout the town. Components of the wastewater system include collection, conveyance, treatment, discharge and reuse. In 2009, Weber Elliott Engineers, P.C. completed a "Wastewater System Master Plan & Capital Improvement Plan" which is, essentially, a wastewater facilities plan for the City of Veneta. The 2009 WWMP/CIP made recommendations for the 20-year period 2010-2030. At the time of the 2009 report, Veneta had been experiencing almost a decade of rapid population growth and desired to be prepared for expansion of the community. Due to socio-economic factors in the area, the City has not grown at the rates predicted in the 2009 plan. As such, the recommendations and capacity projections are overstated. The City wishes to update the 2009 plan, to reevaluate projected flows based on current data, and to modify the Capital Improvement Plan accordingly.

1.1.5 Study Authorization

The City of Veneta authorized Civil West to develop a Wastewater Master Plan Update by a contract dated September 28, 2015. Services are in accordance with this professional services contract and the Civil West proposal for the project which was presented to the City on September 24, 2015. A kick-off meeting was conducted on October 15, 2015 with Civil West and City staff to initiate the planning work and to begin the necessary data collection.

2 Study Area

2.1 General Information

This section provides a detailed description of the project location, physical environment along with an evaluation of the population trends and projections.

2.1.1 Planning Area Location

The City of Veneta is a small community located in Lane County, Oregon, about 14 miles west of Eugene, and adjacent to the Long Tom River. Oregon State Highway 126 intersects the City and is the primary transportation route to and from the City as well as the primary route between Eugene and the coast. The City's Coordinates are 44°3′0″N 123°21′9″W. A location map identifying the City of Veneta relative to the State of Oregon is presented in Figure 2.1.1

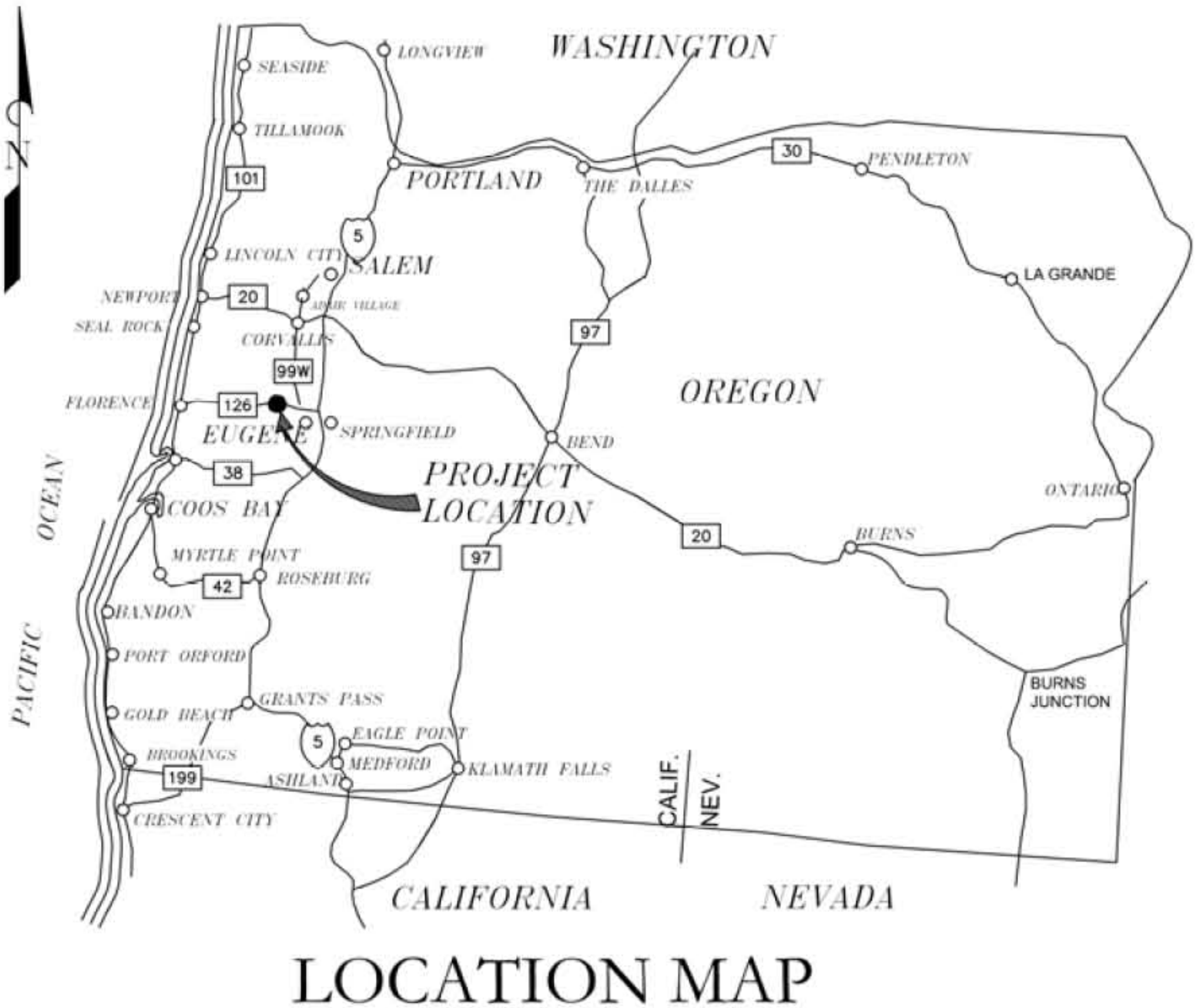


Figure 2.1.1: Location Map of City of Veneta

2.1.2 Cultural Resources

There are no historic landmarks in or near the City. However, the City is in close proximity to Fern Ridge Reservoir and has an abundance of wildlife and regions with natural areas for hiking and camping. The City has also been the site of the Oregon Country Fair since 1970.

2.1.3 Land Use

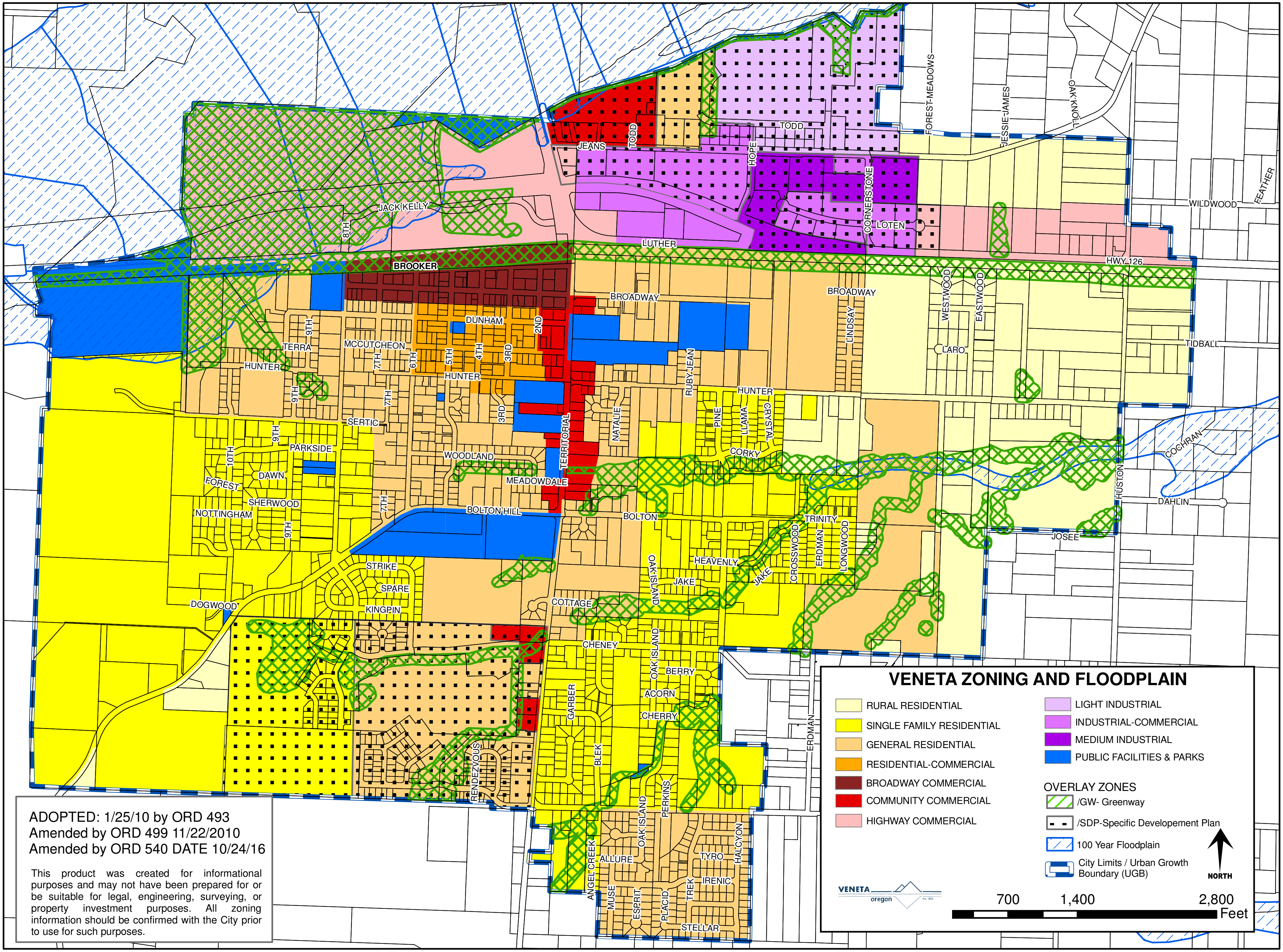
The City of Veneta is surrounded by agricultural land, ranging from farms to wineries. Land use within the City is a mixture of residential, commercial, and industrial. The City has a total area of 2.57 square miles and is at an average elevation of 418 feet above sea level.

2.1.4 Zoning Information

According to the Veneta Land Development Ordinance No. 493 (City of Veneta, 2015), the following zones have been established:

- Rural Residential
- Single-Family Residential
- General Residential
- Residential-Commercial
- Broadway Commercial
- Community Commercial
- Highway Commercial
- Industrial-Commercial
- Light Industrial
- Medium Industrial
- Public Facilities and Parks

A Zoning Map of the City limits and the Urban Growth Boundary is provided as Figure 2.1.4

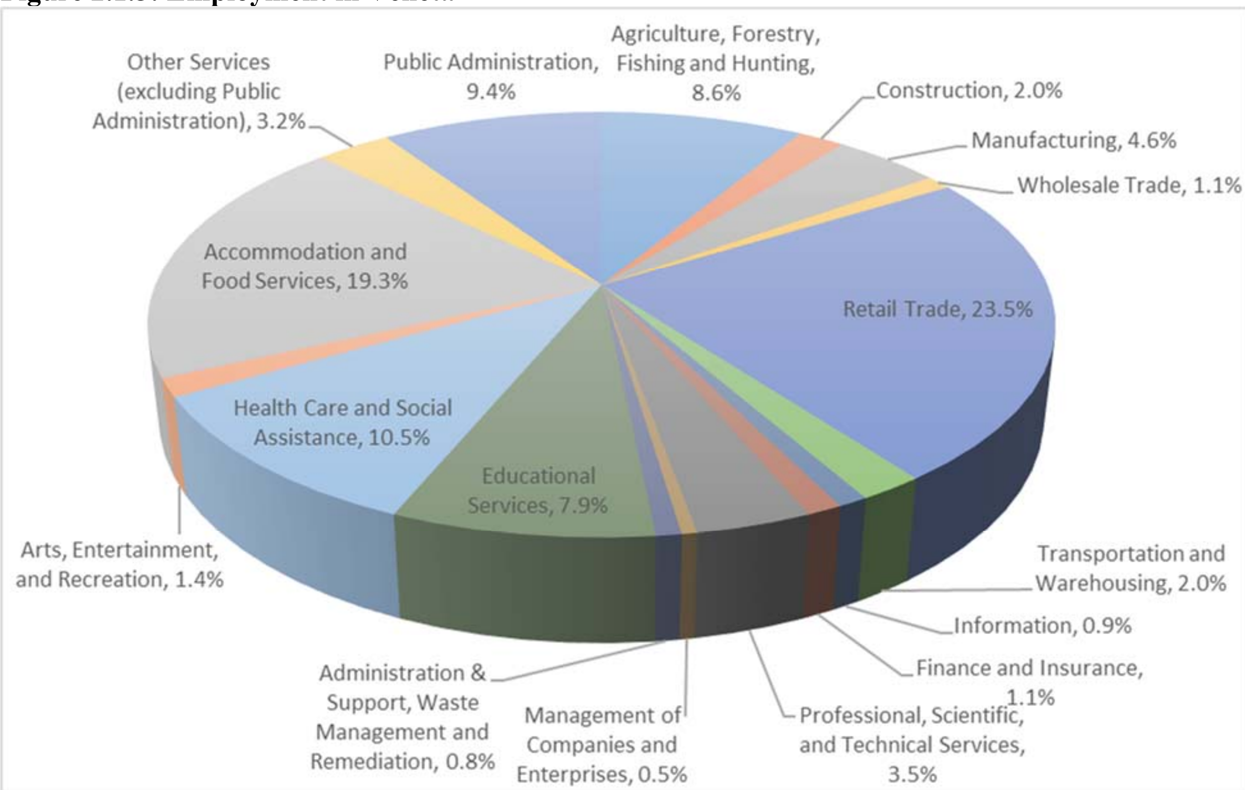

VENETA ZONING AND FLOODPLAIN
RURAL RESIDENTIAL
SINGLE FAMILY RESIDENTIAL
GENERAL RESIDENTIAL
RESIDENTIAL-COMMERCIAL
BROADWAY COMMERCIAL
COMMUNITY COMMERCIAL
HIGHWAY COMMERCIAL
LIGHT INDUSTRIAL
INDUSTRIAL-COMMERCIAL
MEDIUM INDUSTRIAL
PUBLIC FACILITIES & PARKS
OVERLAY ZONES
/GW- Greenway
/SDP-Specific Developement Plan
100 Year Floodplain
City Limits / Urban Growth Boundary (UGB)
NORTH
700
1,400
2,800
Feet
VENETA oregon
ADOPTED: 1/25/10 by ORD 493
Amended by ORD 499 11/22/2010
Amended by ORD 540 DATE 10/24/16
This product was created for informational purposes and may not have been prepared for or be suitable for legal, engineering, surveying, or property investment purposes. All zoning information should be confirmed with the City prior to use for such purposes.
FOREST-MEADOWS
JESSIE-JAMES
OAK KNOLL
TODD
JEANS
HOPE
FEATHER
WILDWOOD
CORNERSTONE
LOTEN
JACK KELLY
8TH
LUTHER
BROOKER
HWY 126
BROADWAY
WESTWOOD
EASTWOOD
DUNHAM
9TH
2ND
LINDSAY
TERRA
MCCUTCHEON
7TH
6TH
5TH
4TH
3RD
LARO
TIDBALL
HUNTER
RUBY JEAN
PINE
LLAMA
CRYSTAL
SERTIC
NATALIE
TERRITORIAL
PARKSIDE
10TH
WOODLAND
CORKY
COCHRAN
DAWN
FOREST
MEADOWDALE
HUSTON
SHERWOOD
DAHLIN
NOTTINGHAM
BOLTON HILL
BOLTON
TRINITY
JOSEE
CROSSWOOD
ERDMAN
LONGWOOD
HEAVENLY
OAK ISLAND
STRIKE
JAKE
SPARE
KINGPIN
DOGWOOD
COTTAGE
CHENEY
BERRY
ACORN
GARBER
CHERRY
BLEK
RENDEZVOUS
PERKINS
HALCYON
TYRO
ALLURE
ANGEL CREEK
IRENIC
MUSE
ESPRIT
PLACID
TREK
STELLAR

2.1.5 Socio-Economic Conditions and Trends

The 2014 average Median Household Income (MHI) for Veneta was $45,705, which is higher than the Lane County MHI of $42,628 (Workshop, 2015). The state MHI was $50,036. The City of Veneta is composed of 1730 households.

The City of Veneta has similar poverty rates compared to the national average and the Oregon average. In 2013, the U.S. Census Bureau found that 14.4% of all people living in Veneta had incomes below the poverty level, compared to 20.0% in Lane County and 16.2% in Oregon. The percentage of people living in the United States below the poverty line in 2013 was 14.5% (Gabe, 2015).

Figure 2.1.5: Employment in Veneta



2.2 Physical Environment

2.2.1 Topography

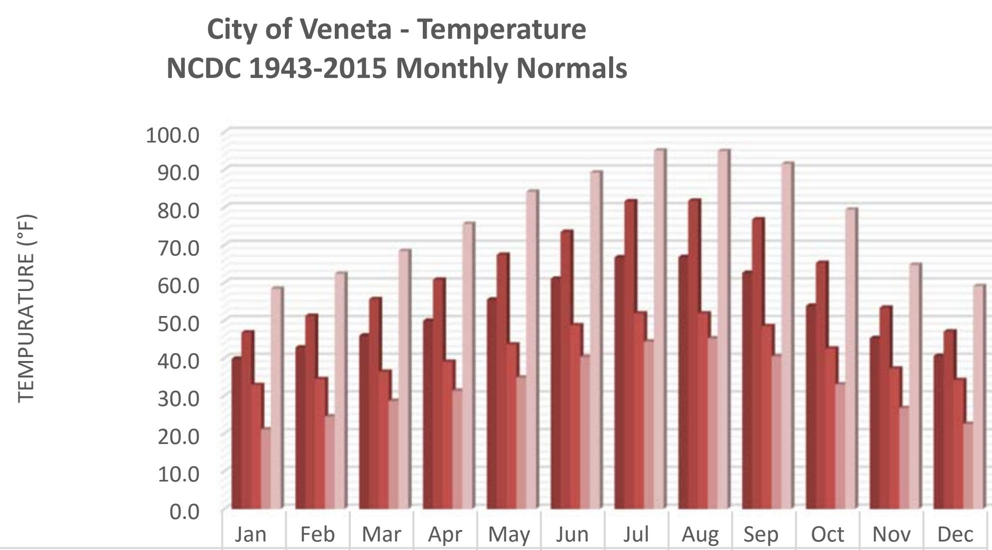
The topography of the area is such that highest elevations are along the southwestern City limits along the base of Bolton Hill which rises approximately 400' above the city. The rest of the City has relatively level ground. There is a small ridge that runs from the southwest side of town to the northeast side of town. This ridge bisects the town into an east side and a west side, requiring a pumping station in the east side to convey wastewater to the wastewater treatment plant on the west side of town.

2.2.2 Climate

Climate data was obtained using long-term records collected at the closest weather station, GHCND: USC00352867 located at the City of Veneta wastewater treatment plant, as reported by the National Oceanic and Atmospheric Administration (NOAA).

The average annual temperature in Veneta ranges from 46°F to 81°F with an annual mean of 63°F. A record high temperature of 108°F was recorded in August 2002. A record low temperature of -2.9°F was recorded in December 1972. July and August are statistically the warmest months with a mean of 81°F while December and January are the coldest with a mean of 47°F. Temperature normals are shown in Figure 2.2.2A

Figure 2.2.2A: Temperature Normals, WWCC 1943-2015

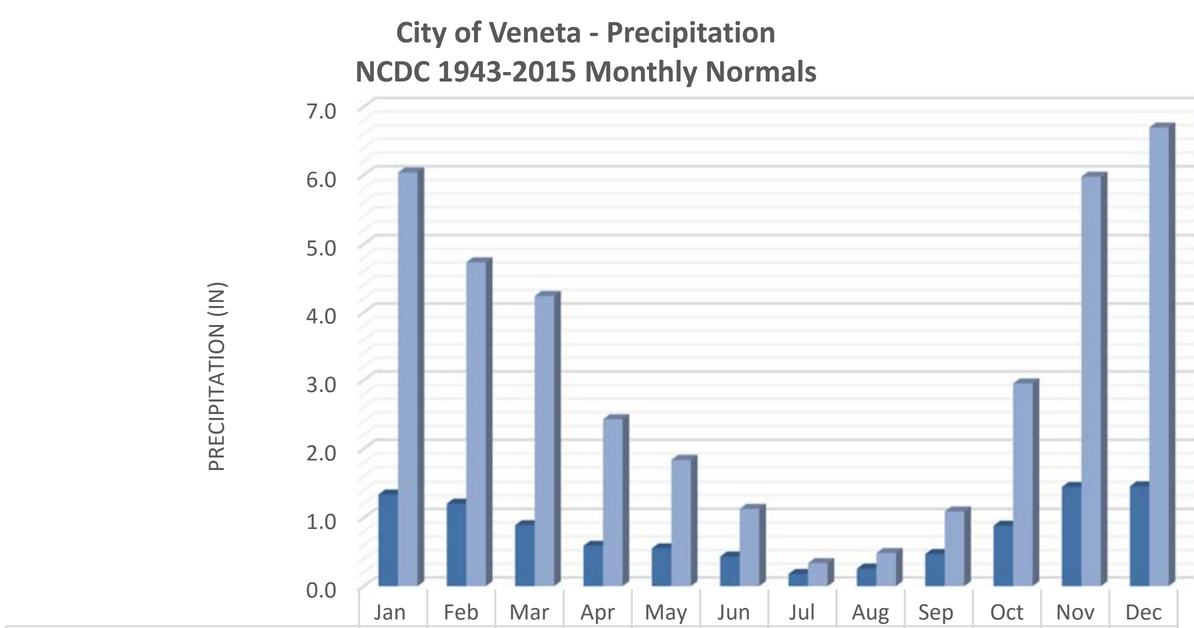


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly mean temperature	39.8	42.8	46.0	49.9	55.5	61.0	66.7	66.8	62.6	53.9	45.3	40.6
Monthly Mean maximum temperature	46.8	51.2	55.6	60.8	67.4	73.5	81.6	81.8	76.8	65.2	53.4	47.0
Monthly Mean minimum temperature	32.8	34.4	36.3	39.0	43.6	48.7	51.8	51.8	48.4	42.5	37.2	34.1
Extreme minimum daily temperature	21.1	24.5	28.6	31.3	34.8	40.3	44.4	45.2	40.4	33.0	26.7	22.5
Extreme maximum daily temperature	58.4	62.4	68.4	75.6	84.2	89.2	95.1	94.9	91.6	79.4	64.7	59.1

Average annual precipitation is approximately 41.18-inches in Veneta. Record low and high precipitation years recorded were 18.3-inches in 1991 and 67.1-inches in 2012. The maximum recorded 24-hour rainfall was 5.67-inches on November 19, 1996. On average, 46% of the annual precipitation occurs in December, January and February. Snowfall is minimal with most years recording little snowfall;

however, record snowfall of 30.9-inches was reported for the month of January in 1969. The mean annual snowfall during the period from 1943 to 2012 is 2.8-inches. Based on the NOAA Atlas 2, Volume X Isopluvial maps, the 5-year storm 24-hour rainfall is 4.2 inches. Precipitation normals from the NCDC are shown in Figure 2.2.2B

Figure 2.2.2B: Precipitation Normals, NCDC 1943-2015

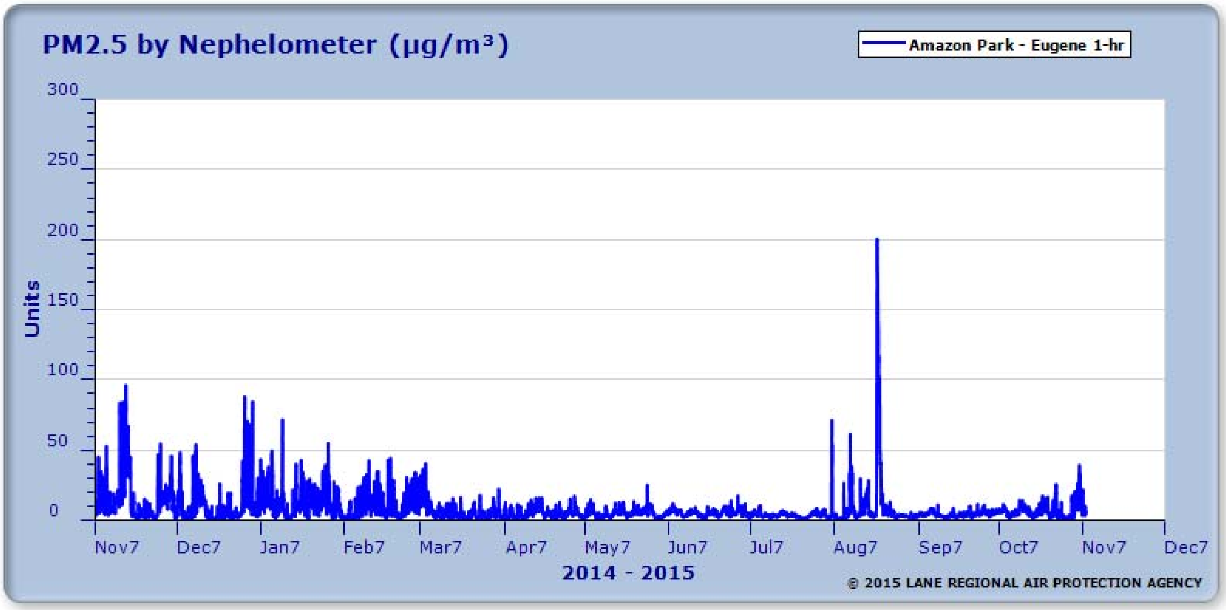


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Extreme Max Daily Precipitation	1.3	1.2	0.9	0.6	0.6	0.4	0.2	0.3	0.5	0.9	1.4	1.5
Total Precipitation	6.0	4.7	4.2	2.4	1.8	1.1	0.3	0.5	1.1	3.0	6.0	6.7

2.2.3 Air

The Air Quality Index (AQI) for Veneta has averaged 6.7 over the past 5 years where 0-50 is good air quality. The annual high was 35.5. The United States mean AQI is 42. Figure 2.2.3 is from the Lane Regional Air Protection Agency air quality monitoring site, DEQ#18524, EPA#410390060, and shows the AQI by each month for Eugene Oregon, only 14 miles from Veneta.

Figure 2.2.3: Air Quality Index Graph



2.2.4 Soils

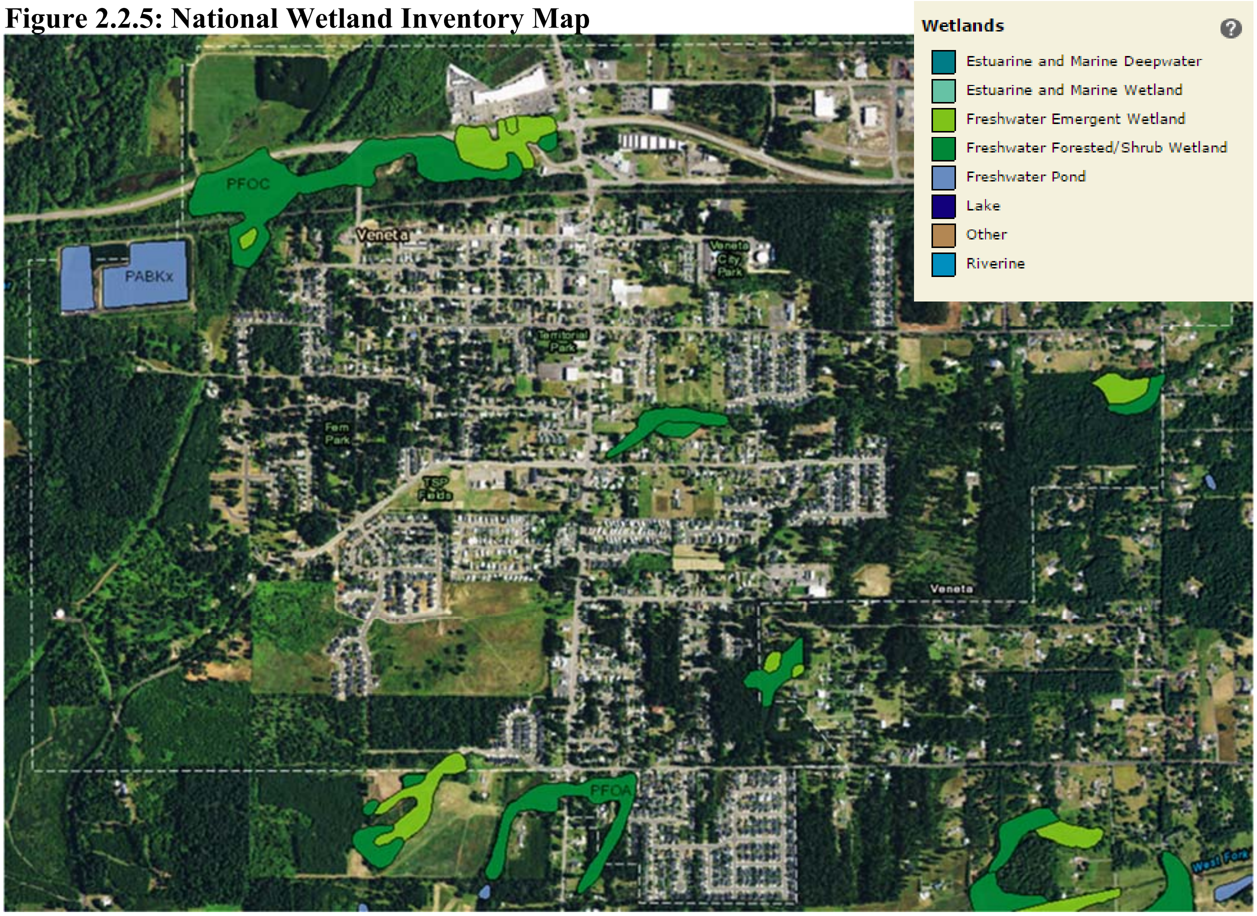
According to the 1997 Wastewater Facilities Plan the City of Veneta's predominate soil is McBee silty clay loam that is about 24" thick. This has a subsoil of mostly silty loam about 17" thick with moderate permeability.

A Linslaw loam and Salkum silty clay loam are the other soils found in the area around the Long Tom River, also there is a Dupee silty loam and a Bellpine silty clay loam around the Bolton Hill area.

2.2.5 Wetlands

The National Wetlands Inventory lists seven wetlands within city limits, it should be noted that there are many more undocumented wetlands. The largest is located along the Long Tom River on the north end of the city. Smaller wetlands are located throughout the city. The wetlands fall in to one of two categories: Freshwater Emergent and Freshwater Forested/Shrub. A map of the wetlands is shown in Figure 2.2.5.

Figure 2.2.5: National Wetland Inventory Map



2.2.6 Water

The City provides potable water service to all areas within the current City limits and Urban Growth Boundary (UGB). The City's source for water comes from three deep wells that are augmented with finished water purchased directly from EWEB (Eugene Water & Electric Board).

2.2.7 Environmentally Sensitive Areas

In discussion with the City, it was noted that there is a stand of an endangered herb, Lomatium bradshawii, located just west of the "Welcome to Veneta" sign located on Territorial Hwy on the north end of town. It should be noted that if construction is necessary near this area for wastewater system improvements, it would be necessary to perform both archeological and biological surveys to ensure that no impacts to possible historical sites or threatened/endangered species occur.

2.2.8 Coastal Resources

The City of Veneta is not located within the coastal zone.

2.2.9 Flooding

The City of Veneta has areas defined on FEMA maps as susceptible to flooding in a 100-year flood event. This area is limited primarily to the southeastern side of the river. However, FEMA has mapped the site with an "un-numbered 'A' zone. An un-numbered 'A' zone designation means that FEMA has not done a detailed study to estimate and assign an actual flood elevation for the 100-year floodwater surface. See the zoning map on page 11 for flood hazard details.

2.3 Population

The population in the City of Veneta grew quickly during the first decade of the 21st century with growth rates that were previously unprecedented. The year 2005 marked a high with an 8.31% growth rate. Since that time the growth of the City has decreased significantly compared with the previous decade, but has continued to show a positive growth rate.

2.3.1 Historic Growth Rate

Historic population data is based on U.S. Census data. The following table displays the historical population for the City of Veneta (United States Census Bureau, 2015).

Table 2.3A: Historical Population Growth, the City of Veneta

City of Veneta - Historic Population & Annual Growth Rates						
Year	1990	1995	2000	2001	2002	2003
Population	2489	2698	2771	2787	2846	2958
Annual Growth Rate	0.00%	1.41%	0.32%	0.57%	2.07%	3.79%
Year	2004	2005	2006	2007	2008	2009
Population	3189	3478	3766	4088	4247	4400
Annual Growth Rate	7.24%	8.31%	7.65%	7.88%	3.74%	3.48%
Year	2010	2011	2012	2013	2014	2015
Population	4571	4602	4632	4657	4690	4721
Annual Growth Rate	3.74%	0.67%	0.65%	0.54%	0.70%	0.66%

This report is intended to provide the City with pertinent planning information through the year 2036. Forecast trends for Lane County anticipate a growth in the county population of more than 152,400 persons by the year 2065. This would result in a total population of 513,982 equaling a 42% increase. This increase is based on the assumption that Lane County would continue to enjoy a positive economic atmosphere. The forecasted growth rate is expected to be the highest in the current term (2015-2035).

The City of Eugene is one of the two largest UBGs in the county and is expected to have an average annual growth rate (AAGR) of 1.0% from 2015-2035. The City of Veneta sits in the shadow of the Eugene/Springfield area as a bedroom community with many enticing amenities. It is expected that Veneta, due to its appeal as a family community and the convenience of its proximity to Eugene/Springfield, would also have a sustained growth during this period with an AAGR of 2.5%. (PSU Population Research Center, 2015)

Table 2.3B displays the anticipated growth rate in the City and UGB during the planning period covered by this plan.

Table 2.3B: Veneta Population Projections (PSU Population Research Center, 2015)

Population Projections		
Year	Population	Ave. Annual Growth Rate
2015	4,721	
		3.88%
2020	5,752	
		2.10%
2025	6,397	
		1.90%
2030	7,042	
		1.74%
2035 [2]	7,687	

(1) Data based on The Coordinated Population Forecast for Lane County
(2) The year 2035 represents the end of the 20-yr planning period.

2.3.1 2009 vs Current Planning

2009

Although the City experienced rapid growth from 2004 to 2007 it has since slowed significantly. As shown in the Historical Population growth of Table 2.3A the growth of the City slowed considerably after 2010. While remaining positive, the City's AAGR has been just over 0.50%.

The forecasted 2030 population from the 2009 Wastewater System Master Plan and Capital Improvement Plan was 9960 persons. This number was based on the 2004 adopted forecast for the year 2030 from the Lane Council of Governments estimate.

Current

Pushing the population forecast to 2036, we see an estimated population of 7,795, which is still only 78% of the 2009 report's 2030 projection. In light of the diminished population growth that the City has seen since the report was done in 2009, many of the upgrades in the 2009 Wastewater Master Plan may be scheduled much sooner than are actually necessary.

This change in total population projection would play a significant role in planning. The overall affects will be discussed in Sections 4 and 5.

3 Existing Wastewater Facilities

3.1 Service Area

The City of Veneta's wastewater treatment plant currently services most of the developed area within the urban growth boundary, with the exception of a small percentage of homes on the easternmost side of the town. Due to the limited scope of this report a full analysis of the collection system was not performed. Information regarding the current state of the collection system was obtained from the 2009 WWMP and as reported by City staff.

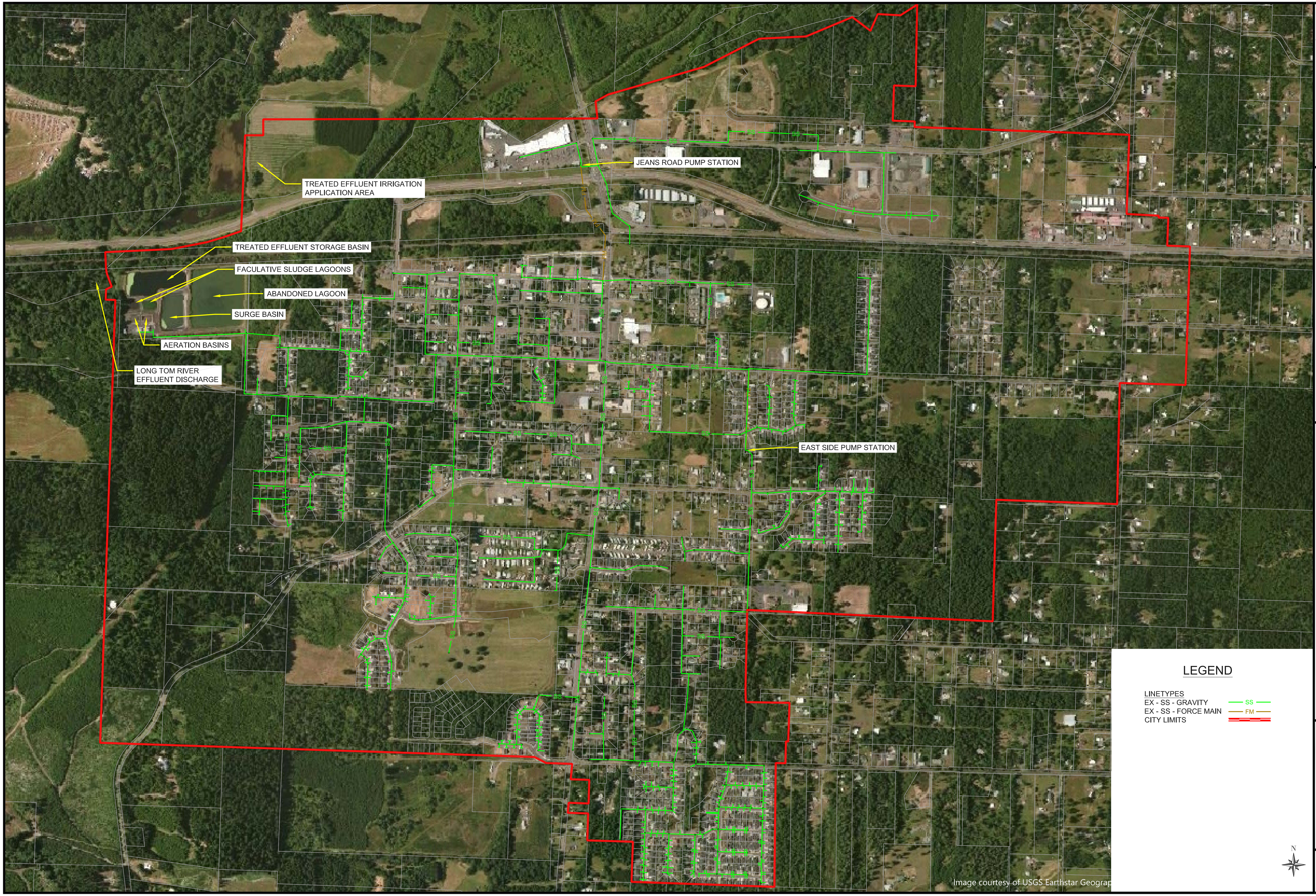
The City of Veneta's Wastewater Facilities include approximately:

- 60,580 linear feet of gravity sewer main
- 413 Manholes
- 2 Wastewater lift stations
- 2,200 linear feet of pressure force main
- Wastewater Treatment Plant including;
    - Surge Basin
    - Influent lift station
    - Headworks screen
    - 2 aeration basins/clarifiers
    - UV disinfection system
    - Sludge Basin
    - Effluent holding pond and irrigation system
    - 700 linear feet of 18" ductile iron effluent discharge pipe to the Long Tom River

The City of Veneta's wastewater facility currently provides services to most of the developed area within the City limits and the UGB. The City's Wastewater Facilities Plan is shown in Figure 3.1A and the Overall Sewer Basin Map is shown in Figure 3.1B.

3.2 History

The City of Veneta was incorporated in 1962 and the first wastewater collection system was completed in 1972 and the first wastewater treatment plant was completed in 1979. Throughout the following 21 years, expansions to the collection system were made as the City continued to grow. In March of 2000 the City began construction on a new wastewater treatment facility based around the Biolac treatment process. Recent upgrades to the facility have included an expansion of the UV disinfection facilities and installation of a new headworks screen. The most recent improvements have included the replacement of the air piping for the aeration basins, which were installed in open trenches for maintenance access.



Civil West Engineering Services, Inc.

CITY OF VENETA
LANE COUNTY, OREGON

WASTEWATER FACILITIES PLAN

CITY MAP

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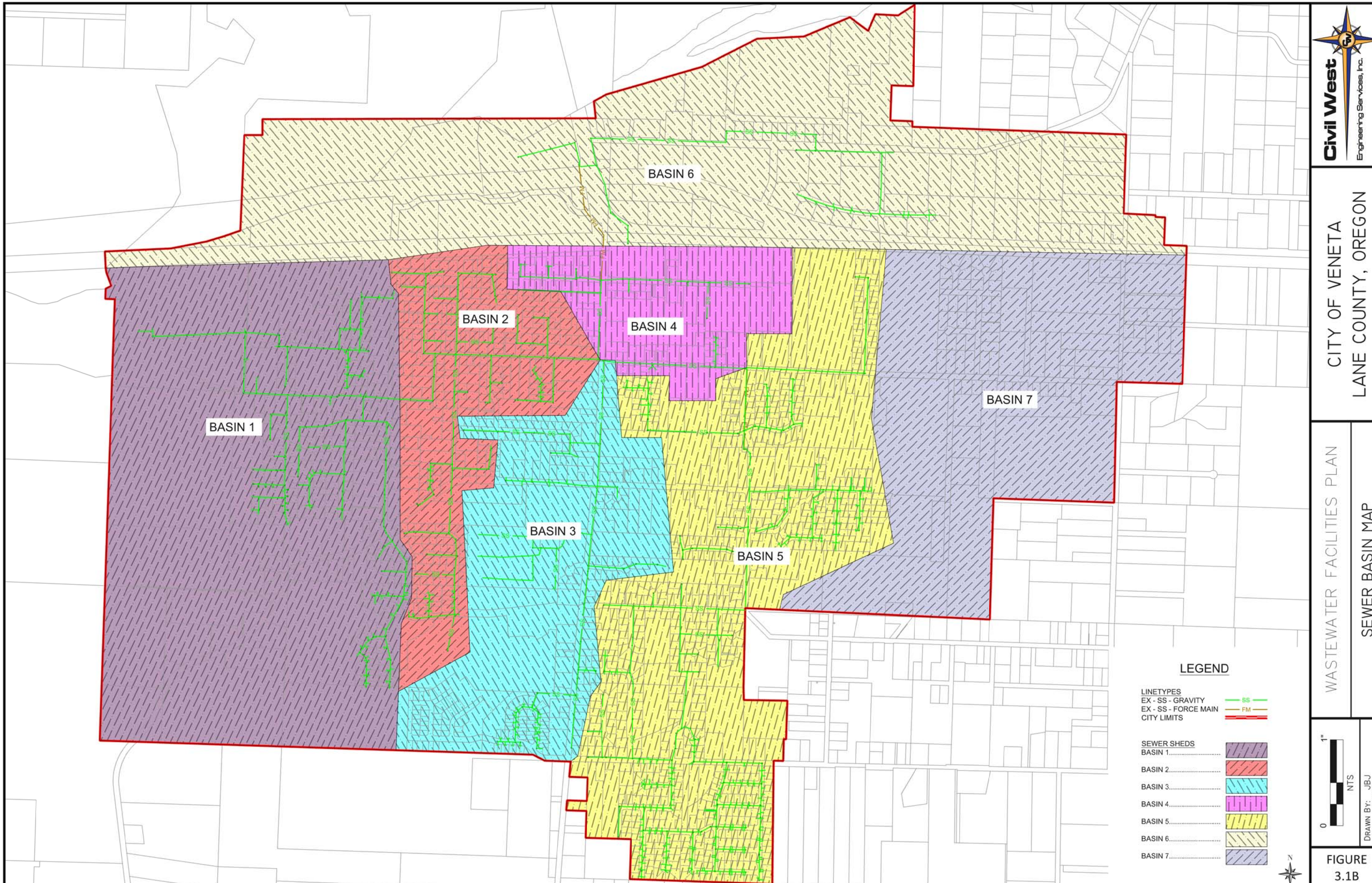
DRAWN BY: JBJ
DATE: JAN 2016

FIGURE 3.1A


BASIN 1
BASIN 2
BASIN 3
BASIN 4
BASIN 5
BASIN 6
BASIN 7
LEGEND
LINETYPES
EX - SS - GRAVITY
EX - SS - FORCE MAIN
CITY LIMITS
SS
FM
SEWER SHEDS
BASIN 1
BASIN 2
BASIN 3
BASIN 4
BASIN 5
BASIN 6
BASIN 7
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Civil West
Engineering Services, Inc.
CITY OF VENETA
LANE COUNTY, OREGON
WASTEWATER FACILITIES PLAN
SEWER BASIN MAP
0
1"
NTS
DRAWN BY: JBJ
DATE: JAN 2016
FIGURE
3.1B

3.3 Collection System Infrastructure

Veneta's collection system consists of several gravity networks and two lift stations.

Per the 2009 Wastewater Master Plan, the gravity system contains over 60,000 feet of sloped pipe. Over half of the gravity pipe is the original asbestos cement piping that was used when the collection system was built in 1972. Later expansions and upgrades to the system were built using PVC, most recently the size upgrade of 2,290' of 8" asbestos concrete pipe running under Territorial Highway. See Table 3.3.

Table 3.3: Collection System Pipe Size and Age Summary

Pipe Type, Size and Age Summary			
Type	Size	Age	Quantity (feet)
Asbestos Concrete*	8"	~45 years	36,000
Asbestos Concrete*	12"	~45 years	900
Asbestos Concrete*	15"	~45 years	1,500
Asbestos Concrete*	18"	~45 years	1,400
Asbestos Concrete*	21"	~45 years	1,600
PVC	8"	~30 years to present	12,000
PVC	10"	~30 years to present	2,500
PVC	12"	~30 years to present	1,000
PVC	15"	~30 years to present	500
PVC	21"	~30 years to present	1,700
PVC	27"	~30 years to present	1,400
		Total:	**60,500**

*Note: Some of the original asbestos concrete pipe throughout the town has been replaced with PVC for either capacity upgrades or I/I abatement projects.

The following sections define the sewerage basins within the City. The boundaries between basins are based on both topography and the existing collection system.

3.3.1 Basin 1

Basin 1 covers the west end of the City, it is about 65% developed. Mostly the slopes of Bolton Hill in the southern part on Basin 1 remain undeveloped. Currently, all of the flows from the other basins flow through Basin 1 before reaching the wastewater treatment plant on the west side of the basin. See Figure 3.3.1.

3.3.2 Basin 2

Basin 2 is just to the east of Basin 1 and is about 90% developed. It also receives the flow from all of the other basins in town except for Basin 1. See Figure 3.3.2.

3.3.3 Basin 3

Basin 3 is southeast of Basin 2. Basin 3 is about 65% developed. Basin 3 connects to the central gravity system at Hunter Road and Territorial Highway. The southern half of Territorial Highway runs through Basin 3. See Figure 3.3.3.

3.3.4 Basin 4

Basin 4 is east of Basin 2 and services a roughly square area to the south of Highway 126 and to the east of Territorial Highway. Basin 4 is about 50% developed. Basin 4 is fed via force main from Basin 5. See Figure 3.3.4.

3.3.5 Basin 5

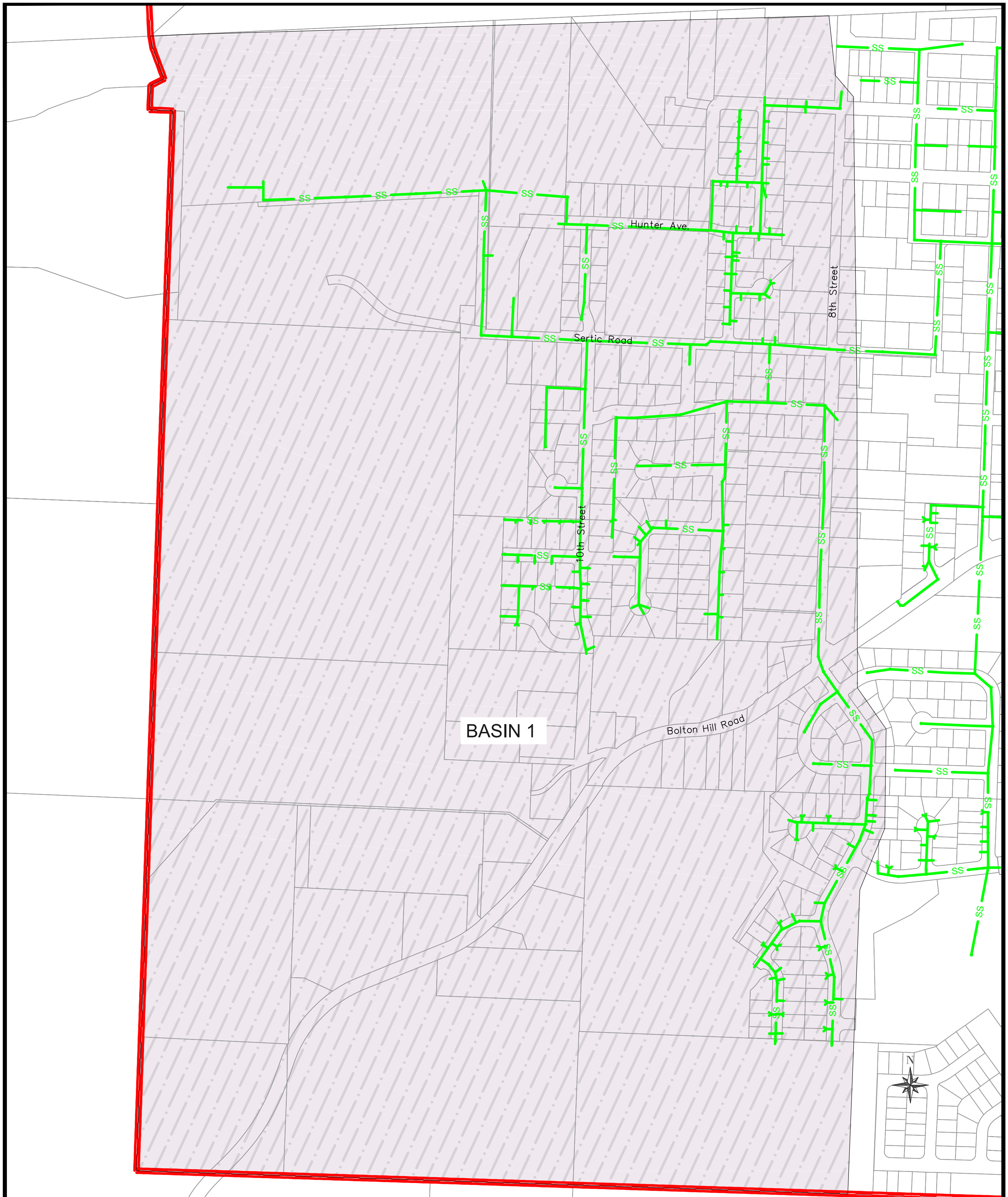
Basin 5 is south of Basin 4 and lays just east of Territorial Highway in the southern half of the town. Basin 5 is about 60% developed. See Figure 3.3.5.

3.3.6 Basin 6

Basin 6 is the whole area north of the railroad tracks, it runs from the west side all the way to the east side. Basin 6 is about 20% developed. Basin 6 is zoned for mainly commercial development. There appears to be ample space in Basin 6 for future development. See Figure 3.3.6.

3.3.7 Basin 7

Basin 7 is the remainder of the town to the east of Basin 4 and 5, and sits south of the train tracks and Basin 6. Basin 7 currently has no sewer service. Basin 7 has the greatest potential for growth and is about 20% developed. See Figure 3.3.7.



Civil West Engineering Services, Inc.

Drawn By: JBJ
Date: FEB 2016

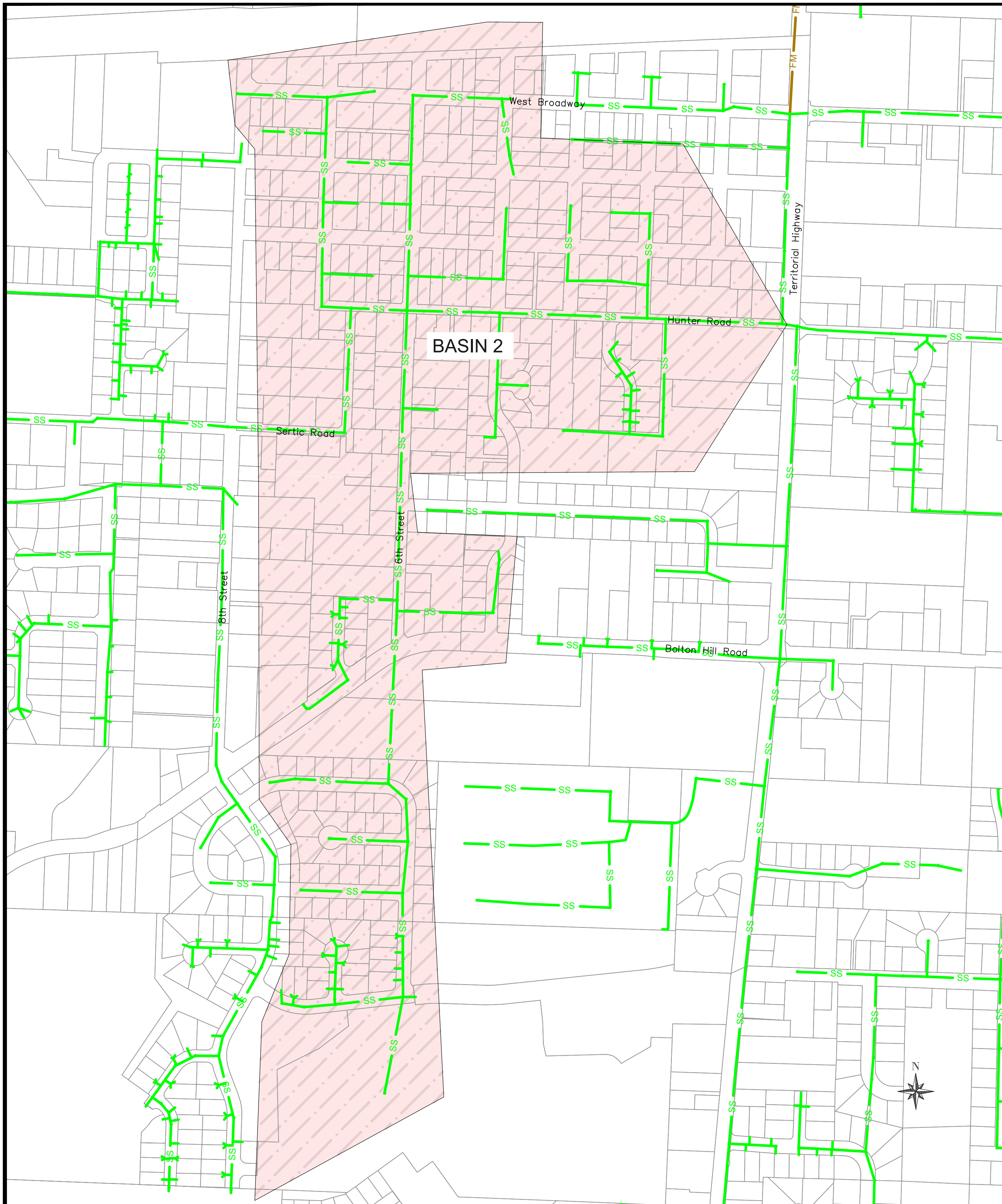
0 1"
NTS

BASIN MAP

FIGURE 3.3.1

WASTEWATER FACILITIES PLAN

CITY OF VENETA
LANE COUNTY, OR



Civil West Engineering Services, Inc.

DRAWN BY: JBJ
DATE: FEB 2016

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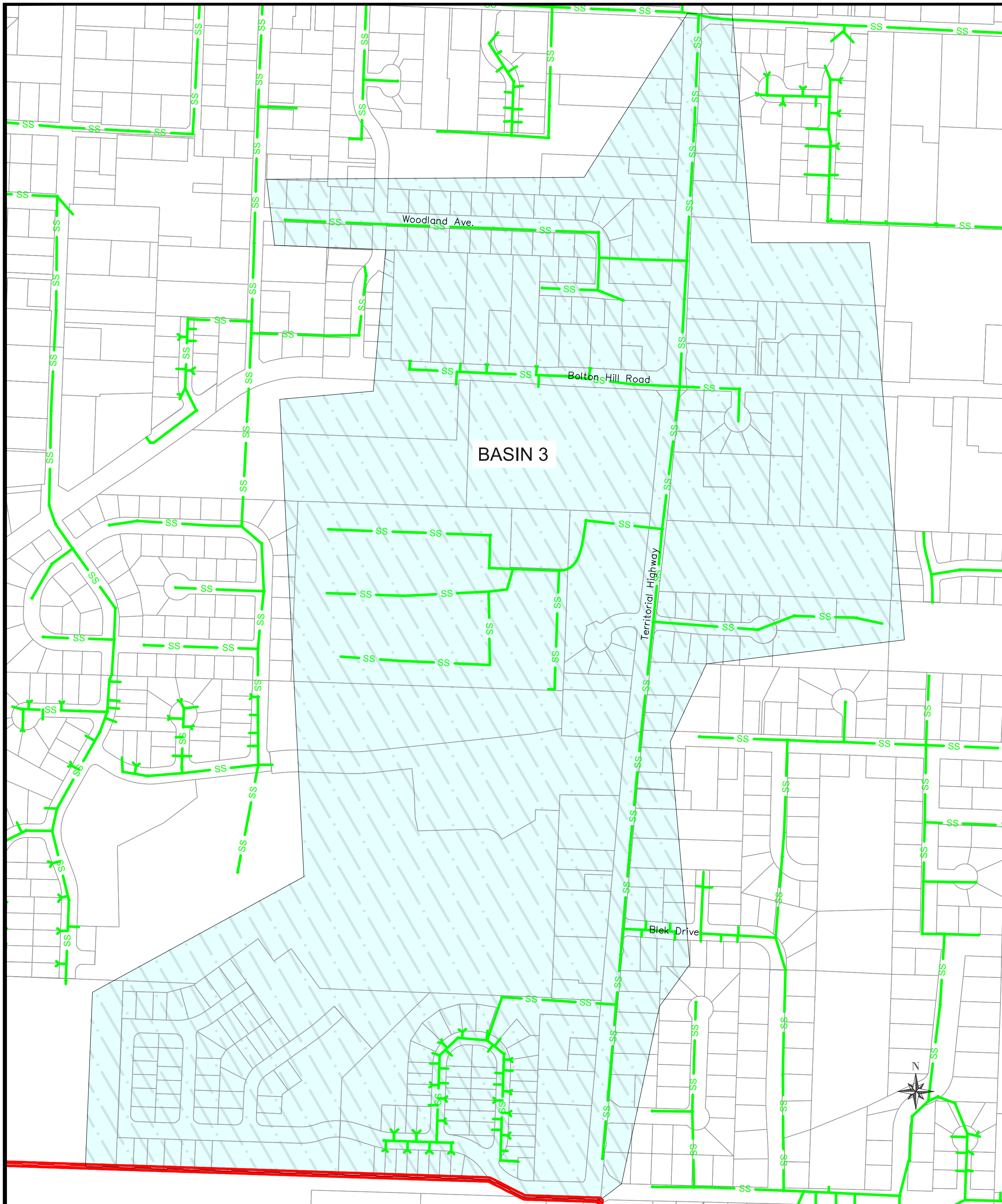
BASIN MAP

FIGURE 3.3.2

WASTEWATER FACILITIES PLAN

CITY OF VENETA
LANE COUNTY, OR



Civil West Engineering Services, Inc.

DRAWN BY: JBJ
DATE: FEB 2016

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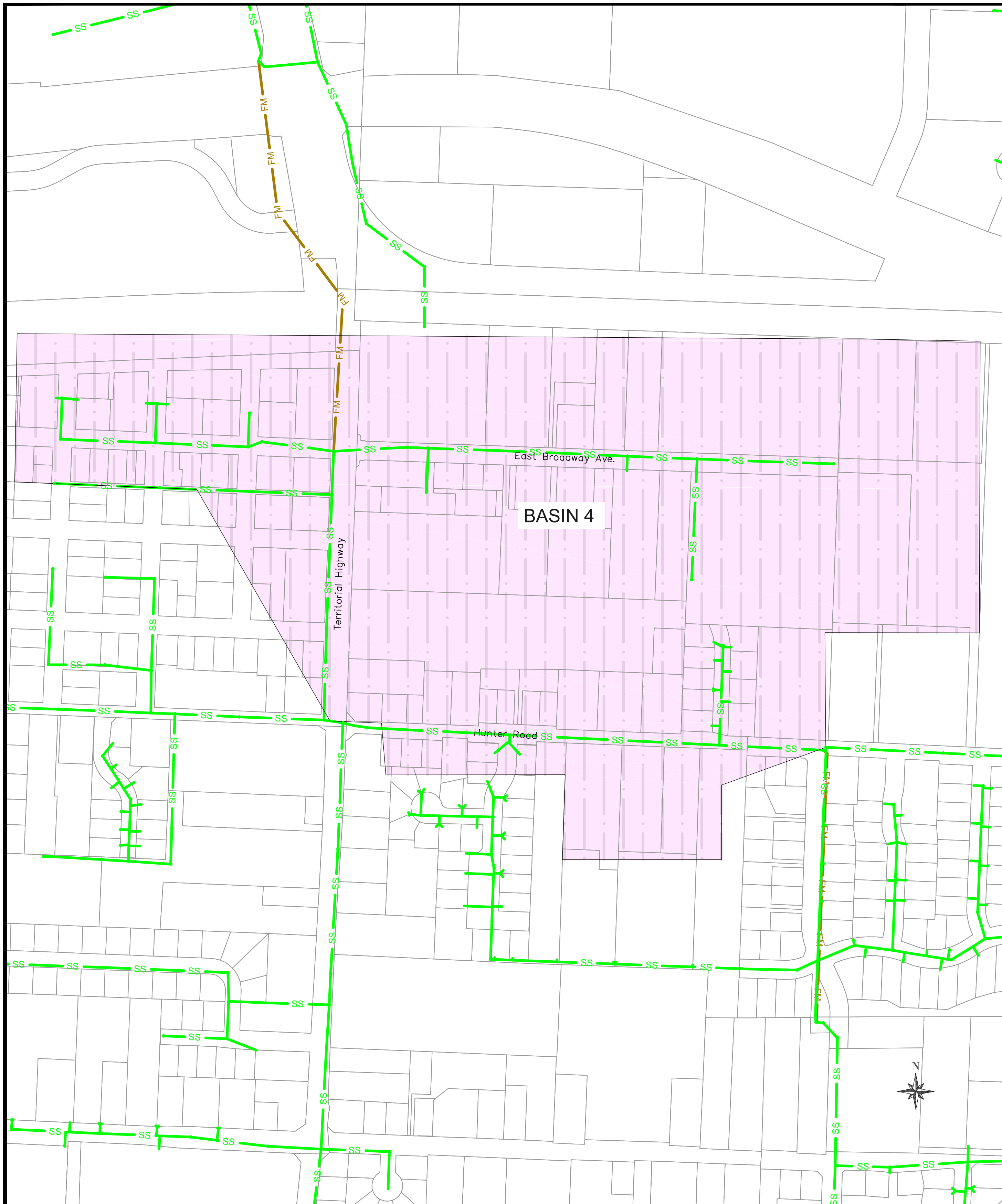
NTS

BASIN MAP

WASTEWATER FACILITIES PLAN

CITY OF VENETA
LANE COUNTY, OR

FIGURE
3.3.3



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Date: FEB 2016

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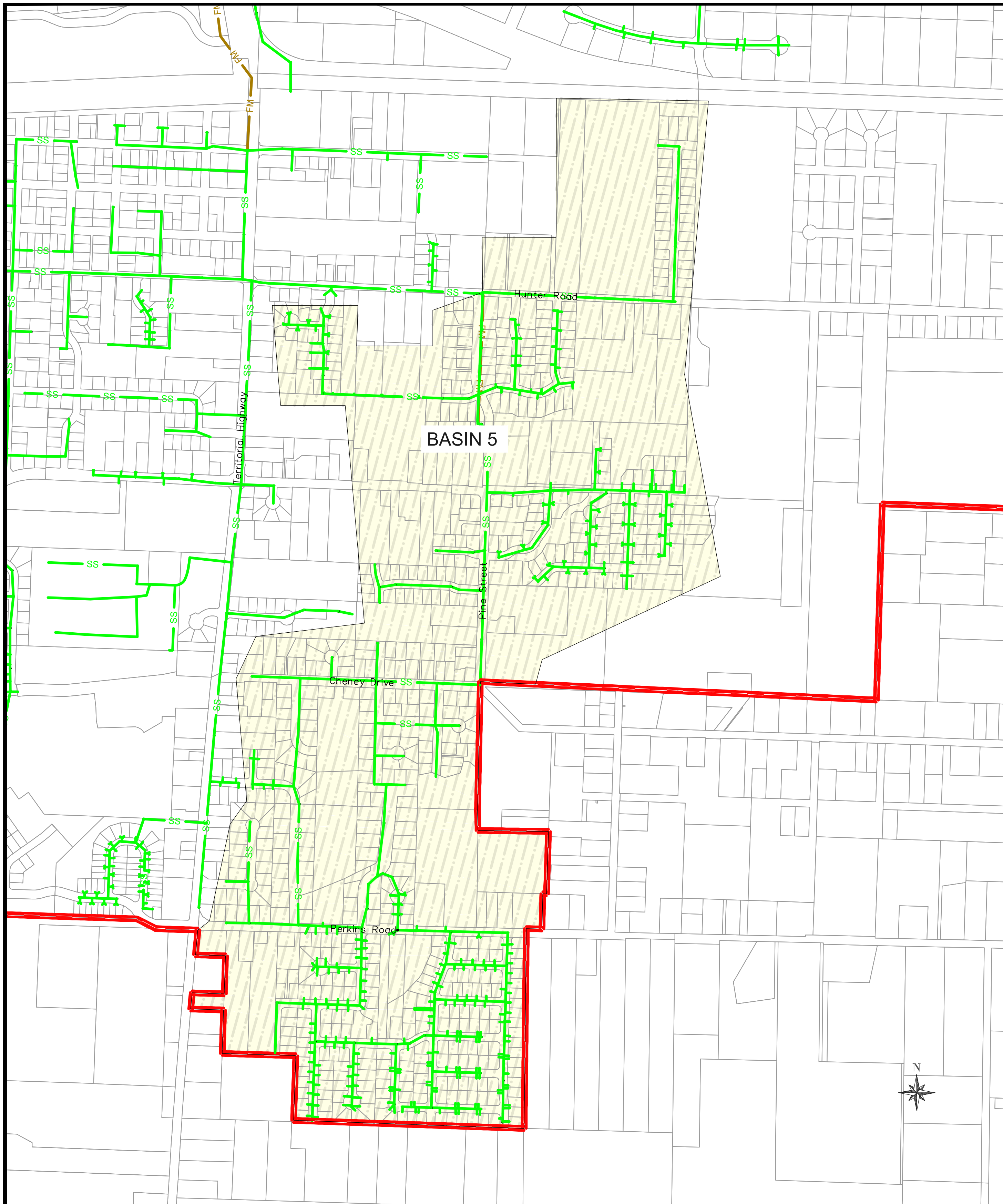
BASIN MAP

FIGURE 3.3.4

WASTEWATER FACILITIES PLAN

CITY OF VENETA
LANE COUNTY, OR



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DATE: FEB 2016

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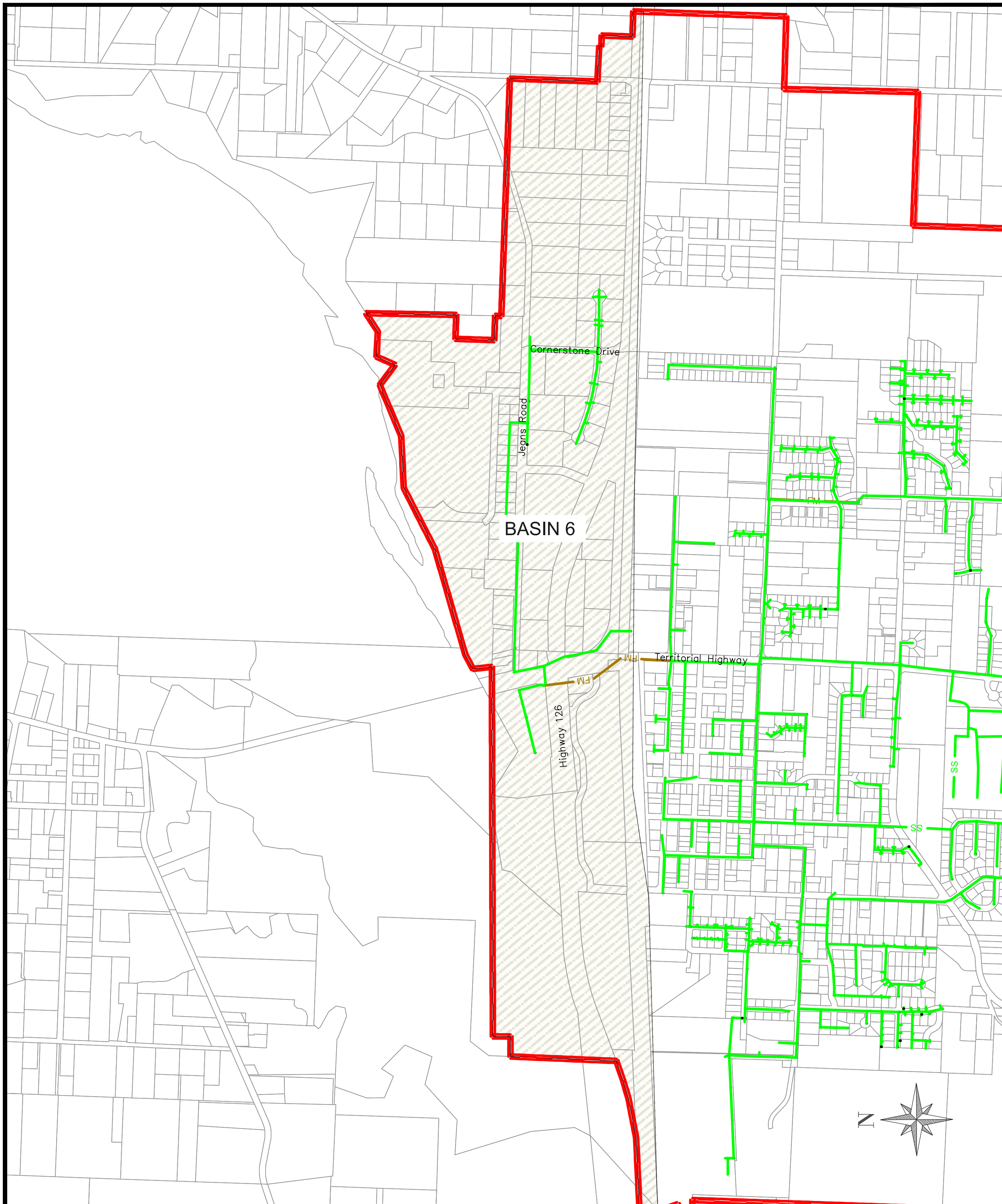
BASIN MAP

FIGURE 3.3.5

WASTEWATER FACILITIES PLAN

CITY OF VENETA
LANE COUNTY, OR



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DATE: FEB 2016

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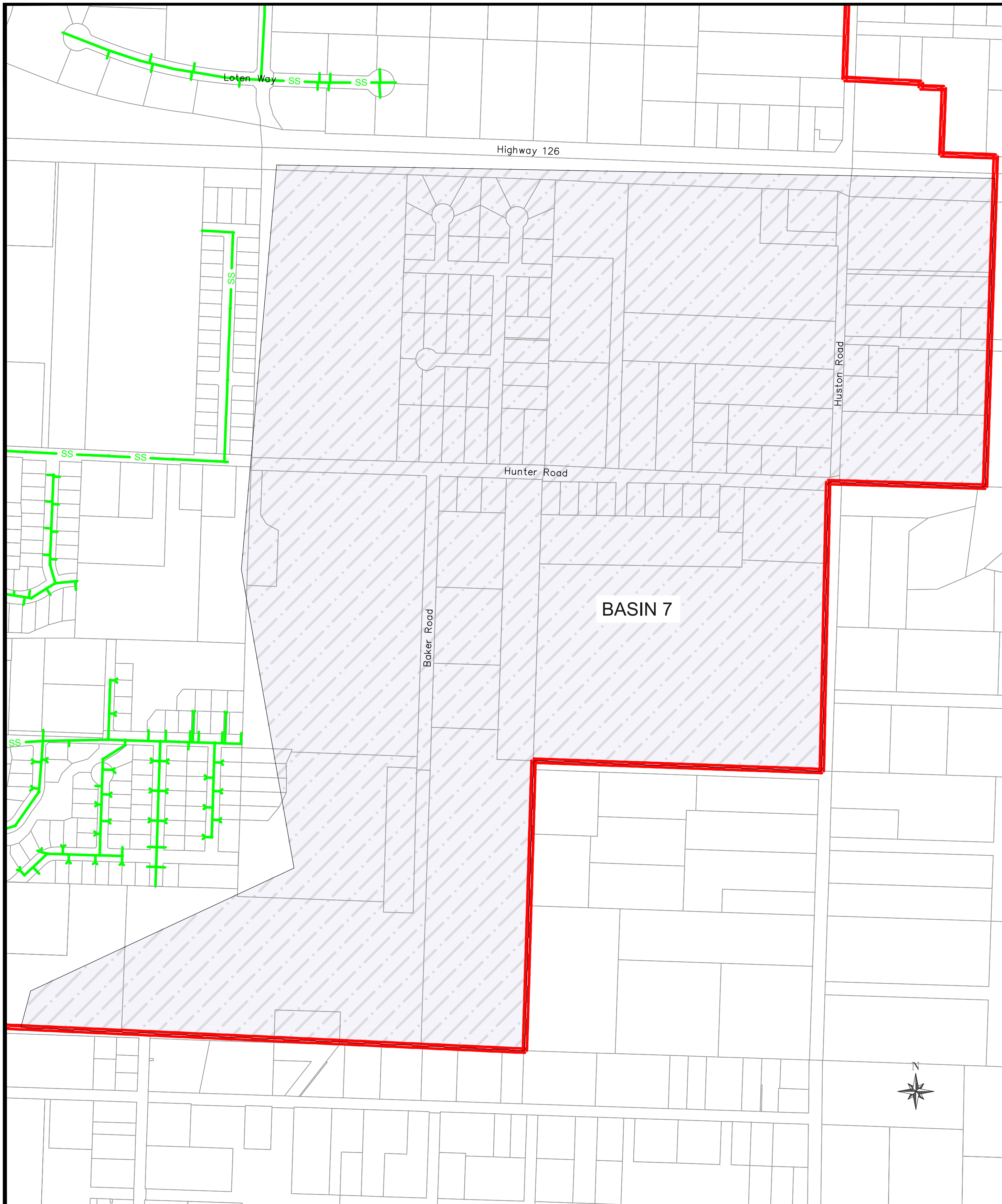
NTS

BASIN MAP

FIGURE 3.3.6

WASTEWATER FACILITIES PLAN

CITY OF VENETA
LANE COUNTY, OR



Civil West Engineering Services, Inc.

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DATE: FEB 2016

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NTS

BASIN MAP

FIGURE 3.3.7

WASTEWATER FACILITIES PLAN

CITY OF VENETA
LANE COUNTY, OR

3.3.8 Lift Stations

There are currently two lift stations, Jeans Road and Pine Street.

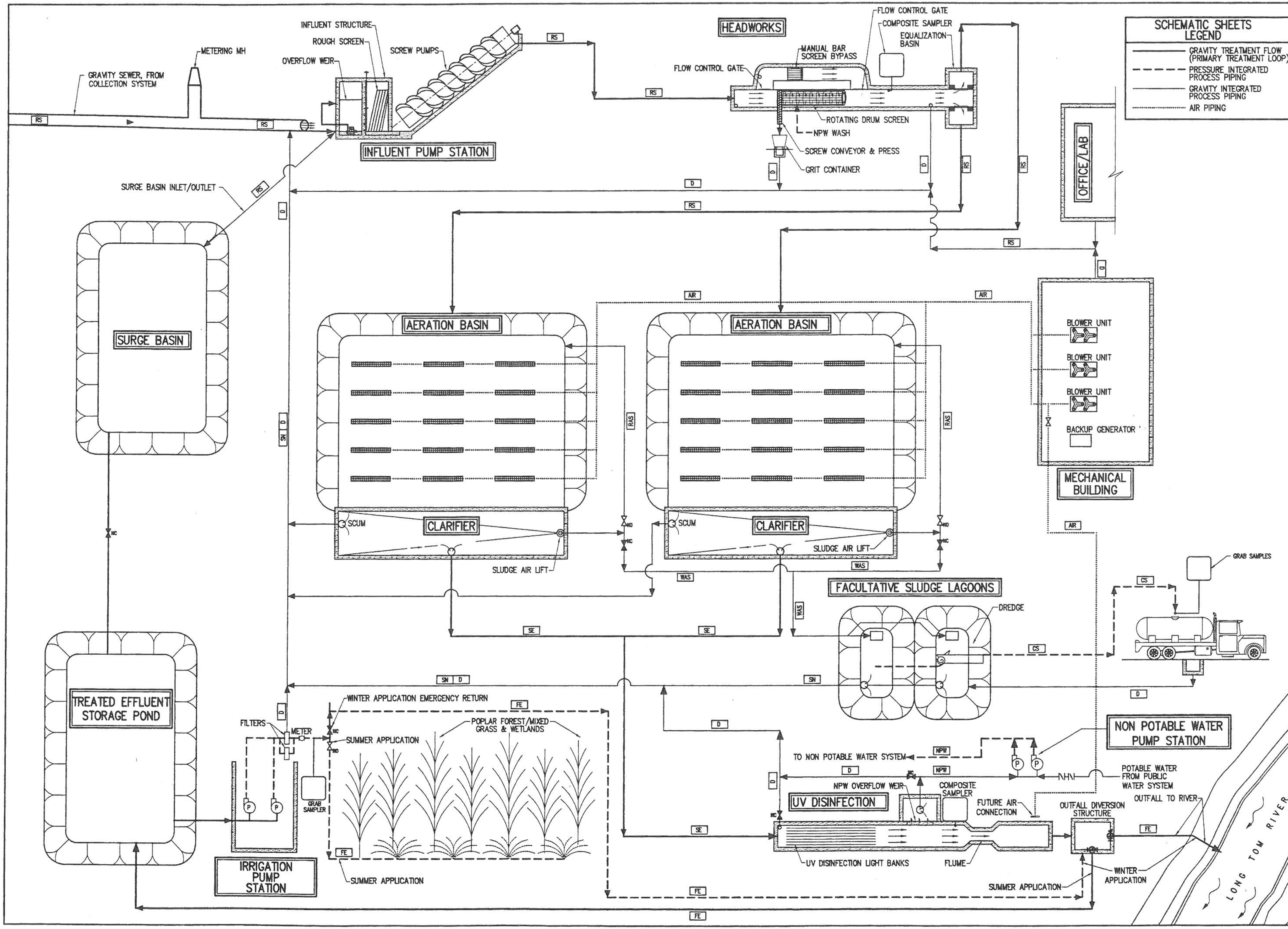
The Jeans Road lift station was built in 1988 and is located on the NW corner of Territorial Highway and Highway 126. It is a packaged wetwell, and is equipped with two dry mounted pumps. The pump motors are 460 V, three phase, constant speed and are rated at 10 hp. The lift station is able to deliver 130 gpm at 52' TDH per pump in the current configuration. This lift station does not have a dedicated source of auxiliary power, but, has a plug to attach a portable generator in the case of a power outage. This lift station runs ~1400' of 6" diameter asbestos concrete pipe running to the intersection of Broadway and Territorial Highway. Jeans Road lift station currently handles all of Basin 6.

The Pine Street lift station was built in 2001 and is located on the SW corner of Pine Street and Corky Lane. It two pumps mounted on grade with uplift intakes. The pump motors are 208 V, three phase, constant speed and are rated at 7.5 hp. The lift station is able to deliver 350gpm at 25' TDH per pump in the current configuration. This lift station runs ~900' of 10" ductile iron pipe to the intersection of Hunter Road and Pine Street where wastewater then flows by gravity down Hunter Road. Pine Street lift station currently handles all of Basin 5.

3.4 Wastewater Treatment Facilities

Veneta's first wastewater treatment system was completed in 1970. The wastewater treatment system consisted of a 3.86-acre single cell facultative lagoon and chlorination. Discharge during the winter was routed to the Long Tom River. In 1976 two facultative lagoons were built and the chlorination chamber was expanded.

In 2002 the existing wastewater treatment plant was built. The system has a firm design capacity of 1.25 MGD, matching the capacity of the screw type influent lift pumps feeding the headworks. Chlorination was removed and replaced with a low pressure UV disinfection system. A larger capacity expandable UV system was completed in 2012 with the older system retained for redundancy. See Figure 3.4.1 on the next page for the process schematic.



REGISTERED PROFESSIONAL ENGINEER 17,117 OREGON MAY 11, 1994 JERRY T. ELLIOTT

SYSTEMS WEST ENGINEERS, INC.
1600 Valley River Drive Eugene, Oregon 97401
Suite 310 • Phone (541) 342-7210 • Fax (541) 342-7220

CITY OF VENETA
WASTEWATER TREATMENT SYSTEM IMPROVEMENTS
LANE COUNTY OREGON

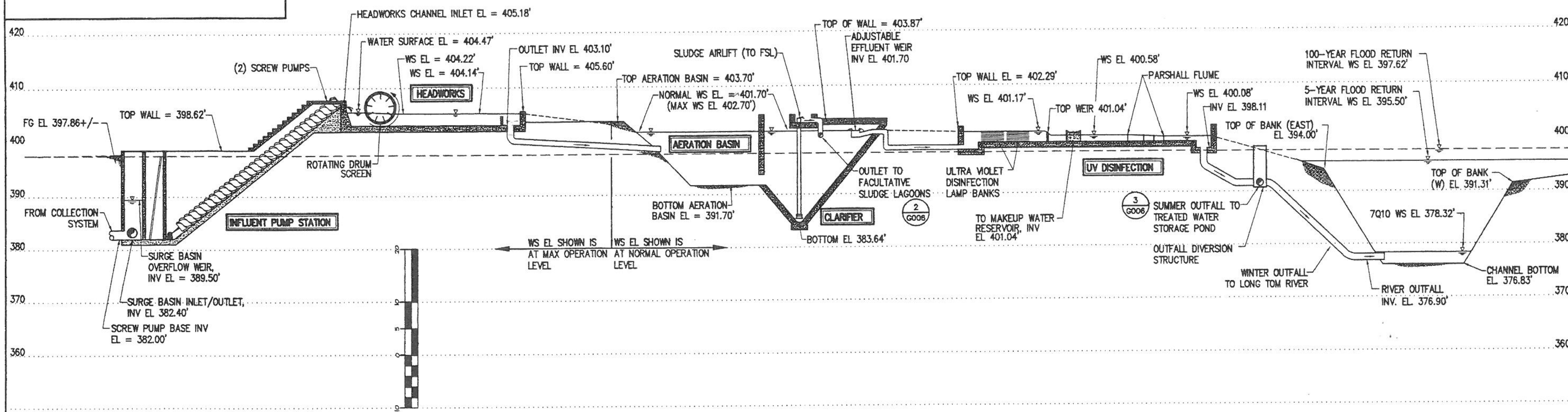
PROCESS SCHEMATIC

DESIGNED	JSA
DRAWN	JSA
CHECKED	
SCALE	AS SHOWN
DATE	MAR 2000
PROJECT	3033.20

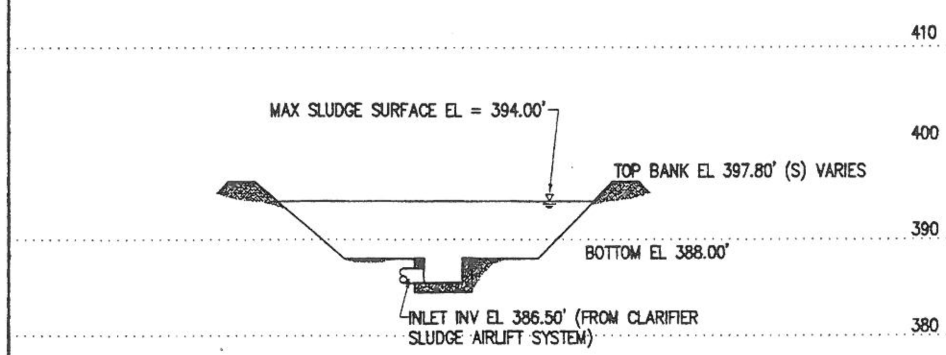
G005

LEGEND

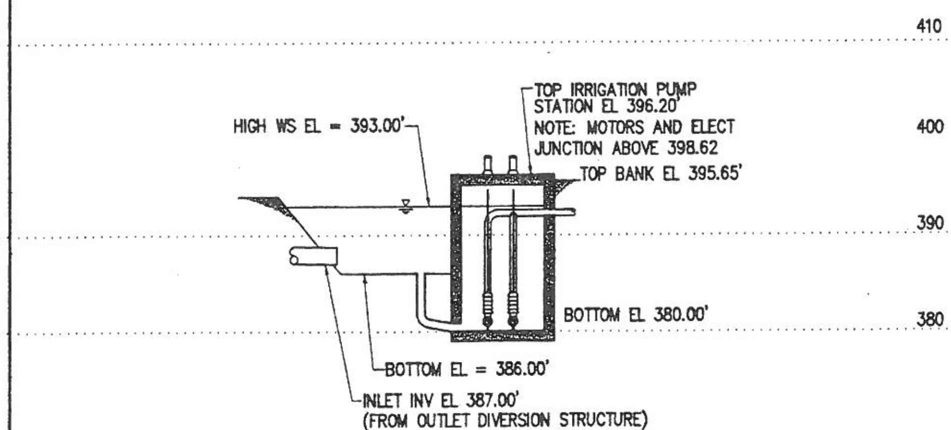
- - - - - - - - HYDRAULIC GRADE LINE = 1.25 MGD
— — — — — 100 YEAR FLOOD INTERVAL ELEVATION
· · · · · · · · GRID LINE



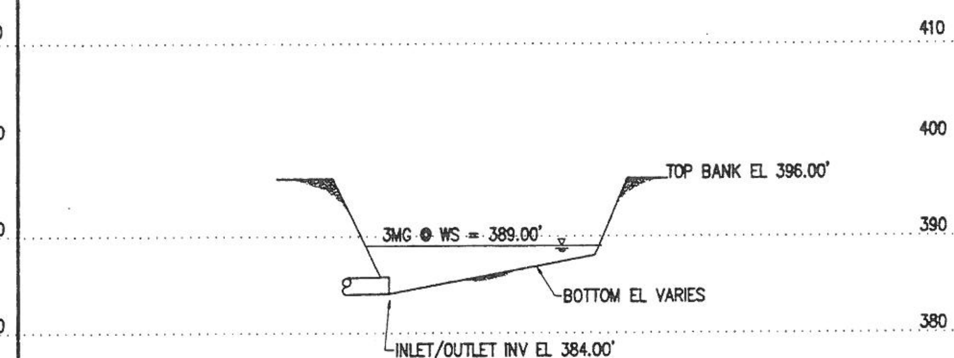
WWTP HYDRAULIC PROFILE — 1
SCALE: HORZ.: NTS
VERT.: 1" = 10'



FACULTATIVE SLUDGE LAGOON — 2
SCALE: HORZ.: NTS
VERT.: 1" = 10'



TREATED WATER STORAGE POND — 3
SCALE: HORZ.: NTS
VERT.: 1" = 10'



SURGE BASIN — 4
SCALE: HORZ.: NTS
VERT.: 1" = 10'

REGISTERED PROFESSIONAL ENGINEER 17117 OREGON MAY 11, 1984 JERRY T. ELLIOTT EXPIRES 12-31-01

SYSTEMS WEST ENGINEERS, INC.
1600 Valley River Drive, Suite 310 • Phone (541) 342-7210 • Eugene, Oregon 97401 • Fax (541) 342-7220

CITY OF VENETA
WASTEWATER TREATMENT SYSTEM IMPROVEMENTS
LANE COUNTY OREGON

SYM	DATE	REVISION	DWN	CHKD

HYDRAULIC PROFILE

DESIGNED JSA
DRAWN JSA
CHECKED
SCALE AS SHOWN
DATE MAR 2000
PROJECT 3033.20

G006

SHT 7 OF 127

3.4.1 Influent Lift Station

The influent lift station uses two 1.25 million gallon per day Archimedes type screw pumps. The screw pumps pump from an influent structure that has a provision for redirecting flows greater than 1.25 MGD to the adjacent surge basin. To meet redundancy requirements, the lift station is rated at 1.25 MGD.

3.4.2 Surge Basin

The wastewater treatment plant includes a 4-million-gallon surge basin that is connected to the influent structure with an overflow weir. Flows in excess of 1.25 MGD are directed to the surge basin for retention. When the influent flow decreases below 1.25 MGD, the flow to the surge basin reverses and is sent back to the influent lift station. Using the surge basin for large flows has worked well for the City, but it has limited capacity. Assuming a peak day flow occurring at the end of a peak week that also happens during a maximum month, flows could potentially compound and overcome the capacity of the surge basin as soon as 2026, or once the population reaches 6200.

3.4.3 Headworks

The headworks has a design flow of 1.25 MGD, and a two-way splitter.

3.4.4 Biolac Aeration Basins

The wastewater treatment plant uses two Biolac aeration basins for sedimentation and secondary treatment. Each Biolac basin is designed to handle a peak flow of 1.25 MGD. Each basin is design rated to handle 143 mg/L of BOD at a 0.92 MGD flowrate, or 1243 lbs./day. The Biolac system employs an integrated clarifier built into each aeration basin.

3.4.5 Facultative Sludge Lagoons

There are two lined, 460,000-gallon facultative sludge lagoons, approximately 16,000 square feet in area each. Their operating depth is 5.5’ with a maximum depth of 6.5’. The ponds are designed to handle 20 lbs. VSS per 1,000 square feet per day. For both ponds, this calculates out to 640 lbs. of VSS per day. The facultative sludge lagoons are located just north of the current Biolac aeration basins.

3.4.6 UV Disinfection

The current UV disinfection system was upgraded in early 2012 expanding the firm design capacity from 1.25 MGD to 2.80 MGD with the capability for expansion to 6.88 MGD. With expansion, the UV system is more than capable of handling current and projected peak flows.

3.4.7 Treated Effluent Storage

Treated effluent is stored in a lined, 7-million-gallon storage pond located north of the facultative sludge lagoons.

3.4.8 Irrigation Lift Station

Treated wastewater is pumped for reuse during the summer months from the irrigation lift station to grass fields north of the wastewater treatment plant.

3.4.9 Effluent Outfall

Treated effluent is discharged through an open ended 18” ductile iron pipe. It is approximately 150’ long and runs from the outfall diversion structure to the Long Tom River. The NPDES permit allows discharge to the river only during the period of October 1st through May 31st. During the period of June 1st through September 30th, the valve to the Long Tom River outfall is closed. Excess effluent during the summer months is stored in the effluent storage pond, which feeds the irrigation lift station used for irrigation of the grass fields north of the wastewater treatment plant.

4 Wastewater Flows

4.1 Wastewater Volume

The City of Veneta's Wastewater Treatment Plant is unique in that a surge pond is employed prior to the headworks. The surge pond allows the plant a buffer to redirect a portion of peak flows that can be treated later when the flow has diminished. The capacity of the 1.25 MDG influent lift station regulates the flow through the plant, thus providing a more consistent flow, and increases the operational stability of the plant.

The location of the wastewater treatment plant flow measuring device is on the effluent side of the plant, and records the flow going through the plant. Flow data in the plant DMRs does not reflect "real time" flows coming in from the collection system due to the diversion of peak flows to the surge pond. This must be accounted for when making flow projections, as the data will show peak flows truncated by the maximum flow generated by the influent lift station.

4.1.1 Flow Definitions

Wastewater is typically described through flow and loading characteristics. Flow characteristics define the hydraulic volumes that the lift station and wastewater treatment plant experience and what they must be capable of processing. Loading characteristics describe what is in the wastewater (i.e. contaminants, waste products, chemicals, etc.) that must be substantially removed before the water can be discharged into the environment as effluent.

The following terms will be used in flow analysis and flow projections in this Study:

Dry Weather Period: Defined as the period when the precipitation and stream flows are low. This period is defined in the Oregon Administrative Rules (OAR 340-041-207) as May 1 through October 31.

Wet Weather Period: Defined as the period when stream flows, rainfall and groundwater levels are high. This period is defined in OAR 340-041-207 as November 1 through April 30.

Average Annual Flow (AAF): Total wastewater flow for an average 12-month period, from January 1 through December 31, divided by the total number of days in the year.

Base Sewerage: Average wastewater flow for the period between July 1 and September 31. This is used as a basis to calculate I/I.

Average Dry-Weather Flow (ADWF): Total wastewater flow for the dry-weather period divided by the number of days in the period.

Maximum Month Dry-Weather Flow (MMDWF): Total wastewater flow for the month with the highest flow during the dry-weather period, divided by the number of days in the month.

Average Wet-Weather Flow (AWWF): Total wastewater flow for the wet-weather period divided by the number of days in the period.

Maximum Month Wet-Weather Flow (MMWWF): Total wastewater flow for the month with the highest flow during the wet-weather period, divided by the number of days in the month.

Peak Day Average Flow (PDAF): Total flow for the day with the highest wastewater flow during the year.

Peak Week Flow (PWF): Average Daily Flow during the peak 7-day flow period.

Peak Instantaneous Flow (PIF): Flow for the highest peak of the year, expressed as a daily flow.
The following terms will be used in the statistical analysis of flow rates:

Ten-year Maximum Month Dry-Weather Flow ($MMDWF_{10}$): The monthly average dry-weather flow with a 10% probability of occurrence.

Five-year Maximum Month Wet-Weather Flow ($MMWWF_5$): The monthly average wet-weather flow with a 20% probability of occurrence.

Five-year Peak Day Average Flow ($PDAF_5$): The peak day average flow associated with a five-year storm event.

Five-year Peak Instantaneous Flow (PIF_5): The peak instantaneous flow during a five-year storm event.

The following terms will be used in the Inflow and Infiltration Analysis:

Base Infiltration Flow The base daily average flow in the wastewater collection system due to inflow and infiltration. It is calculated by subtracting the base sewer flow rate from the average dry-weather flow.

Average Wet-Weather Inflow and Infiltration Flow (AWW I/I) The daily average flow in the wastewater collection system due to inflow and infiltration. It is calculated by subtracting the base sewer flow rate from the average wet-weather flow.

Maximum Monthly Wet-Weather Inflow and Infiltration Flow (MMWW I/I) The average daily flow during the maximum monthly occurrence in the wastewater collection system due to inflow and infiltration. It is calculated by subtracting the base sewer flow rate from the system maximum monthly wet-weather flow.

Peak Day Inflow and Infiltration Flow (PD I/I) The maximum daily flow in the wastewater collection system due to inflow and infiltration. It is calculated by subtracting the base sewer flow rate from the system peak daily average flow.

Peak Instantaneous Inflow and Infiltration Flow (PIF I/I) The peak instantaneous or peak hourly flow in the wastewater collection and wastewater treatment system due to inflow and infiltration. It is calculated by subtracting the base sewer flow rate from the system peak instantaneous flow.

4.1.2 Municipal Wastewater - Summary of Available Data

Effluent flow data obtained from the Discharge Monitoring Reports (DMRs) from January 2010 through October of 2015 have been used for flow analysis and wastewater characteristics. Flow calculations were calculated on an average across the six years of available data.

Daily rainfall totals were also referenced from the Wastewater Treatment Plant DMRs.

Based on the DMR data described above, some of the current design flows can be calculated. Since the data being used represents multiple years the time period in each of the following equations must be multiplied by the total number of years represented by the data set. In this case from 2010 to 2015, or six years. Below is the calculation AAF, Base Sewerage, ADWF, and AWWF:

$$AAF = \frac{Total\ Wastewater\ Flow}{Days\ in\ Year * 6} = \frac{1{,}157.6\ MG}{2129\ Days} = 0.54 \text{ Million } Gallons/Day$$

$$Base\ Sewerage = \frac{Total\ Flow\ During\ July - Sept.}{Days\ in\ July - Sept.\ \ * 6} = \frac{170.5\ MG}{553\ Days} = 0.31 \text{ Million } Gal/day$$

$$ADWF = \frac{Total\ Flow\ During\ Dry\ Period}{Days\ in\ Dry\ Period * 6} = \frac{382.7\ MG}{1102\ Days} = 0.35 \text{ Million } Gal/Day$$

$$AWWF = \frac{Total\ Flow\ During\ Wet\ Period}{Days\ in\ Wet\ Period * 6} = \frac{744.89\ MG}{1027\ Days} = 0.73 \text{ Million } Gal/Day$$

4.1.3 Dry Weather Flow

As indicated in the referenced DEQ guidelines, the ten-year Maximum Monthly Average Dry-Weather Flow ($MMDWF_{10}$) would be the monthly average flow in the rainiest summer month of high groundwater. West of the Oregon Cascades, the $MMDWF_{10}$ almost invariably occurs in May. The 10-Year MMDWF represents the anticipated monthly flow corresponding to the monthly rainfall accumulation during May with a 10% probability of occurrence in any given year.

Precipitation probabilities for various locations in Oregon are included in the report entitled "Climatography of the United States No. 20, Monthly Station Climate Summaries, 1971 – 2000" as published by the National Climatic Data Center. The closest probabilistic data sets are for the Fern Ridge Dam and have been used for this analysis.

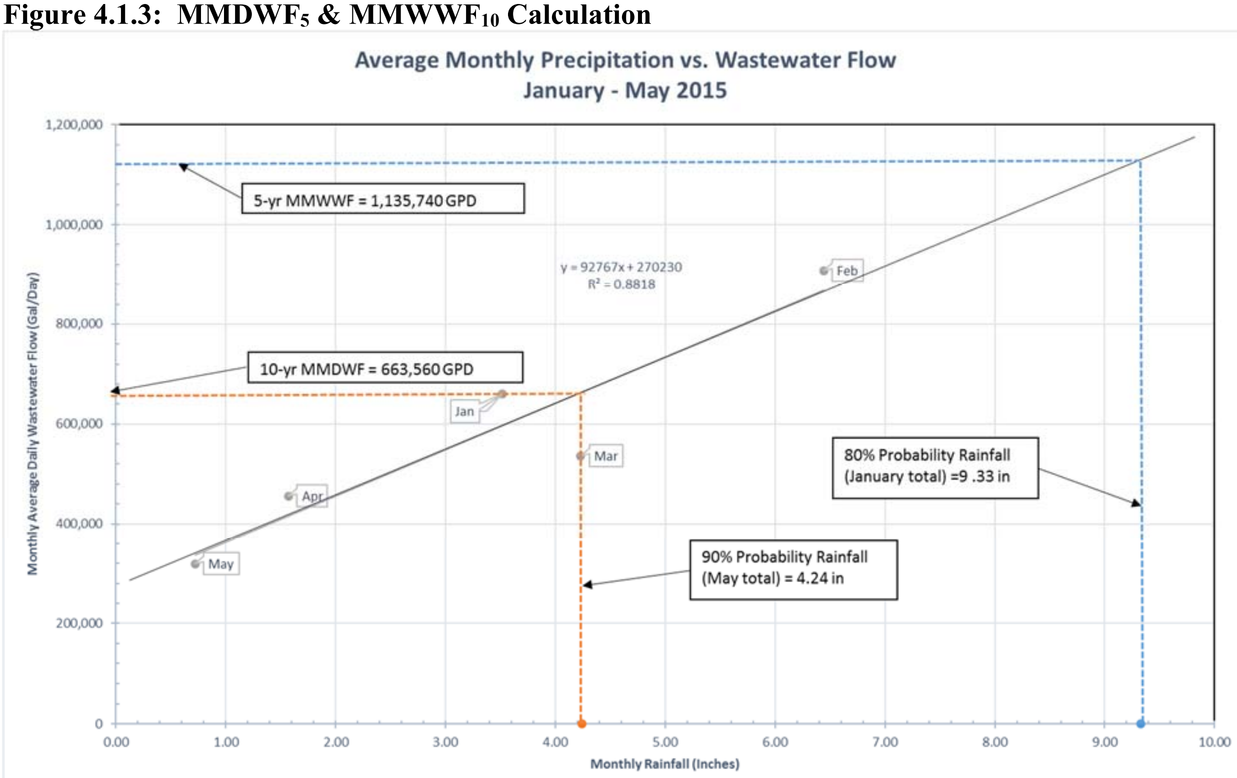
The graph in Figure 4.1.3 is based on five data points representing the average daily wastewater flows versus average monthly rainfall totals shown in Table 4.1.3 below. The points generate a trend line which can be used to predict average wastewater flows from a given monthly rainfall total. The 10-year MMDWF is the flow corresponding to the 10% probability precipitation ([1]0.9 (May)) of 4.24 inches for the month of May, as determined by the above referenced climatography report. As shown in Figure 4.1.3, the corresponding $MMDWF_{10}$ is 663,560 gallons per day.

Table 4.1.3: Average Rainfall and Wastewater Flows, 2010-2015

Precipitation and Rainfall Averages		
Month	Monthly Rainfall (in/month)	Monthly Avg. Day Flow (gpd)
Jan	3.52	660,323
Feb	6.44	908,143
Mar	4.23	536,258
Apr	1.57	455,867
May	0.72	319,355
[1]0.8 (Jan)	9.33	
[1]0.9 (May)	4.24	

*Data from *Climatology of the United States No. 20, 1971-2000*, for Fern Ridge Dam, OR., published by the National climate Data Center

Figure 4.1.3: MMDWF$_5$ & MMWWF$_{10}$ Calculation



4.1.4 Wet Weather Flow

Like many communities in western Oregon, the City of Veneta struggles with high volume wastewater flows caused by inflow and infiltration into the sanitary sewer system during the wet season. The flow analysis presented in the following section is based on the *Oregon DEQ Guidelines for Making Wet-Weather and Peak Flow Projections for Sewage Treatment in Western Oregon* (first published in 1996). These guidelines describe a detailed method for estimating wet-weather flow and peak flows in wastewater collection systems. This method is used to develop the minimum estimate for current flows from which to project future flows.

The referenced DEQ design guidelines indicate that high groundwater, west of the Cascades, is usually not attained until January, and heavy storms generally do not begin to cause a reliable or consistent infiltration response until January. Therefore, the MMWWF is expected to occur in January. The five-year January ([1]0.8 (Jan)) accumulation of 9.33 inches is indicated in the climatography report based on rainfall probability data for Fern Ridge Dam. When plotted with actual recorded events, the current five-year MMWWF is calculated to be 1,135,744 gallons per day, as shown in Figure 4.1.3 above.

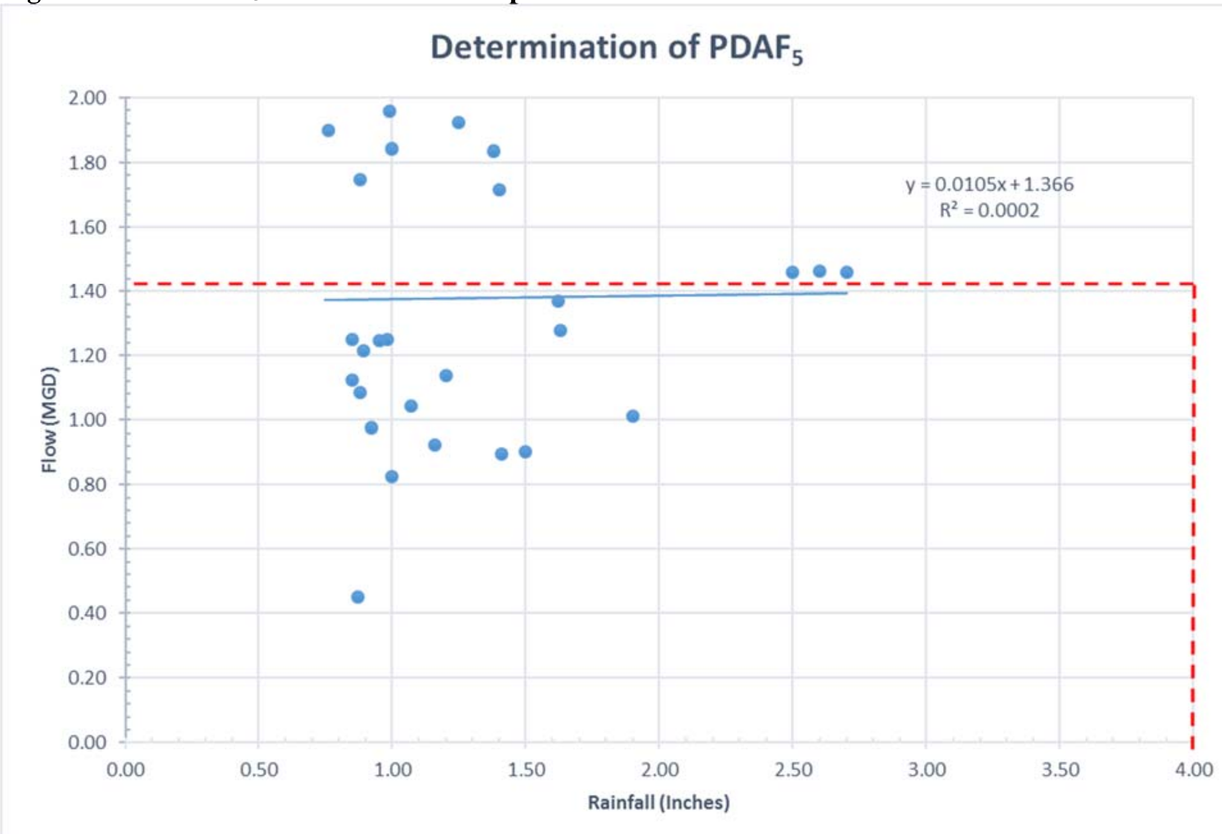
The Peak Day Average Flow ($PDAF_5$) corresponds to the five-year 24-hour storm event as defined by the NOAA isopluvial maps. Based on the NOAA maps, the five-year 24-hour event for the Veneta area is 4.0 inches of rain.

To determine the $PDAF_5$ using the DEQ methodology, actual events are plotted and a best-fit trend line is used to approximate the character of the system under different rainfall events. Rainfall data from the years 2010 through 2015 is used in the $PDAF_5$ calculation. Data points were selected based on the criteria that the daily rainfall was in excess of 3/4 inches and the 3-day cumulative rainfall prior to the event was in excess of 1.0 inches. A summary of the data points used are included in Table 4.1.4. Results are graphed in Figure 4.1.4.

Table 4.1.4: Significant Rainfall Data for the City of Veneta, 2010-2015

Date	Rainfall(in)	WW Flow (MGD)	Date	Rainfall(in)	WW Flow (MGD)
1/16/2010	0.88	1.084	1/11/2014	0.87	0.451
3/29/2010	1.41	0.894	1/12/2014	0.98	1.251
3/30/2010	1.5	0.902	2/12/2014	1.9	1.01
4/2/2010	0.76	1.898	2/14/2014	1.37	2.027
2/16/2011	0.85	1.249	2/15/2014	0.75	2.033
3/16/2011	1.2	1.136	2/16/2014	0.88	1.747
1/18/2012	2.6	1.462	2/19/2014	0.99	1.959
1/19/2012	2.7	1.461	3/6/2014	1.16	0.922
1/20/2012	2.5	1.461	3/9/2014	1.07	1.042
1/21/2012	1.4	1.717	3/29/2014	0.95	1.245
1/25/2012	1	1.844	4/27/2014	0.92	0.975
3/1/2012	1.38	1.834	1/18/2015	1	0.827
3/15/2012	0.89	1.214	2/7/2015	1.62	1.369
3/16/2012	1.63	1.278	2/9/2015	0.85	1.125
3/31/2012	1.25	1.923	2/10/2015	1.09	2.043

Figure 4.1.4: $PDAF_5$ Determination Graph



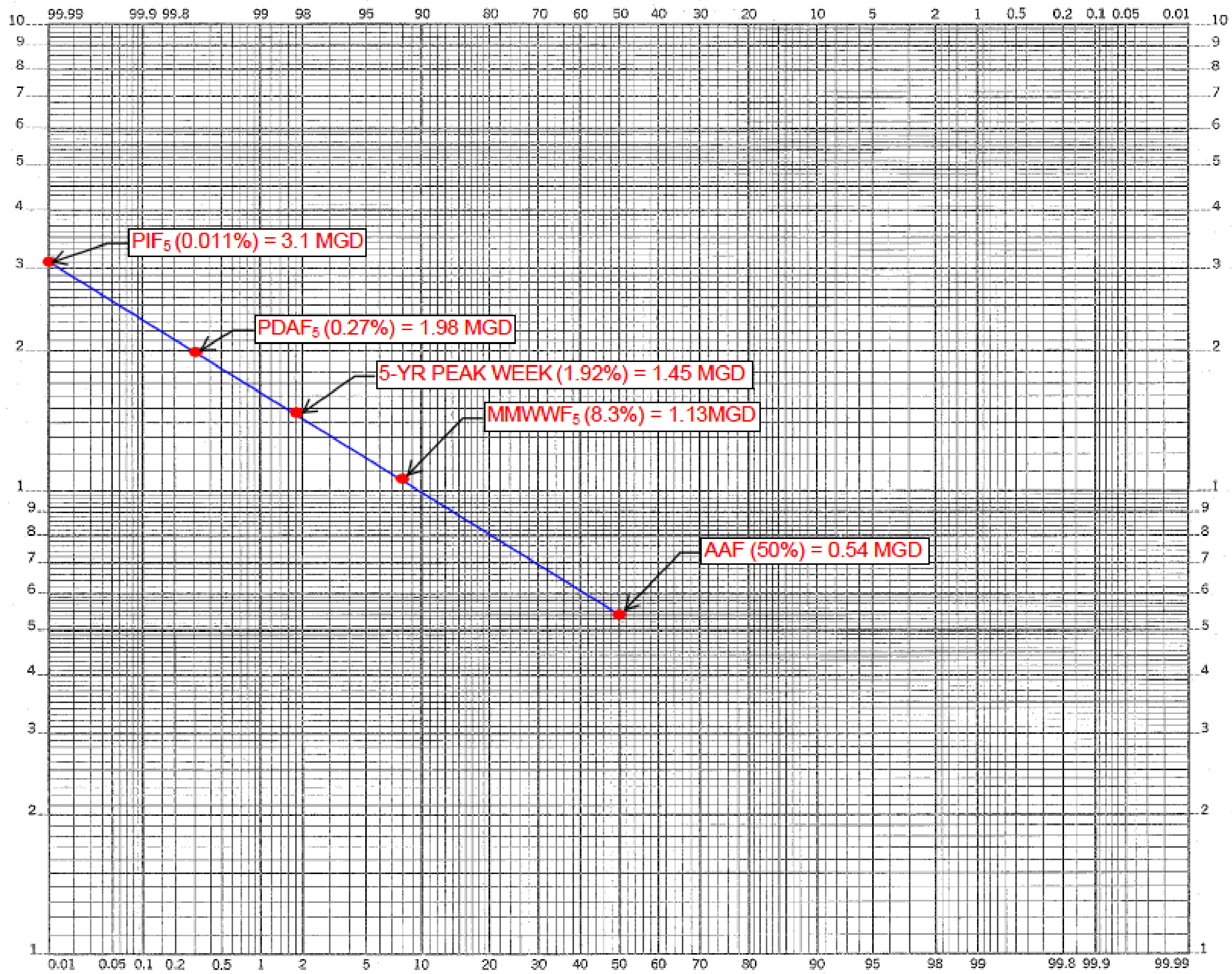
Based on Figure 4.1.4 above, the current $PDAF_5$ is approximately 1.408 MGD. Unfortunately, the R^2 factor for this graph is too low for the information to be deemed a reliable prediction of possible future flows. Based on plant discharge monitoring reports for the years 2010-2015, the largest four flows in the past 5 years have been 2,339,000 gpd, 2,185,000 gpd, 2,139,000 gpd, and 2,118,000 gpd. Using these four data points, a conservative $PDAF_5$ value of 1,980,000 gpd has been chosen as the design value.

DEQ guidelines for wastewater facilities design require critical plant and lift station components to be sized for the projected peak instantaneous flow (PIF_5). The current PIF_5, $PDAF_5$ and 5-year peak week flow for the City of Veneta have been estimated using a probability graph on logarithmic probability paper based on the data summarized below:

- The average annual flow (AAF) rate is the mean of the summer (ADWF) and winter (AWWF) flow rates. The probability of exceeding the AAF is 6/12, or 50%. AAF = 0.54 MGD.
- The $MMWWF_5$, as determined in Figure 2.5.2.1, has a probability of exceedance of 1/12, or 8.33%. $MMWWF_5$ = 1.13 MGD.
- The peak week flow occurs one week out of the year, for a probability of exceedance of 1/52, or 1.92%.
- The $PDAF_5$ is the daily flow associated with the 5-year storm. The probability of exceeding the PDAF is 1/365, or 0.27%. As determined above, the $PDAF_5$ from the calculation is unreliable so the trend line generated on the probability graph will be used to interpolate the value.
- The PIF, or "peak hourly flow" occurs once per year for a probability of exceedance of: $\frac{1\ hour}{year} * \frac{1\ year}{365\ days} * \frac{1\ day}{24\ hours} = \frac{1}{8760} = .011\%$.

- Assuming, as allowed by the DEQ guidelines, that the maximum PIF occurs during the peak day, peak week and peak month, we can create the graph shown in Figure 4.1.4A

Figure 4.1.4A: PIF Calculation Log-Log Graph



4.1.5 Infiltration and Inflow

Nearly all communities in Oregon struggle with the issue of inflow and infiltration (I/I) within their wastewater collection systems. Inflow and infiltration are defined as follows:

<u>Infiltration</u>: Flows that enter the collection system through underground paths. Infiltration can be caused by high groundwater levels, rain-induced groundwater, leaky water and storm drain systems, and other sources. Infiltration flows make their way into the collection system through cracks in pipe, open or offset pipe joints, broken piping sections, leaks in manholes, and other below-grade openings in the collection system.

<u>Inflow</u>: Flows that enter the collection system through above ground paths. Inflow is often related to building downspouts being connected to sanitary sewer service laterals, interconnections with storm drain systems that have not been separated, water flowing over manholes and entering in through the openings

in the lids, catch basins, or area drains being connected to the sewer system, and other surface water sources.

When combined, Infiltration and Inflow (I/I) can result in a tremendous increase in flows during the winter, particularly during prolonged storm events. Comparison of the records of daily rainfall and the WWTP flows shows a marked increase in wastewater flows during heavy rain events. The following table summarizes current I/I levels based on the flow calculations shown above.

Table 4.1.5: Inflow and Infiltration Summary

Current Inflow and Infiltration											
Item				**MGD**				**I/I FLOW**		**Per Capita**	
AWW I/I	= AWWF	-	Base Sewerage →	0.54	-	0.31	=	0.23	MGD →	48.7	gpcd
MMWW I/I	= $MMWWF_5$	-	Base Sewerage →	1.13	-	0.31	=	0.82	MGD →	173.7	gpcd
Peak Day I/I	= $PDAF_5$	-	Base Sewerage →	1.98	-	0.31	=	1.67	MGD →	353.7	gpcd
PI I/I	= PIF_5	-	Base Sewerage →	3.1	-	0.31	=	2.79	MGD →	591.0	gpcd

Based on the EPA I/I Analysis and Project Certification publication (#97-03) (EPA, 1985), the determination of "excessive" or "non-excessive" infiltration is based on an average flow rate during a period of seasonal high groundwater. For the purposes of this analysis, the average flow for the month of May (319,355 gpd) as shown in Table 4.1.3 was used as a characteristic flow meeting the definition above. Per the EPA publication, any flow greater than 120 gpcd indicates the infiltration may be "excessive". Converting 319,355 gpd to a per capita flow rate is done by dividing by the population served (4,721 persons). Performing this calculation leads to a daily per capita flow rate of 67 gpcd. This is well below the EPA maximum rate. Therefore, per the EPA publication, the City of Veneta does not have excessive infiltration.

Per the same EPA publication, excessive inflow is determined by the "highest daily flow recorded during a storm event." By this definition, the comparison should be made to the peak day average flow (PDAF). If the wet weather flow is below 275 gpcd, the inflow is considered non-excessive. I/I for a peak day average flow for Veneta, as determined above, is 1.67 MGD. Dividing by the estimated current population (4721 persons), a flow rate of 354 gpcd is obtained. This is in excess of the limit (275 gpcd) presented by the EPA. Therefore, per the EPA publication, the City of Veneta may have excessive inflow.

The final determination as to whether I/I flows are actually excessive depends on the cost effectiveness of needed repairs.

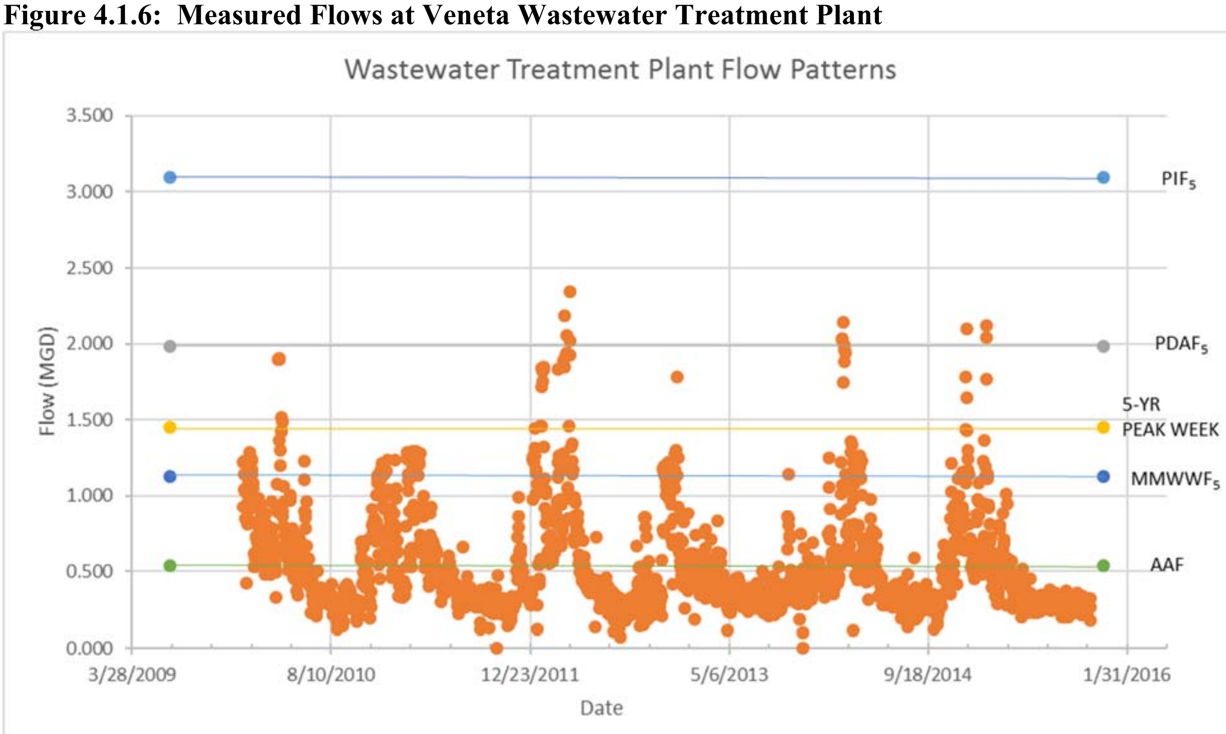
4.1.6 Summary of Existing Flows

Table 4.1.6 below, summarizes the current dry and wet weather flows for the City of Veneta. Definitions for the different flow criteria are provided in Section 4.1.1. Figure 4.1.6 shows the historical daily flows at the plant and how they relate to the identified flow parameters.

Table 4.1.6: Summary of Existing Wastewater Flows, Based on 2010-2015 Data

Summary of Current Wastewater Flows			
Parameter	**2010-2015 Flow (GPD)**	**Basis**	**Per Capita Flow[1] (GPD)**
Dry Weather Flows			
ADWF	347,892	Analysis of 2010-2015 DMRs (May - Oct)	74
Base Sewerage	303,361	Assume no I/I (July - Sept)	64
Base Infiltration	44,531	ADWF - Base Sewerage	9
$MMDWF_{10}$	663,561	Figure 4.1.3 (DEQ Graph No. 1)	141
Annual Flows			
AAF	535,032	Analysis of 2010-2015 DMRs (May - Oct)	113
Wet Weather Flows			
AWWF	725,305	Analysis of 2010-2015 DMRs (Nov - Apr)	154
$MMWWF_5$	1,135,744	Figure 4.1.3 (DEQ Graph No. 1)	241
Peak Week	1,450,000	Figure 4.1.4 (DEQ Graph No. 3)	307
Peak Day (PDAF)	1,980,000	Figure 4.1.4 (DEQ Graph No. 3)	419
Peak Hourly (PIF)	3,100,000	Figure 4.1.4 (DEQ Graph No. 3)	657
Inflow and Infiltration			
AWW I/I	421,944	AWWF - Base Sewerage	89
MMWW I/I	832,382	MMWWF - Base Sewerage	176
Peak Day I/I	1,676,639	PDAF - Base Sewerage	355
Peak Hourly I/I	2,796,639	PIF - Base Sewerage	592

Figure 4.1.6: Measured Flows at Veneta Wastewater Treatment Plant



4.1.7 Projected Municipal Wastewater Flows

Projected wastewater flows are developed based on the assumption that base sewerage flow per capita would hold constant. This results in the increase in projected flows being proportional to the population growth. Per Section 2.3, the population may increase by over 16% from 2015 data to the end of the 20-year planning cycle.

Projected peak flows are calculated assuming current I/I flows remaining constant and projected base sewerage increases with population. The City has plans to address I/I issues and to continue monitoring and repairing the worst I/I areas, which would lead to less I/I. However, assuming a no decrease to current I/I flows would lead to conservative design flows and is therefore the approach taken to flow projections.

The tables below summarize the projected growth of Veneta for the next 20 years and the associated flow (Table 4.1.7) increases that would be assumed to occur with the growth. All methods and calculations used to determine current and projected flows are found in section 4.1.7

Table 4.1.7: Summary of Current and Projected Wastewater Flows

Summary of Current & Projected Wastewater Flows								
Parameter	**Base Sewerage Peaking Factors***	**I/I (Gal/Day)***	**2015 Population**	**2015 Base Sewerage (Gal/Day)**	**2015 Flow (Gal/Day)**	**2035 Population**	**2035 Base Sewerage (Gal/Day)**	**2035 Flow (Gal/Day)**
Dry Weather Flows								
Base Sewerage	1.00	0		303,361	303,361		493,950	493,950
ADWF	1.17	-6,535	4,721	354,428	347,892	7,687	577,100	570,564
$MMDWF_{10}$	1.29	273,728		389,833	663,561		634,749	908,476
Wet Weather Flows								
AWWF	1.28	335,709		389,596	725,305		634,362	970,071
$MMWWF_5$	1.45	697,263		438,481	1,135,744		713,960	1,411,223
Peak Week	1.49	996,997	4,721	453,003	1,450,000	7,687	737,605	1,734,602
Peak Day (PDAF)	1.64	1,481,576		498,424	1,980,000		811,562	2,293,138
Peak Hourly (PIF)	2.50	2,341,596		758,404	3,100,000		1,234,876	3,576,472
* Base Sewerage peaking factors and I/I is assumed to remain constant during the planning period.								
Base Sewerage based on average daily flow of 64 gallons per capita per day, based on the 2010-2015 avg per capita base flow								

4.2 Wastewater Composition

4.2.1 Introduction

Wastewater composition refers to the solids, chemicals, organics, and other materials that make up municipal wastewater. Because wastewater is generated by residential, commercial and industrial sources, the constituents within the wastewater can vary greatly. However, the wastewater treatment requirements and treated water quality requirements remains consistent, based upon NPDES Permit requirements.

4.2.2 Analysis of Plant Records

Analysis of the last six years of Discharge Monitoring Reports (DMRs) from the Wastewater Treatment Plant has identified a number of parameters that characterize the City's wastewater. Plant records include influent measurement of BOD and TSS a minimum of once per week. Figure 4.2.2A, Figure 4.2.2B, Figure 4.2.2C, and Figure 4.2.2D below summarize the composition and loading of these primary constituents.

Figure 4.2.2A: Wastewater Treatment Plant Influent BOD Composition

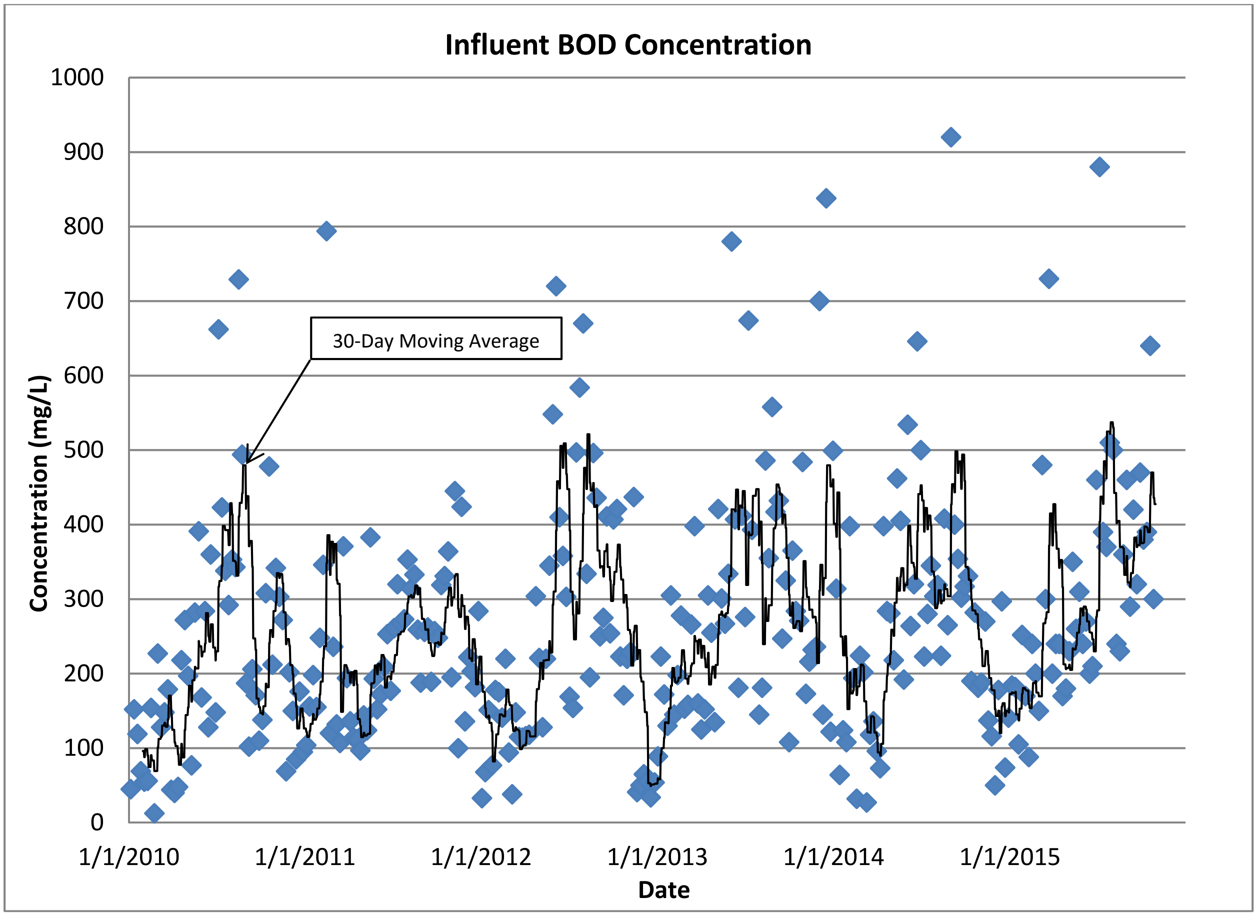


Figure 4.2.2B: Wastewater Treatment Plant Influent BOD Influent Loading

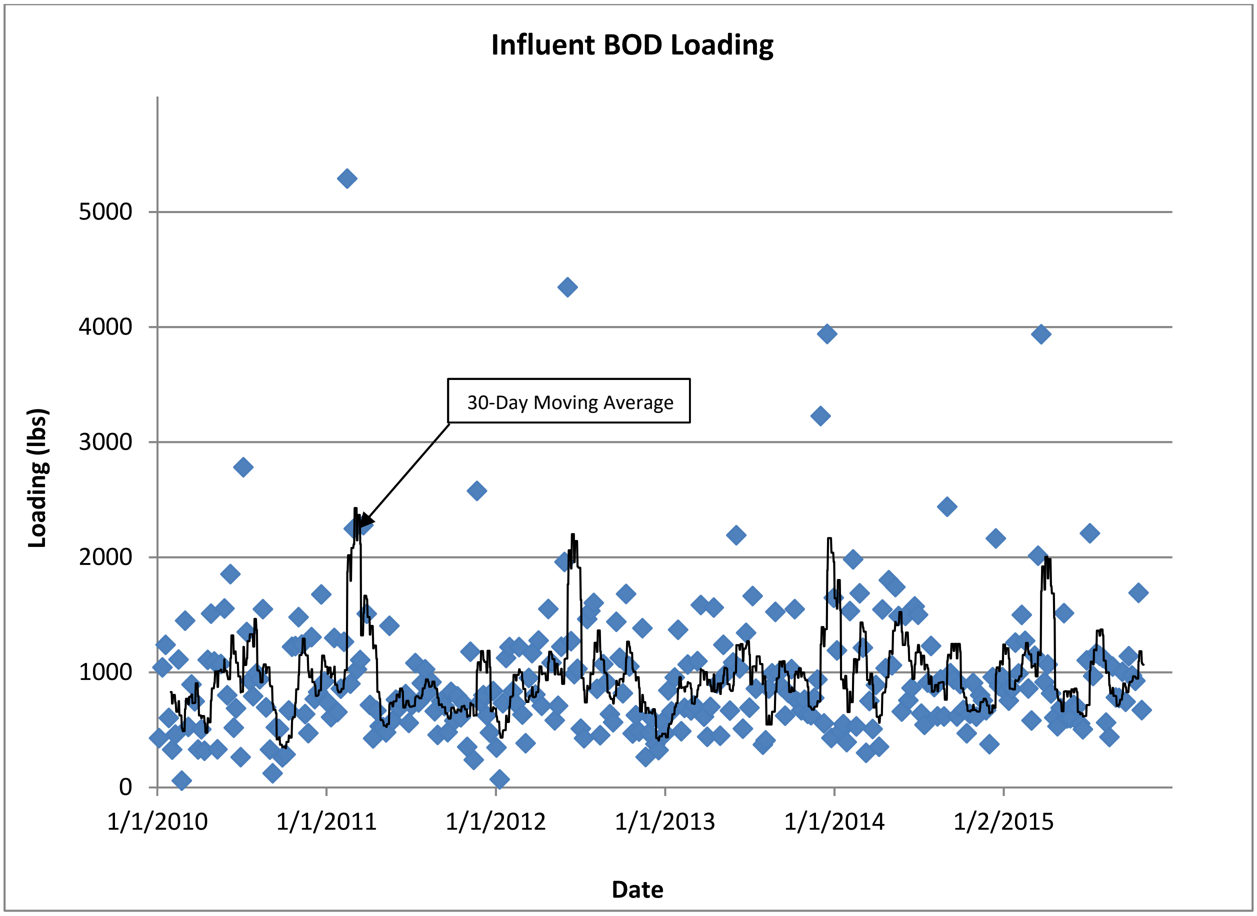


Figure 4.2.2C: Wastewater Treatment Plant Influent TSS Composition

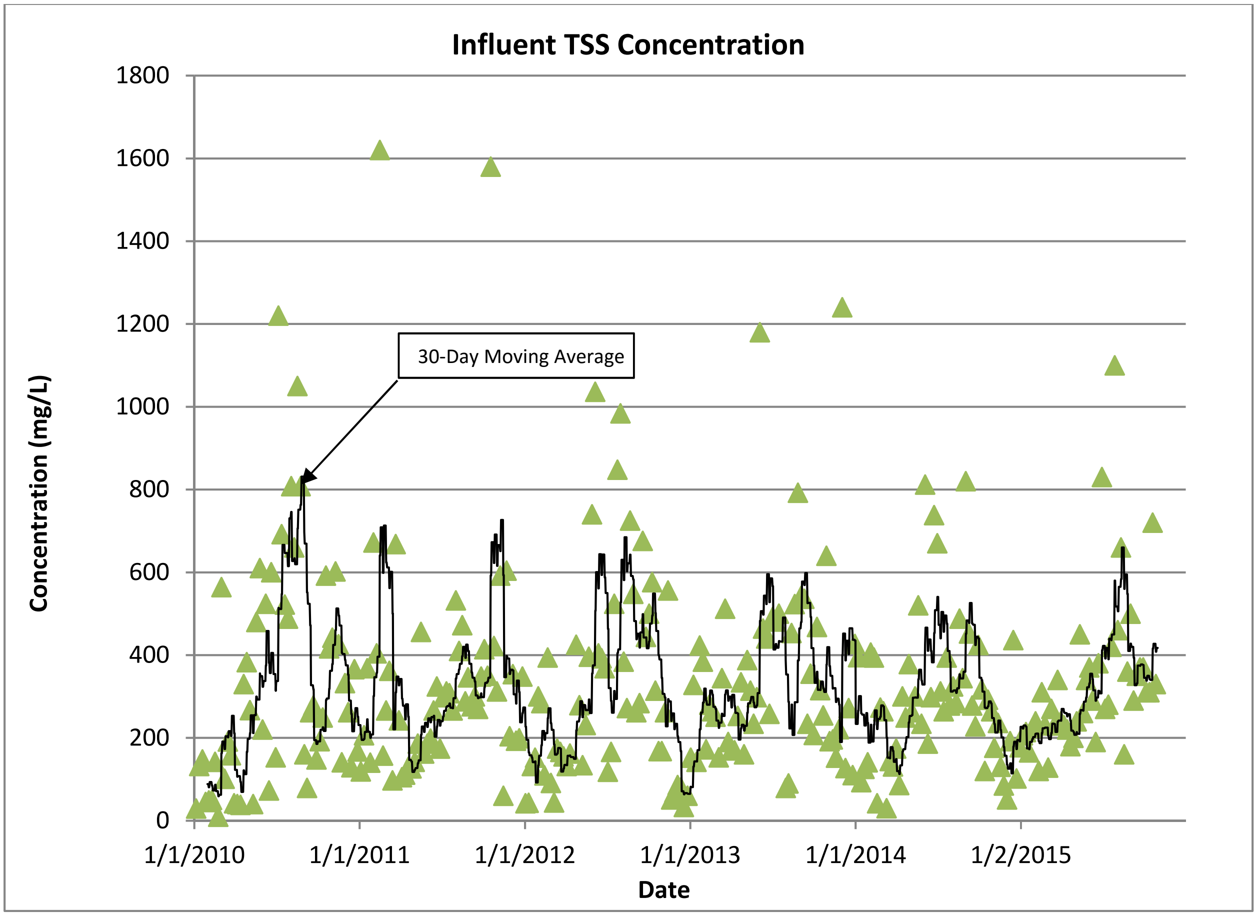
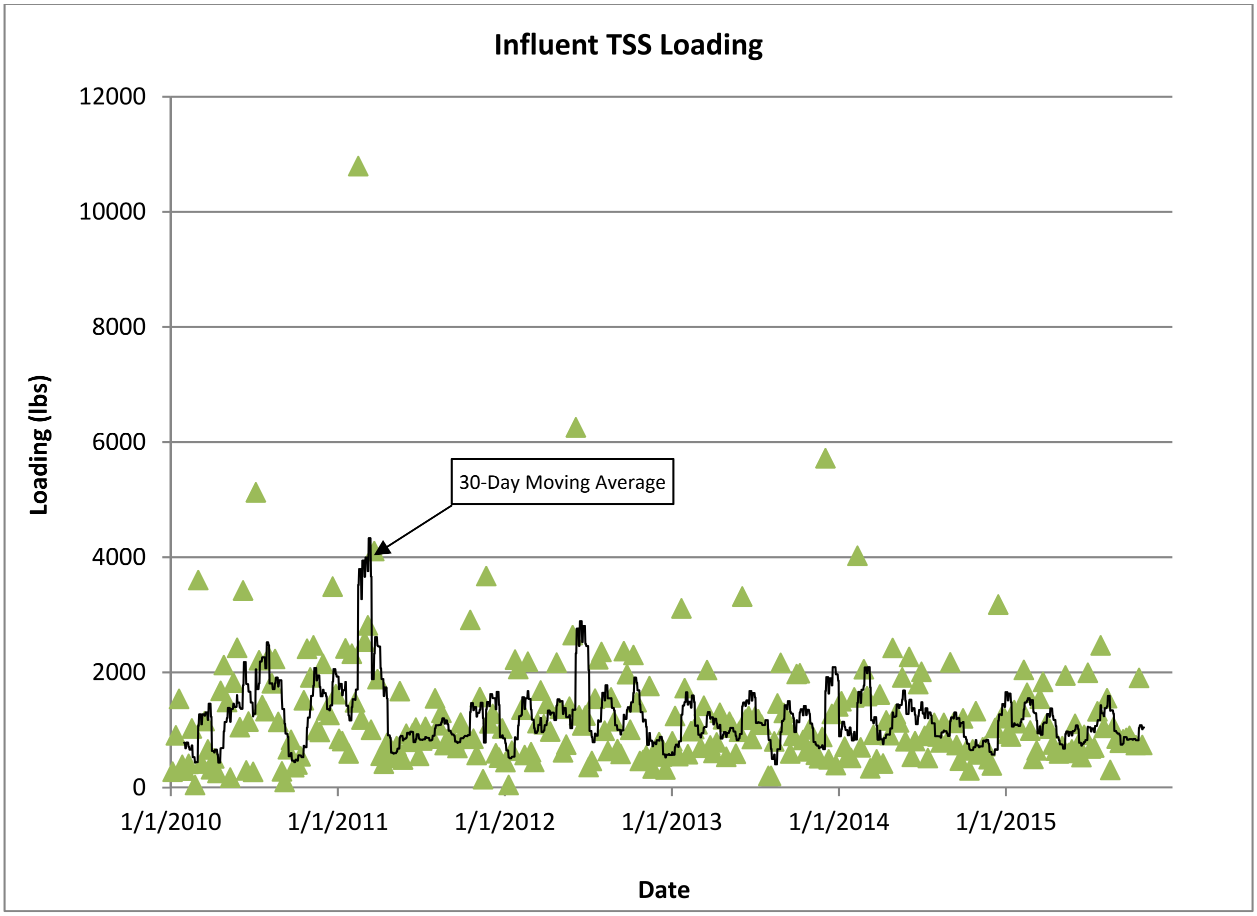


Figure 4.2.2D: TSS Influent Loading



4.2.3 Municipal Wastewater Composition Summary

Table 4.2.3A below, summarizes the municipal wastewater composition and loading of the influent in terms of BOD, TSS and pH.

Table 4.2.3A: Existing Municipal Wastewater Composition

Current Wastewater Composition Summary						
	BOD		TSS			
Flow Parameter	Concentration (mg/L)	Loading (lbs.)	Concentration (mg/L)	Loading (lbs.)	**pH**	
Annual Average	263	965	326	1226	6.96	
	Average		Average		Minimum	Maximum
Winter (Nov-Apr)	192	981	237	1264	5.16	8.11
Summer (May-Oct)	331	950	409	1191	5.85	8.01
Maximum Month	415	2080	832	3945	7.78	
Maximum Day	920	5291	1620	10795	8.11	
				Minimum Month	6.26	
				Minimum Day	5.16	

As seen above, the summer and winter flows in recent years have had significantly different concentrations of BOD and TSS, while the loading of these constituents was relatively independent of the seasonal flow fluctuation as would be expected due to the influx of I/I.

Typical concentrations of contaminants within untreated domestic wastewater are identified in the text *Wastewater Engineering, Treatment and Reuse*, Metcalf & Eddy, 5th Edition, 2014. Data given in the referenced text is summarized in Table 4.2.3B below for comparison to the average load concentration shown in the table above, as measured at the Veneta WWTP.

Table 4.2.3B: Typical Composition of Untreated Domestic Wastewater

Typical Wastewater Composition				
		Concentration		
Contaminant	Unit	Low Strength	Medium Strength	High Strength
Biochemical Oxygen Demand, 5-d, 20° C (BOD)	mg/L	133	200	400
Total Suspended Solids (TSS)	mg/L	130	195	389
Fecal Coliform	No./100mL	10^3 - 10^5	10^4 - 10^6	10^5 - 10^8
Free Ammonia Nitrogen (NH_3-N)	mg/L	12	20	41

Source: Table 3-18**,** *Wastewater Engineering, Treatment and Reuse*, Metcalf & Eddy, 5th Edition, 2014.

By comparing the typical values in the above table to the overall average constituent concentrations presented in Table 4.2.3A, average influent BOD and TSS values for Veneta are considered medium to high strength.

4.2.4 Projected Municipal Wastewater Characteristics

The current population served by the City of Veneta, is 4839 persons. Based on growth projection data discussed in section 2.3, the population served at the end of the design period in 2036, is anticipated to be approximately 7795 persons.

At this time, no significant change to the current ratio of residential to commercial to industrial sources is expected within the collection system. Therefore, for the purposes of projecting municipal wastewater characteristics, it is assumed that flows and loading would increase over time based on the increase in population and that the composition, per unit volume, of the municipal wastewater would remain the same.

Projected BOD and TSS loadings for Veneta in the year 2036 are summarized in Table 4.2.4 below, including the unit loading presented in units of pounds per person per day. The values presented for BOD and TSS have been determined by dividing the average and peak loads determined from the DMRs by the existing population to obtain unit loads (design factors) in terms of pounds per capita day. The unit design factors were then multiplied by the projected population to determine projected loading. For ammonia, textbook values for average per capita loadings were used for average conditions; maximum month and maximum day loadings were estimated using conservative multipliers keeping with the trend seen for other parameters.

Table 4.2.4: Summary of Current and Projected Wastewater Influent Loads

Current and Projected Wastewater Influent Loads								
Parameter	2014 Loading (lbs./day)		2014 Population	Unit Loading (lbs./capita-day)		2036 Population	2036 Loading (lbs./capita-day)	
	BOD	TSS		BOD	TSS		BOD	TSS
Annual Average	982	1141	4689	0.20943	0.24334	7,795	1632	1897
Winter Average	960	1192		0.20473	0.25421		1596	1982
Summer Average	1004	1090		0.21412	0.23246		1669	1812
Maximum Month	1238	2086		0.26402	0.44487		2058	3468
Maximum Day	2440	4025		0.52037	0.85839		4056	6691

Based on the current treatment system, projected 2036 effluent loading values for BOD/TSS are likely to exceed current permit values. See Table 4.2.4a below.

Table 4.2.4a: Summary of Current and Projected Wastewater Effluent Loads

Current and Projected Wastewater Effluent Loads								
Parameter	2014 Loading (lbs./day)		2014 Population	Unit Loading (lbs./capita-day)		2036 Population	2036 Loading (lbs./capita-day)	
	BOD	TSS		BOD	TSS		BOD	TSS
Annual Average	16	29	4689	0.00341	0.00616	7,795	27	48
Winter Average	21	42		0.00448	0.00904		35	70
Summer Average	10	13		0.00213	0.00275		17	21
Maximum Month	63	100		0.01344	0.02139		105	167
Maximum Day	122	199		0.02602	0.04244		203	331

5 Basis for Planning

5.1 Regulatory Requirements

Many federal and state regulations are put in place to ensure health, sanitation, and security of the public. This section will report on relevant regulations governing the City's wastewater treatment facilities

The Clean Water Act (CWA) as delegated by the US-EPA to the State of Oregon and enforced through Oregon Revised Statues (ORS 468B.050), requires permits for all discharges of wastewater to waters of the state. The City of Veneta operates its wastewater system under the jurisdiction of the Oregon Department of Environmental Quality (DEQ), with a National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit (Permit No. 102480) which was issued on December 13, 2013 (See Appendix A). This NPDES permit is in effect until June 30, 2017. Permits are issued for periods of 5-years. If the permittee applies for permit renewal in a timely manner (180 days prior to expiration) the permit would remain active until such time as the DEQ takes action on the permit renewal application.

The 2013 NPDES permit allows the City to discharge treated wastewater to the Long Tom River at river mile 33 from November 1 to April 30 under the prescribed effluent limitations and other requirements. These effluent limits are developed to protect the beneficial uses for the Willamette Basin (Oregon Administrative Rules 340-45-0080).

Oregon Administrative Rules (OAR) also contain both statewide and basin specific minimum design criteria and rules regarding sanitary sewage overflows. These rules are discussed below:

5.1.1 Minimum Design Criteria for Wastewater Treatment and Control of Wastes

OAR 340-041-0007 (Statewide Narrative Criteria) includes minimum design criteria for wastewater treatment and control of wastes. Generally, wastewater from a municipal wastewater treatment system must be treated and controlled in facilities designed in accordance with the following minimum criteria:

- In designing wastewater treatment facilities, average conditions and a normal range of variability are generally used in establishing design criteria. A facility once completed and placed in operation should operate at or near the design limit most of the time but may operate below the design criteria limit at times due to variables which are unpredictable or uncontrollable. This is particularly true for biological wastewater treatment facilities. The actual operating limits are intended to be established by permit pursuant to ORS 468B.050 and recognize that the actual performance level may at times be less than the design criteria.
- Effluent BOD concentrations in mg/l, divided by the dilution factor (ratio of receiving stream flow to effluent flow) may not exceed one unless otherwise approved by the Environmental Quality Commission;
- Sewage wastes must be disinfected, after wastewater treatment, equivalent to thorough mixing with sufficient chlorine to provide a residual of at least 1 part per million after 60 minutes of contact time unless otherwise specifically authorized by permit;
- Positive protection must be provided to prevent bypassing raw or inadequately treated sewage to public waters unless otherwise approved by the Department where elimination of inflow and infiltration would be necessary but not presently practicable; and

- More stringent waste treatment and control requirements may be imposed where special conditions make such action appropriate.

OAR 340-041-0345 (Water Quality Standards and Policies for the Willamette Basin) includes minimum design criteria for treatment and control of wastes. These are as follows:

- pH values may not fall outside the range of 6.5 to 8.5.
- During periods of low stream flows (approximately May 1 to October 31): Treatment resulting in monthly average effluent concentrations not to exceed 10 mg/l of BOD and 10 mg/l of SS or equivalent control;
- During the period of high stream flows (approximately November 1 to April 30): A minimum of secondary treatment or equivalent control and unless otherwise specifically authorized by the Department, operation of all waste treatment and control facilities at maximum practical efficiency and effectiveness so as to minimize waste discharges to public waters.

New or expanded wastewater treatment systems must meet the requirements described above.

5.1.2 Sanitary Sewage Overflows (SSOs)

OAR 340-041-0009 (6) and (7) prohibit discharging of raw sewage to waters of the state in the winter and summer, respectively. During the winter (November 1 through May 21), raw sewage discharges are prohibited, except during a storm event greater than the one-in-five year 24-hour duration storm. During the summer (June 1 through October 31), raw sewage discharges are prohibited, except during a storm event greater than the one-in-ten year 24-hour duration storm. Exceptions apply however for both summer and winter raw sewage discharges which are described in OAR 340-041-0009.

Currently however, all DEQ water quality permits prohibit **all** SSOs to surface water.

5.1.2 Water Quality Status of Receiving Waterbody

Per OAR 340-041-0004, the Antidegradation Policy guides decisions that affect water quality such that unnecessary further degradation from new or increased point and nonpoint sources of pollution is prevented, and enhances existing surface water quality to ensure the full protection of all existing beneficial uses.

5.1.2.1 Clean Water Act, Section 303(d)

Section 305(b) of the Clean Water Act (CWA) requires DEQ to assess water quality in Oregon and report on the overall condition of waters. DEQ assigns an assessment status category to each water body where data are available to evaluate. Water bodies that do not meet water quality standards are Water Quality Limited and are assigned Category 4 or Category 5. Water bodies in Category 5 need pollutant Total Maximum Daily Loads (TMDLs) developed. The Category 5 water bodies comprise the Section 303(d) list.

During the winter discharge period of November 1- April 30, outfall 001, the Long Tom River receiving water body is water quality limited for dissolved oxygen, iron, manganese and pH. Table 5.1.2.1 summarizes the water quality status of the Long Tom River near the City of Veneta.

Table 5.1.2.1: Willamette Basin Water Quality Status

Parameter	Season	Status	Assessment Year	Assessment Action
Dissolved Oxygen	Jan 1 – Mar 15	Cat 5: Water quality limited, 303(d) list, TMDL needed	2012	Segment Modification
E. Coli	Fall/Winter/Spring	Cat 4A: Water quality limited, TMDL approved	2012	New Cat 4A: Water quality limited, TMDL approved
E. Coli	Summer	Cat 4A: Water quality limited, TMDL approved	2012	New Cat 4A: Water quality limited, TMDL approved
Iron	All Year	Cat 5: Water quality limited, 303(d) list, TMDL needed	2012	No Status Change
pH	Fall/Winter/Spring	Cat 5: Water quality limited, 303(d) list, TMDL needed	2012	No Action

5.1.2.2 Temperature

Water temperatures affect the biological cycles of aquatic species and are a critical factor in maintaining and restoring healthy salmonid populations throughout the state. It is the policy of the Environmental Quality Commission (EQC) to protect aquatic ecosystems from adverse warming caused by anthropogenic activities. The purpose of the temperature criteria listed in OAR 340-041-0028 is to protect designated temperature sensitive beneficial uses, including salmonid life cycle stages in waters of the State.

The DEQ list of Water Quality Limited Water Bodies for 2012 indicates that River Mile 33 of the Long Tom River is not water quality limited for temperature.

5.2 Aging Infrastructure

5.2.1 Wastewater System Deficiencies

Much of the older portions of the wastewater collection system in Veneta are constructed from aged concrete sewer pipe. After time, these pipe sections are known for having leaky joints due to the degradation of grout or gasket material in the joint. If groundwater levels rise above the level of the sewer mains, due to prolonged rainfall, each joint may begin to leak a small amount. When combined, all of the small leaks can form a significant amount of infiltration flows. The City has made a continued effort to replace older sections of pipe in an effort to reduce I/I, it is recommended that the City continues to be proactive in replacing the older sections of pipe.

Deficiencies in the collection system are many of the same deficiencies that existed when the 2009 City of Veneta Wastewater Master Plan was written. Flow mapping and smoke testing may be beneficial in isolating current I/I sources. As such, we recommend that the City authorize a new flow mapping/smoke test study to identify current I/I sources.

Wastewater Treatment Plant

The current Wastewater Treatment Plant has a Class 1 rated design capacity of 1.25 MGD. Over the 5-year study period the 1.25 MGD capacity has been exceeded 72 times, many of the flows were close to double the 1.25 MGD capacity. Projected peak hourly flows for the year 2036 will exceed 3.5 MGD.

The wastewater treatment plant has been able to operate within allotted permit levels by the use of a 4-million-gallon surge pond connected to the influent lift station. When flows exceed the 1.25 MGD capacity of the influent lift station, the influent level in the wetwell rises and flow is diverted to the surge pond. After the flow has diminished, the surge pond effluent valve can be opened to allow untreated sewage from the surge pond to flow into the influent lift station to be pumped to the plant for treatment.

Current calculated flows for worst case scenario when a peak day flow occurs at the end of a peak week flow occurring at the end of a maximum month have shown that the above surge pond bypass method would work without overflowing the surge pond or exceeding DEQ permit limits. This method for handling higher flows into the wastewater treatment plant will not be viable long term. Based on population growth projections, the surge pond would reach the 4-million-gallon capacity in 2026 at a population of 6200. This estimate is population driven and therefore upgrades may be required sooner or later than 2026 due to development or lack thereof.

Prior to the population increasing to 6200, it is recommended that both the influent pumping station and the Biolac basins be upgraded to handle the projected flows. The current double screw influent pump could still be employed if flows from newly developed areas are pumped straight to the headworks. The existing two Biolac aeration basins would need to be expanded to a four basin system. The headworks would also need to either be replaced or modified to handle the increased flows and in particular, the flow splitting to accommodate the new four basin Biolac.

Collection System

Current deficiencies in the collection system may still exist from those identified in the 2009 WWMP/CIP. Flow mapping and smoke testing may help to confirm the effectiveness of the recent repairs, and can also help to identify smaller sources of I/I that were masked during prior studies by larger I/I sources.

5.2.2 Violation History

The wastewater treatment plant submits monthly DMRs to document compliance with permit limits. The City received a single enforcement action in 2011 for *"failure to collect all required monitoring data and violating a technology-based effluent limit"*. The City was assessed a single civil penalty for both violations. The penalty has been paid and the City is considered to be in substantial compliance with the current permit.

5.2.3 Reasonable Growth

The planning period for this document is 20 years starting in 2016. The projected growth for the City of Veneta for the year 2036 is 7795, per the Lane County coordinated growth rate. This is an over 62% increase of the current population serviced by the current wastewater treatment facility.

5.3 Design Capacity of Conveyance System and Wastewater Treatment Plant

5.3.1 Conveyance System

It is a priority to ensure that the conveyance system is designed to convey the Peak Instantaneous Flow (PIF). Current and future flows were calculated based on the available information from DMR data from the wastewater treatment plant from January 2010 to October 2015, and Lane County Coordinated Population Forecast. Flows for individual basins were calculated as the ratio of connections in the basin divided by the total number of connections for the entire town multiplied by total flows measured at the wastewater treatment plant.

For future flows, it was assumed that future growth would occur equally throughout the City. This is not how growth would occur, but without any planning documents showing projected growth, it is the best available assumption. Based on city limits, topography and population density, the areas of the town most likely to see larger flow rates would be the area north of Highway 126, and the eastern end of town. Typically, when isolated development occurs, the entire sewer main connecting the proposed development would have to be analyzed to ensure it has sufficient capacity to carry the increased flows.

Conveyance capacity of the existing gravity collection system was calculated in the 2009 Wastewater Master Plan. Deficiencies were identified and included in the 2009 Capital Improvement Plan.

5.3.2 Lift Stations

Lift stations must have a firm capacity (capacity with largest pump out of service) to convey the Peak Instantaneous Flow (PIF). Based on limited data available, the PIF in previous studies was close to the current PIF.

The firm design capacity for the Jeans Road lift station is 130 gpm which is inadequate for the calculated PIF of 215 gpm for the service area. This lift station should either be upgraded to pump the calculated peak flow in the near future, or it should be rebuilt.

The Pine Street lift station has a firm design capacity of 350 gpm, which is inadequate for the calculated PIF of 795 gpm for the service area. This lift station should be upgraded.

5.3.3 Wastewater Treatment Plant Facilities

With the 2009 improvements, and surge pond method, the wastewater treatment plant appears to be adequate to treat current flows. Projected peak flows however, would take the surge pond, influent lift station, and the Biolac basins beyond their design capacities.

The surge pond is projected to exceed its 4-million-gallon capacity when the population reaches 6200, or by current projections, the year 2026. If the treatment plant is to continue to use this method for handling peak flows, it is recommended that the surge pond be increased in capacity, or the wastewater treatment plant itself be increased in capacity, or perhaps both the surge pond and the wastewater treatment plant should be increased in capacity.

The influent lift station has a firm design capacity of 1.25 MGD, this is far below current peak flows. The wastewater treatment plant has been able to operate with this smaller capacity by the use of the surge pond. However, when the surge pond is at capacity, flows greater than 1.25 MGD would have to flow through the wastewater treatment plant.

In the 2009 WWMP/CIP, the Biolac basins were considered to be running at 85% of the 1.25 MDG firm design capacity. Current loading is somewhat larger than the 2009 loading, putting the Biolac aeration basins close to design capacity. Increased development/flow would further compound the need to upgrade capacity of the Biolac system.

6 Development Options

6.1 2009 WWMP/CIP Summary

6.1.1 2009 Introduction Summary

In the years prior to the 2009 Wastewater Master Plan and Capital Improvement Plan, population data indicated that Veneta was in the midst of an unprecedented population growth spurt. In 2008, the United States experienced an economic crisis of magnitude not seen since the Great Depression. The extent and impact of this "Great Recession" could not have been forecasted when the 2009 WWMP/CIP was done. Consequently, in light of the actual population growth since 2009, the population projections and timelines used in the 2009 WWMP/CIP are substantially overstated. Much of the 2009 assessment and modeling of the wastewater system is valid regardless of population trends, and is useful information. Adjusting the 2009 CIP dates to match current population and development trends would give a more accurate projection for project planning.

The 2009 WWMP/CIP focused on four major tasks; System Information Review, Hydraulic Model Development, Systems Alternative Analysis, and the Final Report. The information review used data from City planners and the 1997 mapping and facility plan. Hydraulic modeling was done using a commercially available computer program, and actual flow testing in three of the sewer sheds to calibrate the hydraulic model. The Systems Alternative Analysis details possible upgrades to the collection system, plans for future collection systems, effluent reuse, and level IV treatment. The Final Report consists of both the WWFP and the CIP.

6.1.2 2009 Study Area Summary

The 2009 Study Area section focuses on the physical and socio-economic setting of the City. The 2009 study area is limited to the Urban Growth Boundary of the City of Veneta, this coincides with the City limits and has remained unchanged since the 2009 report. The 1997 WWMP also used the same study area.

The 1997 WWMP reviews at length the following elements of the physical environment:

- Climate
- Soils
- Geologic Hazards
- Public Health Hazards
- Energy Production and Consumption
- Water Resources
- Flora and Fauna
- Air Quality and Noise
- Environmentally Sensitive Areas

The 2009 WWMP/CIP states that little has changed in regards to the physical environment with exception to the installation of considerable wastewater treatment upgrades and the addition of water supply wells. It is assumed that other than minor changes, the physical environment of the City of Veneta has remained largely unchanged since the 2009 WWMP/CIP.

The 1997 WWFP profiled the City as a fast-growth town aiming to provide housing to accommodate a growing commercial/industrial section in the adjacent Eugene/Springfield area. The 2009 WWMP/CIP echoed the potential for growth outlined in the 1997 WWFP. The City's growth, however, has been largely flat (averaging 1.2% per year) since 2009, experiencing an increase in population from 4,400 to 4,721 in 2015. Again, the population projections and timelines used in the 2009 WWMP/CIP appear substantially overstated due to this lack of growth. In the case of a smaller town like Veneta, with ample room for development, population may be a better indicator of when upgrades to the wastewater system would be necessary. Rapid population expansion would typically come as new areas are developed.

6.1.3 2009 Collection System Summary

The 2009 WWMP/CIP used computer based hydraulic modeling to find how the collection system would respond to both 2009 and future flows. The modeling was based on a sewered population of 4,300 with a dry weather base flow of 70 gallons per capita per day (gpcpd). The 2009 report also has a peak hourly flow of 9.7 times the amount of the base flow at 680 gpcpd.

The modeling found several areas where the collection system would currently (2009) or in the near future experience overflowing manholes or other flow related problems. Many of the deficiencies listed in the 2009 WWMP/CIP have since been addressed and corrected by the City. The 2009 CIP was generated chiefly from this modeling to address deficiencies in the system. Many of the items on the CIP from 2009 are still valid, and can be adjusted to reflect population numbers rather than specific years to give a better estimation for project planning.

6.1.4 2009 Regulatory Criteria Summary

The 2009 WWMP/CIP gives an overview of current and anticipated DEQ regulatory criteria to establish design guidelines for future plant upgrades or expansions. The DEQ regulatory criteria is currently the same as it was for the Veneta Water Quality Permit in effect in 2009. It is assumed that the regulatory criteria would remain the same for Veneta in the future.

6.1.5 2009 Treatment Process Summary

The wastewater treatment plant has a design maximum BOD loading of 1243 lbs. per day. The plant influent BOD averages 965 lbs. per day, or about 78% of the design value. As shown in the DMR data from 2010 – 2015, BOD loading quite often exceeds the design value, many times by greater than twice the design value. Using the surge pond as a buffer, however, the plant has been able to consistently maintain effluent BOD well below DEQ permitted levels.

The 2009 WWMP/CIP analysis gave a date for expansion of the Biolac basins of 2014, correlating to a population approaching 6,000 by their estimation. This amendment calculates a similar population trigger number of 6,200 for the required upgrade to the wastewater treatment plant. Based on flow data, current population growth statistics, and the current layout/operation of the wastewater treatment plant; the influent pumping station, the headworks, surge basin, and the Biolac basins would be running at or over capacity during peak flows once the population reaches 6,200, which by current estimates, would occur in the year 2026.

Required wastewater treatment plant improvements noted in the 2009 WWMP/CIP were identified as; replacing the headworks screen, the addition of two Biolac basins, UV system expansion, and leaking aeration piping. With the exception of the Biolac basins, all of the wastewater treatment plant deficiencies have been addressed. With the expansion of the Biolac basins, modification to the headworks would also need to be done to incorporate a four-way flow splitter.

6.1.6 2009 Water Reuse Summary

The 2009 WWMP/CIP explores two alternatives for water reuse.

The first alternative was in use as secondary effluent spray applied irrigation for grass and poplar fields north of the wastewater treatment plant. At the time of the 2009 report, the City had expressed a desire to cease cultivation of poplar due to the plantation management costs. Since the 2009 report, the poplar plantation has been removed and replaced with grass.

The second alternative was to upgrade the quality of the effluent to a Class "A" reuse standard to qualify for application to agriculture, landscape, parks, playgrounds, school yards, or other areas that are accessible by the public. Since the 2009 report, the City has not needed to move forward with the Class "A" alternative.

6.1.7 2009 Capital Improvement Plan Summary

Many of the projects on the 2009 CIP have already been completed. With exception of the Class "A" water reuse projects, we feel that the remainder of the outstanding 2009 CIP projects that are in line with the current recommended Option 3 are still valid and should be budgeted for.

C7 from the 2009 CIP was for the addition of an east side lift station. Option 3 also calls for an east side lift station (Huston Road) to be built to accommodate development on the east side of town.

T2, T3, T4, T5, and T6 all relate to increasing the capacity of the wastewater treatment plant, and should also be complete prior to the population reaching 6200, or the year 2026.

T7, R3, R4, and R5 are based on the City expanding their water reuse program to include application of Class "A" water in town. The original intent of expanding the reuse program was to help the wastewater treatment plant in staying within permit compliance. Based on the most recent DMR data, the permit levels have been exceeded twice in six years, both times during the winter when the plant is experiencing high flows due to rainfall events. Therefore, reuse of water during the wintertime is really not feasible, as the intended application areas would be saturated with rainwater. Currently irrigation of the grass fields north of the wastewater treatment plant has been more than adequate to distribute the summertime effluent. We do not recommend expansion of the reuse system at this time.

The time frame for completing the remaining projects is highly dependent on the development of the town and again, is suggested to take place once the population hits 6200, or by the year 2026 if the city follows the projected trends without aggressive development.

6.2 Conveyance System Options

The alternatives in the 2009 study were generated to accommodate a projected doubling in population due to the economic climate in which the report was developed. Consequently, the 2009 alternatives are considered to err highly on the conservative side when compared with current Options.

Many components of the 2009 alternatives include upgrades to the existing gravity lines, which were designed to handle higher flows generated from new development. Routing flows generated from new development around the existing gravity system diminishes the need for the existing gravity system to be upsized. Alternatives in both 2009 and this report focus on extending service to the east side of town, where the City has future plans for development. In discussion with the City, there are two other areas besides the east side for potential growth, one being the commercial area on the northeast side of town and another area south of Bolton Hill Road and west of Territorial Highway.

Conveying wastewater from the east side of town would require at a minimum a new east lift station to be installed. The new east lift station can either pump straight to the wastewater treatment plant, or it can tie into the existing system. If the new east side lift station is to pump into the existing gravity system, presumably at Hunter Road, the existing gravity system would need to be upsized to handle the projected peak flows.

At a minimum, the Jeans Road lift station would need to be upgraded to overcome existing deficiencies in capacity prior to any new development in the Basin 6 service area.

6.2.1 Option 1 – Long Force Main and Two Lift Stations

This Option involves the installation of a new eastside lift station near Hunter Road and Huston Road and associated 13,400' force main that leads directly to the wastewater treatment plant. The force main would run north up Huston Road and head west along Highway 126. A rebuilt Jeans Road lift station force main would tee into this new force main at the southwest corner of Highway 126 and Territorial Highway. This option is very similar to the recommended alternative in the 2009 CIP, with the key difference being that the Pine Street lift station would not be attached to the new force main. See Table 6.2.

Option 1 - New Huston Road LS - New Jeans Road LS - 13,400' Force Main					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$314,670	$314,670
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	2	$15,000	$30,000
3	New Wetw ell and dew atering	EA	2	$95,000	$190,000
4	25 HP Pump, VFDs, Accessories and Installation (High Head)	EA	3	$50,000	$150,000
5	40 HP Pump, VFDs, Accessories and Installation (High Head)	EA	3	$75,000	$225,000
6	Electrical Controls and Instruments	LS	2	$60,000	$120,000
7	New 200A Electrical Service, Transformers, Sw itchgear	LS	2	$85,000	$170,000
8	New 100KW Generator & Transfer Sw itch	LS	1	$65,000	$65,000
9	New 60KW Generator & Transfer Sw itch	LS	1	$40,000	$40,000
10	Electrical & Generator Building, 252 sq ft, w /Dividing Wall & Rollup Door	LS	2	$90,000	$180,000
11	New Inlet Outlet Piping Tie Ins	LS	2	$30,000	$60,000
12	Site Piping, Valves, Fittings and Vault	LS	2	$45,000	$90,000
13	10" HDPE Force Main	LF	10600	$70	$742,000
14	10" HDPE Force Main - HDD	LF	2800	$250	$700,000
15	Site Work	LS	2	$10,000	$20,000
16	Demo Old Site	LS	2	$10,000	$20,000
17	Misc. Restoration and Clean Up	LS	2	$15,000	$30,000
		Construction Total			$3,146,670
		Contingency (20%)			$629,334
		Subtotal			$3,776,004
		Engineering (20%)			$755,201
		Land Acquisition			$225,000
		Environmental Report			$20,000
		Environmental Engineering*			$40,000
		Administrative Costs (3%)			$113,280
		Total Project Cost			**$4,929,485**

6.2.2 Option 2 – Two Force Mains and Two Lift Stations

Option 2 involves the installation of a new eastside lift station near Hunter Road and Huston Road and the rebuilding of the Jeans Road lift station. The Huston Road lift station force main would run north up Huston Road and then turn west to run along the north side of Highway 126 and then north again to Jeans Road where it would turn west again to tie into the existing gravity system at Jeans Road east of Hope Lane. This existing gravity system would need to be upgraded to 15" to handle total projected development in both Basin 6 and Basin 7. The Jeans Road lift station would be upgraded in capacity and redirected to run along the north side of Highway 126 towards the wastewater treatment plant. This option also relieves the existing gravity systems in both Basin 1 and Basin 2 of the Jeans Road force main input by redirecting the Jeans Road lift station output directly to the wastewater treatment plant by means of a 6,200' force main running west along the north side of Highway 126 and turning south just east of the wastewater treatment plant. The new lift station would require significant upgrades based on projected future loads in both Basin 6 and Basin 7. See Table 6.2.

Option 2 - New Huston Road LS - New Jeans Road LS - 11,700' of Force Mains - 3,200' Gravity					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$305,390	$305,390
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	2	$15,000	$30,000
3	New Wetwell and dewatering	EA	2	$80,000	$160,000
4	15 HP Pump, VFDs, Accessories and Installation	EA	3	$25,000	$75,000
5	25 HP Pump, VFDs, Accessories and Installation	EA	3	$35,000	$105,000
6	Electrical Controls and Instruments	LS	2	$40,000	$80,000
7	New 200A Electrical Service, Transformers, Switchgear	LS	2	$35,000	$70,000
8	New 80KW Generator & Transfer Switch	LS	1	$45,000	$45,000
9	New 50KW Generator & Transfer Switch	LS	1	$35,000	$35,000
10	Electrical & Generator Building, 252 sq ft, w/Dividing Wall & Rollup Door	LS	2	$90,000	$180,000
11	New Inlet Outlet Piping Tie Ins	LS	2	$30,000	$60,000
12	Wetwell Retrofitting	LS	1	$45,000	$45,000
13	Site Piping, Valves, Fittings and Vault	LS	1	$45,000	$45,000
14	10" HDPE Force Main	LF	4,000	$70	$280,000
15	10" HDPE Force Main - HDD	LF	1,500	$250	$375,000
16	12" HDPE Force Main	LF	4,850	$80	$388,000
17	12" HDPE Force Main - HDD	LF	1,350	$250	$337,500
18	15" PVC Gravity Sewer Piping	LF	3,200	$115	$368,000
19	Site Work	LS	2	$10,000	$20,000
20	Demo old site	LS	2	$10,000	$20,000
21	Misc. Restoration and Clean Up	LS	2	$15,000	$30,000
		Construction Total			$3,053,890
		Contingency (20%)			$610,778
		Subtotal			$3,664,668
		Engineering (20%)			$732,934
		Land Acquisition			$225,000
		Environmental Report			$20,000
		Environmental Engineering*			$40,000
		Administrative Costs (3%)			$109,940
		Total Project Cost			**$4,792,542**

6.2.3 Option 3 – Two Force Mains, Short Gravity Line and Two Lift Stations

Option 3 is the recommended option and is similar in design to Option 2, with the exception that the Jeans Road lift station is deleted and a new lift station is installed closer to the wastewater treatment plant near the intersection of 8th Street and Jack Kelly Drive. This new lift station is connected via gravity to the old Jeans Road lift station location by means of a new gravity line running between Jack Kelly drive and Highway 126 and making the connection by crossing under Highway 126 just west of Territorial Highway. The new lift station would feed a 3,900' force main leading to the headworks. The location of the western force main would require a horizontal directional dig installation for a portion of the length which would be done on city land and could possibly avoid potential conflicts with the railroad. This option also relieves existing gravity systems in both Basin 1 and Basin 2 by rerouting the Jeans Road force main directly to the wastewater treatment plant. This option has the advantage of providing sewer service to the Jack Kelly Drive area for future development. See Table 6.2.

Option 3 - New Huston Road LS - New Jack Kelly Drive LS - 9,400' of Force Mains - 5300' of Gravity					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$328,780	$328,780
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	2	$15,000	$30,000
3	New Wetwell and dewatering	EA	2	$80,000	$160,000
4	15 HP Pump, VFDs, Accessories and Installation	EA	3	$25,000	$75,000
5	25 HP Pump, VFDs, Accessories and Installation	EA	3	$35,000	$105,000
6	Electrical Controls and Instruments	LS	2	$40,000	$80,000
7	New 200A Electrical Service, Transformers, Switchgear	LS	2	$35,000	$70,000
8	New 80KW Generator & Transfer Switch	LS	1	$45,000	$45,000
9	New 50KW Generator & Transfer Switch	LS	1	$35,000	$35,000
10	Electrical & Generator Building, 252 sq ft, w/Dividing Wall & Rollup Door	LS	2	$90,000	$180,000
11	New Inlet Outlet Piping Tie Ins	LS	2	$30,000	$60,000
12	Site Piping, Valves, Fittings and Vault	LS	2	$45,000	$90,000
13	10" HDPE Force Main	LF	4,000	$70	$280,000
14	10" HDPE Force Main - HDD	LF	1,500	$250	$375,000
15	12" HPDE Force Main	LF	2,700	$80	$216,000
16	12" HPDE Force Main - HDD	LF	1,200	$250	$300,000
17	15" PVC Gravity Sewer Piping	LF	3,200	$115	$368,000
18	15" PVC Gravity Sewer Piping - Deep	LF	2,100	$200	$420,000
19	Site Work	LS	2	$10,000	$20,000
20	Demo old site	LS	2	$10,000	$20,000
21	Misc. Restoration and Clean Up	LS	2	$15,000	$30,000
		Construction Total			$3,287,780
		Contingency (20%)			$657,556
		Subtotal			$3,945,336
		Engineering (20%)			$789,067
		Land Acquisition			$75,000
		Environmental Report			$20,000
		Environmental Engineering*			$40,000
		Administrative Costs (3%)			$118,360
		Total Project Cost			**$4,987,763**

6.2.4 Option 4 – Two Force Mains, Long Gravity Line and Two Lift Stations

This Option is essentially the same as Option 3, with the exception of the locations of both the added gravity line and the added lift station. The new gravity line with run along the north side of Highway 126 from the location of the deleted Jeans Road lift station to the new lift station location approximately 3,800' to the west, between the poplar grove and Highway 126. The gravity line would tie in under Highway 126 to service the Jack Kelly Drive area. The lift station would then connect to the wastewater treatment plant via a 2,700' force main. The location of the western force main would require a horizontal directional dig installation which would be done on city land and could possibly avoid potential conflicts with either the railroad or the highway. This option also relieves existing gravity systems in both Basin 1 and Basin 2 by rerouting the Jeans Road force main directly to the wastewater treatment plant. See Table 6.2.

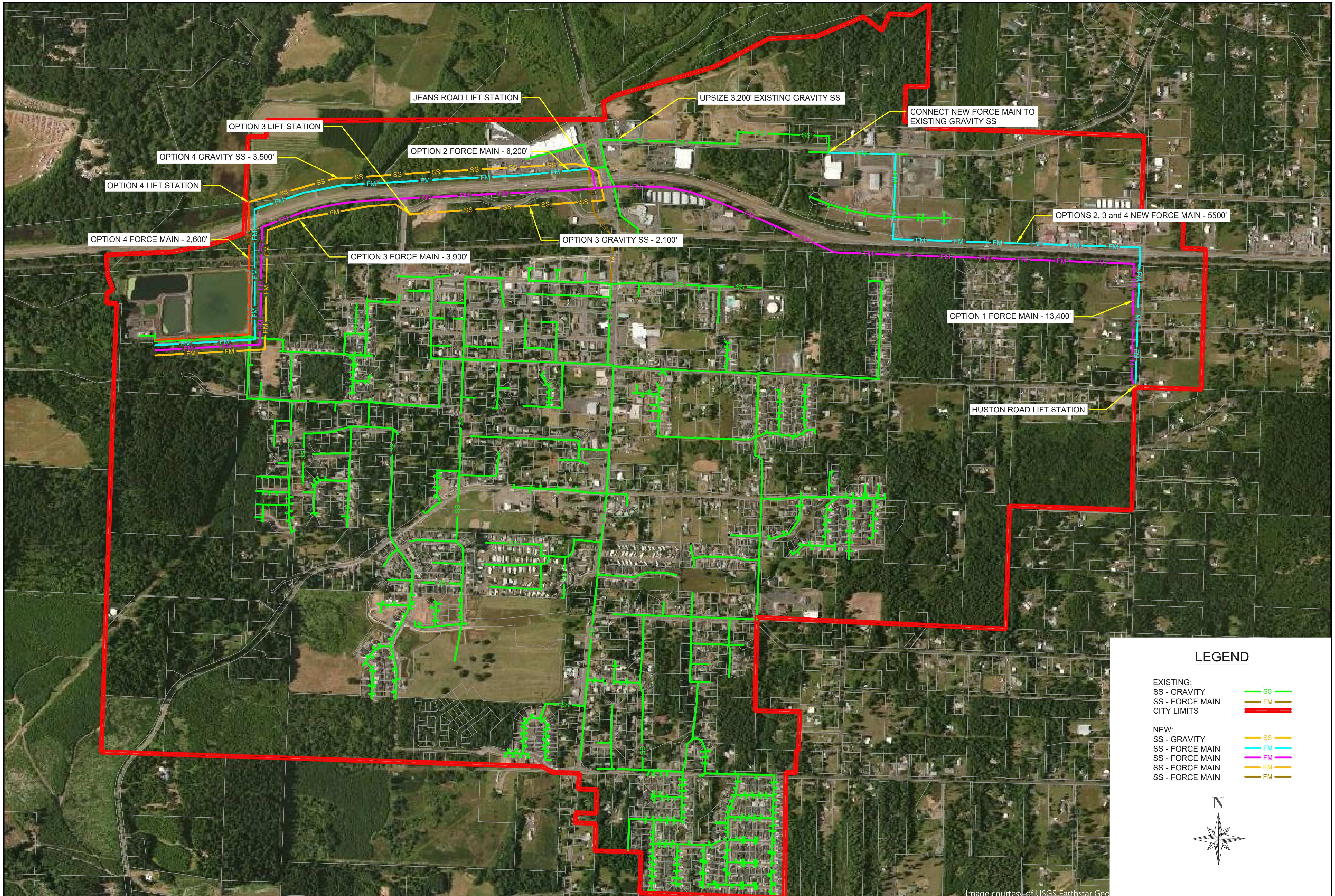
Option 4 - New Huston Road LS - New Hwy 126 LS - 8,100' Force mains - 6,700' Gravity					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$351,170	$351,170
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	2	$15,000	$30,000
3	New Wetwell and dewatering	EA	2	$80,000	$160,000
4	15 HP Pump, VFDs, Accessories and Installation	EA	3	$25,000	$75,000
5	25 HP Pump, VFDs, Accessories and Installation	EA	3	$35,000	$105,000
6	Electrical Controls and Instruments	LS	2	$40,000	$80,000
7	New 200A Electrical Service, Transformers, Switchgear	LS	2	$35,000	$70,000
8	New 80KW Generator & Transfer Switch	LS	1	$45,000	$45,000
9	New 50KW Generator & Transfer Switch	LS	1	$35,000	$35,000
10	Electrical & Generator Building, 252 sq ft, w/Dividing Wall & Rollup Door	LS	2	$90,000	$180,000
11	New Inlet outlet piping tie ins	LS	2	$30,000	$60,000
12	Wetwell Retrofitting	LS	1	$45,000	$45,000
13	Site Piping, Valves, Fittings and Vault	LS	1	$45,000	$45,000
14	10" HDPE Force Main	LF	4,000	$70	$280,000
15	10" HDPE Force Main - HDD	LF	1,500	$250	$375,000
16	12" HPDE Force Main	LF	1,250	$80	$100,000
17	12" HPDE Force Main - HDD	LF	1,350	$250	$337,500
18	15" PVC Gravity Sewer Piping	LF	3,200	$115	$368,000
19	15" PVC Gravity Sewer Piping - Deep	LF	3,500	$200	$700,000
20	Site Work	LS	2	$10,000	$20,000
21	Demo Old Site	LS	2	$10,000	$20,000
22	Misc. Restoration and Clean Up	LS	2	$15,000	$30,000
		Construction Total			$3,511,670
		Contingency (20%)			$702,334
		Subtotal			$4,214,004
		Engineering (20%)			$842,801
		Land Acquisition			$75,000
		Environmental Report			$20,000
		Environmental Engineering*			$40,000
		Administrative Costs (3%)			$126,420
		Total Project Cost			**$5,318,225**

6.2.5 Option 5 – Do Nothing

This Option would not rebuild any new lift stations nor install any new pipes. This Option has the advantage of having the least construction cost. The disadvantages to this Option is that it would not provide sewer service to newly developed areas, nor would it provide possible service to properties currently using septic systems in the city, nor would it keep the current lift stations compliant with DEQ's redundancy requirements.

This Option would not relieve existing gravity systems in both Basin 1 and Basin 2 of the loads coming from the Jeans Road lift station.

This Option would likely result in increasing violations of the NPDES permit.



Civil West Engineering Services, Inc.

CITY OF VENETA
LANE COUNTY, OREGON

CONVEYANCE SYSTEM OPTIONS

WASTEWATER CONVEYANCE SYSTEM

1" = 1000'

DRAWN BY: DCV
DATE: MAY 2016

FIGURE
6.2

Option	Comparison to 2009	Cost	Advantages	Disadvantages
1 - 13,400' force main and eastside lift station	Option 1 is closest to the 2009 Alternative in that it uses a force main to channel most of the potential new development flows directly to the treatment plant, rather than through the existing gravity system. Option 1 also redirects the Jeans Road lift station effluent to the force main, relieving Basins 1 and 2 of the loads from the north side of the highway. The 2009 Alternative goes a step further and adds another lift station to the northeast corner of town and tees into the east lift station's force main.	- $4.9M	- Shallow excavation for force main yields a reduced cost vs options that employ gravity sewer lines - Single force main, lowest capital cost of installation - Wastewater is only pumped once - Relieves Basin 1 and Basin 2 of Jeans Road lift station load - Uses smaller force main than the other options	- Does not add sewer service to potential development in extreme north corner of town - Multiple pumps into a single force main is overly complex and requires significant additional control logic and wet well sizing - Jeans Road lift station will be difficult/expensive to rebuild in current location
2 - Two force mains (11,700' total), 3,200' of gravity, lift station upgrade and new eastside lift station	Option 2 employs a force main from the new east side lift station and upgrades the Jeans Road lift station to feed a 6,200' force main straight to the treatment plant. It is similar to the 2009 Alternative, but upgrades the gravity system in Jeans Road to both; use a shorter length of force main, and to provide for easier future connection to development in the Jeans Road area (East Basin 6).	- $4.8M	- Shallow excavation for force main yields a reduced cost vs options that employ gravity sewer lines - Significant upgrade to Jeans Road lift station - Easier to tie into for future development - Shorter force main - Relieves Basin 1 and Basin 2 of Jeans Road lift station load - Cheapest option other than "Do nothing"	- Does not allow for future growth in the Jack Kelly Drive area without adding a small local lift station - Jeans Road lift station will be difficult/expensive to rebuild in current location - Pumps wastewater twice - Possible property acquisition issue for Lift Station - Need to upsize existing Jeans Road gravity main
3 - Two force mains (9,400' total), two new lift stations and 5,300' of gravity line	Option 3 is similar to Option 2 with the east lift station force main tie in to the Jeans Road gravity system, but also adds a new gravity system from the deleted Jeans Road lift station to the new lift station near 8th and Jack Kelly Drive. The new lift station is connected to the treatment plant by a 2,900' force main. Option 3 has the advantage of providing service to the Jack Kelly Drive area.	- $5.0M	- Short force main - Allows for future growth on the east side, the northeast side and the Jack Kelly Drive area - Possible increase in revenue if commercial development is built in JKD area - Relieves Basin 1 and Basin 2 of Jeans Road lift station load	- Potentially 2nd highest initial cost - West side force main runs along RR, possible conflict with RR - Pumps wastewater twice - Need to upsize existing Jeans Road gravity main - ~13' deep excavation required on west end of run for new gravity main
4 - Two force mains (5,600' total), two new lift stations and 6,700' of gravity line	Option 4 takes the gravity line at the Jeans Road lift station and runs it 3,500' down the north side of Highway 126 to the south side to the old poplar fields, there a lift station is built the feeds a short force main running south under Highway 126 directly to the treatment plant. Future development at Jack Kelly Drive would require installation of a gravity line under Highway 126 to tie into the 3,500' gravity line.	- $5.3M	- Shortest force main - Allows for future growth on the east side, the northeast side and the Jack Kelly Drive area - Possible increase in revenue if commercial development is built in JKD area - Relieves Basin 1 and Basin 2 of Jeans Road lift station load - Most construction is on City land, avoiding conflicts with ODOT/RR	- Potentially highest initial cost - Pumps wastewater twice - Need to upsize Jeans Road gravity main - May require HDD - ~15' deep excavation required on west end of run for new gravity main
5 - Do nothing	Option 5 is the option of doing nothing.	- $0.0M	- Cheapest option	- Flow capacity is not increased - Does not allow for any future growth

6.3 Extension of Conveyance System to Areas Currently Not Serviced with Sewer

All of the above Options are focused on extension of sewer service to under developed areas in the town that are primed for growth. These areas are, the area north of the railroad tracks (Basin 6) and the area on the east side of town (Basin 7). If the central existing gravity system is to be used for conveyance from the new areas, capacity upgrades to the main existing gravity “trunk lines” would be required. The major trunks of the existing gravity system are in many of the more heavily trafficked areas in the town, which would cause significant impact to the public if a traditional open trench method of pipe replacement were used. If possible, the technology known as “pipe bursting” maybe be employed in these areas to diminish construction activity impacts to the public.

The Basin 6 area is serviced by the Jeans Road lift station and feeds into the existing gravity system. Development in Basin 6 would require upgrading the Jeans Road lift station and also has the potential for overloading the central gravity system. Routing the Basin 6 sewer shed via force main and/or gravity directly to the wastewater treatment plant would both alleviate overloading the central gravity system, and allow for more development in the Basin 6 area.

As soon as development in the Basin 7 area (east side of town) begins, so would the need to extend sewer service to this area. Topography requires a pumping station to extend service to the east side of town. Based on our recommendations, the extension of service to Basin 7 is separate from the existing gravity system to avoid further taxing it with new loads.

6.4 Lift Station Options

As described in section 3.3.8, there are two lift stations within the collection area of the City (a third being the influent lift station at the treatment plant). The designed firm capacity of the Jeans Road lift station is 130 gpm, and the Pine Street lift station has a designed firm capacity of 350 gpm. Neither the Jeans Road nor the Pine Street lift station are adequate for handling the projected PIF.

The Jeans Road lift station services Basin 6, the large commercial/mixed area north of the railroad tracks. We foresee that this area would develop at a density of approximately one-third that of the other basins. Based on this analysis, the area serviced by Jeans Road would have a projected PIF of 290 gpm, over twice its current designed firm capacity. Based on this analysis, the lift station would need to be upgraded to handle projected peak flows.

The area that the Pine Street lift station services an approximate 570 connections out of 1730 estimated total connections for the City. This gives the Pine Street lift station approximately 1/3 of the City's wastewater flow. At the current peak instantaneous flow, the Pine Street lift station has a current peak flow of 685 gpm, almost twice its current designed firm capacity of 350 gpm. End of design period peak flow for this lift station would be 795 gpm. Based on this analysis, the lift station would need to be upgraded to handle both current and projected peak flows.

The above scenarios are based on current sewer sheds, and do not reflect any potential future connections to any new development outside of the current service basin.

6.4.1 Upgrade Lift Stations

Upgrading the Jeans Road lift station would reuse and retrofit the existing infrastructure, with replacement of the existing pumps, connection modifications and associated electrical. Total cost for this upgrade should be $107,000. This option should only be used in the case the Jeans Road lift station is not rebuilt in the near future as part of project CWC1.

CWC3 - Jeans Road Pump Upgrades					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$7,220	$7,220
2	15HP Pumps	EA	2	$8,000	$16,000
3	VFD/Controls	EA	2	$2,000	$4,000
4	Electrical	LS	1	$30,000	$30,000
5	Labor	LS	1	$15,000	$15,000
		Construction Total			$72,220
		Contingency (20%)			$14,444
		Subtotal			$86,664
		Engineering (20%)			$17,333
		Administrative Costs (3%)			$2,600
		Total Project Cost			**$106,597**

Upgrading Pine Street lift station would reuse and retrofit the existing infrastructure, with replacement of the existing pumps, connection modifications and associated electrical. Total cost for this upgrade should be $54,000. This is the recommended option for the Pine Street lift station as a simple upgrade in pumping capacity is all that is required at this location.

CWC2 - Pine Street Pump Upgrades					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$3,670	$3,670
2	12HP Pumps	EA	2	$5,000	$10,000
3	VFD/Controls	EA	2	$1,500	$3,000
4	Electrical	LS	1	$20,000	$20,000
		Construction Total			$36,670
		Contingency (20%)			$7,334
		Subtotal			$44,004
		Engineering (20%)			$8,801
		Administrative Costs (3%)			$1,320
		Total Project Cost			**$54,125**

6.4.2 Replace Lift Stations

The recommended conveyance option, Option 3, would replace and relocate the Jeans Road lift station. Replacement of the Pine Street lift station was not considered, as it is fairly new, and already located in an advantageous location. The new Jack Kelly Drive lift station, force main, and gravity line is estimated to cost $3,051,365. The new Huston Road lift station and force main is estimated to cost $1,996,398.

Replace/Relocate Jeans Road LS to Jack Kelly Drive - Conveyance Option 3					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$202,670	$202,670
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	1	$15,000	$15,000
3	New Wetwell and dewatering	EA	1	$80,000	$80,000
4	25 HP Pump, VFDs, Accessories and Installation	EA	3	$35,000	$105,000
5	Electrical Controls and Instruments	LS	1	$40,000	$40,000
6	New 200A Electrical Service, Transformers, Switchgear	LS	1	$35,000	$35,000
7	New 80KW Generator & Transfer Switch	LS	1	$45,000	$45,000
8	Electrical & Generator Building, 252 sq ft, w/Dividing Wall & Rollup Door	LS	1	$90,000	$90,000
9	New Inlet Outlet Piping Tie Ins	LS	1	$30,000	$30,000
10	Site Piping, Valves, Fittings and Vault	LS	1	$45,000	$45,000
11	12" HPDE Force Main	LF	2,700	$80	$216,000
12	12" HPDE Force Main - HDD	LF	1,200	$250	$300,000
13	15" PVC Gravity Sewer Piping	LF	3,200	$115	$368,000
14	15" PVC Gravity Sewer Piping - Deep	LF	2,100	$200	$420,000
15	Site Work	LS	1	$10,000	$10,000
16	Demo old site	LS	1	$10,000	$10,000
17	Misc. Restoration and Clean Up	LS	1	$15,000	$15,000
		Construction Total			$2,026,670
		Contingency (20%)			$405,334
		Subtotal			$2,432,004
		Engineering (20%)			$486,401
		Environmental Report			$20,000
		Environmental Engineering*			$40,000
		Administrative Costs (3%)			$72,960
		Total Project Cost			**$3,051,365**

New Huston Road LS - 5,500' of 10" Force Main - Conveyance Options 2,3, and 4					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$126,110	$126,110
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	1	$15,000	$15,000
3	New Wetw ell and dew atering	EA	1	$80,000	$80,000
4	15 HP Pump, VFDs, Accessories and Installation	EA	3	$25,000	$75,000
5	Electrical Controls and Instruments	LS	1	$40,000	$40,000
6	New 200A Electrical Service, Transformers, Sw itchgear	LS	1	$35,000	$35,000
7	New 50KW Generator & Transfer Sw itch	LS	1	$35,000	$35,000
8	Electrical & Generator Building, 252 sq ft, w /Dividing Wall & Rollup Door	LS	1	$90,000	$90,000
9	New Inlet Outlet Piping Tie Ins	LS	1	$30,000	$30,000
10	Site Piping, Valves, Fittings and Vault	LS	1	$45,000	$45,000
11	10" HDPE Force Main	LF	4,000	$70	$280,000
12	10" HDPE Force Main - HDD	LF	1,500	$250	$375,000
13	Site Work	LS	1	$10,000	$10,000
14	Demo old site	LS	1	$10,000	$10,000
15	Misc. Restoration and Clean Up	LS	1	$15,000	$15,000
		Construction Total			$1,261,110
		Contingency (20%)			$252,222
		Subtotal			$1,513,332
		Engineering (20%)			$302,666
		Land Acquisition			$75,000
		Environmental Report			$20,000
		Environmental Engineering*			$40,000
		Administrative Costs (3%)			$45,400
		Total Project Cost			**$1,996,398**

6.4.3 Lift Station Summation and Recommendations

The 2009 WWMP/CIP Alternative 1 calls for extensive modifications to the collection system, namely, upgrades to current lift stations, the addition of two new lift stations and a considerable amount of force main conveyance, much of which is connected hydraulically to other force main systems. This WWMP Update differs from the recommended option in the 2009 WWMP in that a total of 3 lift stations instead of 4 are recommended, and there is no shared force main. Keeping the force mains hydraulically isolated has the advantage of running smaller pumps and makes for easier equipment maintenance.

Option 3 of the 2016 Amendment would:

- Add a new (Jack Kelly Drive) lift station to serve Basins 6 and 7
- Add a new (Huston Road) lift station to service Basin 7
- Relieve the central gravity system of Basin 6 and 7 flows

6.5 Wastewater Treatment Plant Options

The wastewater treatment plant would need to have the capacity to handle peak flows of 3.6 MGD projected to occur in 2035. In the current configuration, peak flows in 2026 would exceed the capacity of the wastewater treatment plant and current surge basin. Upgrading to a larger headworks, a second pair of Biolac basins, and possibly a larger surge basin would allow the wastewater treatment plant to perform at projected peak flows in 2035.

During the study period it has been noted that the effluent values for TSS loading have exceeded the permit levels on two occasions. Although this is a rare occurrence, we feel that some effort must be made to plan to keep effluent levels within the permitted values.

6.5.1 Influent Lift Station

The current Wastewater Treatment Plant has a Class 1 rated design capacity of 1.25 MGD. Over the 5-year study period the 1.25 MGD design capacity has been exceeded 72 times, many of the flows were close to double the 1.25 MGD capacity. To alleviate demand on the existing influent lift station, the headworks would be modified to accept direct flows from the two new force mains, one from the new Jeans Road lift station, and one from the new Huston Road lift station. Projected peak hourly flows for the year 2036 would exceed 3.5 MGD.

6.5.2 Surge Basin

The wastewater treatment plant has been able to operate within allotted permit levels by the use of a 4-million-gallon surge pond. The surge pond is connected to the influent pumping station, when flows exceed the 1.25 MGD capacity of the influent lift station, the influent level in the wetwell rises and is diverted to the surge pond. Later, flows diverted to the surge pond would then flow back into the wetwell once the levels in the wetwell drop below the capacity of the influent pump.

6.5.3 Headworks

The headworks would need to either be replaced or modified to handle the increased flows. The headworks would also need to be modified to accept direct flows from the proposed new Jeans Road lift station. The flow splitter box would also need to be changed out to accommodate a four-way splitter to feed the new (4) basin Biolac system.

6.5.4 Biolac Basin Expansion

Prior to the population increasing to 6200, it is recommended that both the influent pumping station and the Biolac basins be upgraded to handle the projected flows. The existing (2) Biolac aeration basins would need to be expanded to a (4) basin system. The two new Biolac basins would be located where the current FSL is located. The headworks would also need to either be replaced or modified to handle the increased flows and in particular, the flow splitting to accommodate the new (4) basin Biolac. Below is the cost estimate for the Biolac expansion project.

BIOLAC Expansion					
Item	Description	Units	Quantity	Unit Cost	Total Cost
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$163,400	$163,400
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	1	$7,500	$7,500
3	Concrete Work	EA	1	$250,000	$250,000
4	BIOLAC and Related Parts, Shipping	LS	1	$975,000	$975,000
5	Pavement	TON	80	$110	$8,800
6	Site Work	LS	1	$5,000	$5,000
7	Demo and Import Fill	LS	1	$223,000	$223,000
8	Misc. Restoration and Clean Up	LS	1	$7,500	$7,500
		Construction Total			$1,640,200
		Contingency (20%)			$328,040
		Subtotal			$1,968,240
		Engineering (20%)			$393,648
		Environmental Report			$10,000
		Environmental Engineering*			$20,000
		Administrative Costs (3%)			$59,047
		Total Project Cost			**$2,450,935**

6.5.5 Effluent Flow Splitter – Disk Filter

Two instances were found in six years of DMRs, where the effluent TSS loading values were exceeding permitted values. These outlier values are presently not cause for great concern, but should be addressed in the future if they become more frequent. In order to address high values of TSS loading, an effluent splitter box and disk filter are recommended. Typically, high flows due to large rain events or heavy influent flows (when both influent screws are running) have shown the potential to exceed permit levels for TSS loading. The splitter box would be of an overflow weir type and route flows exceeding 1.0 MGD to an integrated disk filter that would significantly reduce both TSS and BOD loading during high flow events.

The effluent sampling location would need to be moved and approved by DEQ from just after the UV disinfection system to after the effluent splitter/disk filter.

Wastewater Treatment Plant - Splitter and Disk Filter System					
Item	Description	Units	Quantity	Unit Cost	Total Cost
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$26,040	$26,040
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	1	$2,500	$2,500
3	Concrete Work	EA	1	$33,000	$33,000
4	Disk Filter and Related Parts, Shipping	LS	1	$135,000	$135,000
5	SCADA and Electrical	LS	1	$60,000	$60,000
6	Site Work	LS	1	$1,400	$1,400
7	Misc. Restoration and Clean Up	LS	1	$2,500	$2,500
		Construction Total			$260,440
		Contingency (20%)			$52,088
		Subtotal			$312,528
		Engineering (20%)			$62,506
		Administrative Costs (3%)			$9,376
		Total Project Cost			**$384,409**

6.5.6 Wastewater Treatment Summation and Recommendations

Chronologically, the upgrades to the wastewater treatment plant should be done in support of the Biolac basin expansion.

- First, the headworks should be upgraded to: handle greater flows, accept flows from the new Jack Kelly Drive lift station force main, and be able to split the influent for the future four Biolac basin system.
- Second, the facultative sludge lagoons should be relocated.
- Third, the new Biolac basins should be constructed and then brought online.

Table 6.5.1 below shows the cost estimate for the proposed wastewater treatment plant upgrades.

Table 6.5.1: Wastewater Treatment Upgrades Cost Estimate

Wastewater Treatment Plant - Biolacs -FSLs - Headworks - Outfall					
Item	**Description**	**Units**	**Quantity**	**Unit Cost**	**Total Cost**
1	Mobilization, Insurance, Overhead, Bonds (10%)	LS	1	$234,870	$234,870
2	Construction Facilities, Temporary Systems and Bypass Provisions	LS	4	$7,500	$30,000
3	Concrete Work	EA	1	$330,000	$330,000
4	BIOLAC and Related Parts, Shipping	LS	1	$975,000	$975,000
5	Pavement	TON	80	$110	$8,800
6	Site Work	LS	4	$5,000	$20,000
7	Demo and Import Fill	LS	1	$720,000	$720,000
8	Misc. Restoration and Clean Up	LS	4	$7,500	$30,000
		Construction Total			$2,348,670
		Contingency (20%)			$469,734
		Subtotal			$2,818,404
		Engineering (20%)			$563,681
		Environmental Report			$20,000
		Environmental Engineering*			$40,000
		Administrative Costs (3%)			$84,552
		Total Project Cost			**$3,526,637**

6.6 Basis for Cost Estimates

6.6.1 Cost Estimate Components

The cost estimates presented in this report will typically include four components: construction cost, engineering cost, contingency, and legal and administrative costs. Each of the cost components is discussed in this section. The estimates presented herein are preliminary and are based on the level and detail of planning presented in this Study. The goal of these planning level cost estimates is to establish a reasonably conservative budget and to allow fair cost-comparisons of options. As projects proceed and more detailed, site-specific information becomes available, the estimates will require updating.

6.6.2 Construction Costs

Construction costs are based on competitive bidding as public works projects with Davis-Bacon prevailing wage rates. The estimated construction costs in this report are based on actual construction bidding results from similar work, published cost guides, budget quotes obtained from equipment suppliers, and other construction cost experience. Construction costs are preliminary budget level estimates prepared without design plans and details.

Future changes in the cost of labor, equipment, and materials may justify comparable changes in the cost estimates presented herein. For this reason, common engineering practices usually tie the cost estimates to a particular index that varies in proportion to long-term changes in the national economy. The Engineering News Record (ENR) construction cost index (CCI) is most commonly used. This index is based on the value of 100 for the year 1913. Average yearly values for the past 14 years are summarized in Table 6.6.2 below.

Table 6.6.2: ENR Construction Cost Index History

Year	Index	% Change/Year
2000	6221	2.67
2001	6343	1.96
2002	6538	3.07
2003	6694	2.39
2004	7115	6.29
2005	7446	4.65
2006	7751	4.10
2007	7967	2.78
2008	8310	4.31
2009	8570	3.13
2010	8801	2.69
2011	9070	3.06
2012	9309	2.64
2013	9547	2.51
2014	9806	2.64
	Average	3.30%

Cost estimates presented in this report are based on average 2016 dollars with an ENR CCI of 10280. For construction performed in later years, estimated costs should be projected based on the then current year ENR Index using the following method:

Updated Cost = Report Cost Estimate x (current ENR CCI / 10280)

6.6.3 Contingencies

A contingency factor equal to approximately twenty percent (20%) of the estimated construction cost has been added to the budgetary costs estimated in this report. In recognition that the cost estimates presented are based on conceptual planning, allowances must be made for variations in final quantities, bidding market conditions, adverse construction conditions, unanticipated specialized investigation and studies, and other difficulties which cannot be foreseen at this time but may tend to increase final costs. Upon final design completion of any project, the contingency can be reduced to 10%. A contingency of at least 10% should always be maintained going into a construction project to allow for variances in quantities of materials and unforeseen conditions.

6.6.4 Engineering

Engineering services for major projects typically include surveying, preliminary and final design, preparation of contract/construction drawings and specifications, bidding services, construction management, inspection, construction staking, start-up services, and the preparation of operation and maintenance manuals. Depending on the size and type of project, engineering costs may range from 18 to 25% of the contract cost when all of the above services are provided. The lower percentage applies to large projects without complicated mechanical systems. The higher percentage applies to small or complicated projects.

Engineering costs for basic design and construction services presented in this report are estimated at 20% of the estimated total construction cost. Other engineering costs such as specialized geotechnical explorations, hydro-geologic studies, easement research and preparation, pre-design reports, and other services outside the normal basic services would typically be in addition to the basic engineering fees charged by firms. When it was suspected that a specific project in this report may need any special engineering services, an effort has been made to include additional budget costs for such needs. Specific efforts required for individual basic engineering tasks such as surveying, design, construction management, etc. vary widely depending on the type of project, scheduling and timeframes, level of service desired during construction, and other project/site-specific conditions however an approximate breakdown of the 20% engineering budget is as follows:

Surveying and Data Collection – 0.5%
Civil/Mechanical Design – 8%
Electrical/Controls Design – 1.5%
Bid Phase Services – 1%
Construction Management – 4%
Construction Observation (Inspection) – 5%

6.6.5 Legal and Management

An allowance of five percent (5%) of construction cost has been added for legal and other project management services. This allowance is intended to include internal project planning and budgeting, funding program management, interest on interim loan financing, legal review fees, advertising costs, wage rate monitoring, and other related expenses associated with the project that could be incurred.

6.6.6 Land Acquisition

Construction of new lift stations may incur land acquisition costs dependent upon their location. Based on current property lot values in Lane County, and specifically the Veneta area, we are estimating land acquisition costs in two areas. The area near the current Jeans Road lift station has an estimated cost of $150,000 for a 0.3-acre lot. The area near Hunter and Huston road is estimated to be approximately $75,000 for a 0.3-acre lot.

7 Recommended CIP

This section is intended as an update to the 2009 CIP, updating the existing CIP and integrating new projects using current population and wastewater data to build a more accurate CIP for 2016. Many of the 2009 CIP projects have been completed, and several are still viable and are included in the 2016 update. Each capital project is provided with a number, the 2009 projects would keep the same number and lettering scheme where "C" designates a collection project, "T" is a treatment plant project, and "R" is referring to a water reuse project. New projects added to the CIP by this update would follow the same naming convention with a "CW" prefix.

7.1 Capital Improvement Plan

The recommended capital improvements are described in chapter 6. The costs shown in the table represent total estimates of costs and include construction, engineering, contingency and administrative costs. In general, each project is spread over two years with the recommendation that the engineering be authorized in the first year with the construction authorization in the second year. See the Capital Improvement Plan comparison in table 7.1 at the end of this section.

7.1.1 Collection System Projects

The recommended Collection System Option 3 would allow for development to take place in the Jack Kelly Drive area. The City has expressed the desire for sewer service in this area for possible future commercial development. Option 3 is not the least expensive option up front, but revenue from the development opportunities may make it the most fiscally sound option long term.

Several items from the 2009 CIP have been completed, and some are not viable for the new CIP and will not be discussed. This section reviews conveyance system elements discussed in Section 6.1.

Project CWC1 - 2017:

This project builds the new Jack Kelly Drive lift station to handle future peak flows and service to the Jack Kelly Drive area. This project provides for a new lift station, 2,900' of 12" force main, 2,100' of new 15" gravity line, and the upgrading of 3,200' of existing gravity sewer to 15". The Jeans Road lift station is near capacity with the current pumps. Should any sizable development occur in Basin 6 prior to the construction of the Jack Kelly Drive lift station, at a bare minimum, the lift station pumps at Jeans Road would need to be upgraded to handle peak flows. The new Jack Kelly Drive lift station is sized to accommodate the projected peak flows from Basins 6 and 7.

Project CWC2 - 2017:

This project provides for the upgrading of the pumping system at the Pine Street lift station to meet current DEQ requirements, and to handle future flows. At the current peak instantaneous flow, the Pine Street lift station has a current peak flow of 685 gpm, almost twice its current designed firm capacity of 350 gpm. End of design period peak flow for this lift station would be 795 gpm. Based on this analysis, the lift station would need to be upgraded to handle both current and projected peak flows. The Pine Street lift station is near capacity with the current pumps. New development would accelerate the need for capacity upgrades, and possibly necessitate the need for gravity infrastructure upgrades downstream from the lift station should the development be of sufficient magnitude.

Project CWC3 - 2017:

This project provides for the upgrading of the pumping system at the Jeans Road lift station to meet DEQ requirements. The Jeans Road lift station services Basin 6, the large commercial/mixed area north of the railroad tracks. We foresee that this area would develop at a density of approximately one-third that of the other basins. The firm design capacity for the Jeans Road lift station is 130 gpm which is inadequate for the current calculated PIF of 215 gpm for the service area. Based on this analysis, the area serviced by Jeans Road would have a projected PIF of 290 gpm, over twice its current designed firm capacity of 130 gpm. Jeans Road lift station does not currently meet the redundancy requirements as outlined by the Department of Environmental Quality. New pumps should be installed which would increase the capacity of the lift station to meet the required standards. Note, if CWC1 occurs prior to CWC3, then CWC3 is not necessary.

Project CWC4 – 2019:

This project provides for the construction of the east side lift station and 5,550' of 10" force main. The lift station would be built near the intersection of Huston Road and Hunter Road. The force main would run north up Hunter Road and turn west at Highway 126. The force main would then turn north at Cornerstone Drive, and then ~400' west down Jeans Road to make the connection to the existing gravity system. The existing gravity system in Jeans Road would have to be upgraded in size to 15" as a part of CWC1. This project is scheduled for design to begin in 2019 and construction 2020, and may be accelerated or delayed based on the degree of urgency for development in the east side of the City.

7.1.2 Wastewater Treatment Plant Projects

This section reviews current wastewater treatment plant options discussed in Section 6.5, which shares some elements with the Alternatives from the 2009 CIP, but some have been completed, and some are not viable for the new CIP and will not be discussed.

Project CWT1 - 2017:

The current treatment plant outfall is a simple 18" pipe discharging effluent into the Long Tom River. This method does not produce adequate mixing. It is recommended that the outfall be fitted with a diffusing manifold to enhance mixing of the effluent.

Project CWT2 - 2020:

Two instances were found in six years of DMRs, where the effluent TSS loading values were exceeding permitted values. These outlier values are presently not cause for great concern, but should be addressed in the future if they become more frequent. In order to address high values of TSS loading, an effluent splitter box and disk filter is recommended. Typically, high flows due to large rain events or heavy influent flows (when both influent screws are running) have shown the potential to exceed permit levels for TSS loading. The splitter box would be of an overflow weir type and route flows exceeding 1.0 MGD to an integrated disk filter that would significantly reduce both TSS and BOD loading during high flow events.

Project T3 – 2022:

This project is partially completed in that a new headworks screen has been installed at the wastewater treatment plant. Upgrades to the headworks to accommodate larger flows generated by future upgrades to the collection system have yet to be calculated nor designed for.

Project T4 – 2021:

This project involves the abandonment the existing facultative sludge lagoons and the construction of two new lagoons to the east of the existing plant. This project needs to be completed to make room for the two new aeration basins.

Project T5 – 2022:

This project provides the design and installation of the two new Biolac aeration basins. Both projects T3 and T4 should be completed in preparation for this project.

Table 7.1: 2009/2016 CIP Comparison

2009 CIP Projects	Description/Status	2016 CIP Projects	Description/Status
C1 - 2009	Completed		
C2 - 2010	Completed		
C3 - 2013	Part of CWC1	CWC1 - 2017	New Jack Kelly Drive Lift Station and Force Main*
C4 - 2017	Not viable for recommended Option		
C5 - 2021	Not viable for recommended Option		
C6 - 2017	Not viable for recommended Option		
C7 - 2015	Similar to CWC4	CWC4 - 2019	New Huston Road Lift Station and Force Main
C8 - 2021	Not viable for recommended Option		
C9 - 2021	Not viable for recommended Option		
C10 - 2013	Part of CWC1		
C11 - 2013	Part of CWC1		
C12 - 2012	Completed		
C13 - 2029	Not necessary		
T1 – 2009	Completed		
T2 – 2010	Design included in other projects		
T3 – 2011	Half completed	T3 - 2022	Headworks Capacity Upgrade
T4 – 2011		T4 - 2021	FSL Relocation/Upgrade
T5 – 2012		T5 - 2022	Biolac Expansion
T6 – 2010	Completed		
T7 – 2018	Not needed at this time		
R1 – 2010	Completed		
R2 – 2011	Completed		
R3 – 2015	Not needed at this time		
R4 – 2020	Not needed at this time		
R5 - 2017	Not needed at this time		
		CWC2 - 2017	Pine Street Pump Upgrade
		CWC3 - 2017	Jeans Road Pump Upgrade*
		CWT1 - 2017	Outfall Diffuser
		CWT2 - 2020	Disk Filter
* Note, if CWC1 occurs prior to CWC3, then CWC3 is not necessary.			

7.2 CIP Cost Summary

A summary of the recommended projects, their costs, and recommended design start dates is provided below. Detailed cost estimates are included in Section 6.

CAPTIAL IMPROVEMENT PLAN

		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Collection System Projects																						
CWC1	**Predesign**		$122,055																			
	Design			$244,109																		
	Install Jack Kelly Drive Lift Station and FM*				$2,685,201																	
CWC2	**Predesign**		$2,160																			
	Design			$4,320																		
	Upgrade Pine Street Lift Station Capacity				$47,520																	
CWC3	**Predesign**		$4,280																			
	Design			$8,560.00																		
	Upgrade Jeans Road Lift Station Capacity*				$94,160																	
CWC4	**Predesign**				$79,856																	
	Design					$159,712																
	Install Huston Road Lift Station and FM						$1,756,830															
***Note, If CWC1 is completed prior to CWC3, CWC3 is not necessary.**																						
Wastewater Treatment Plant Projects																						
CWT1	**Predesign**		$1,000																			
	Design			$2,000																		
	Install Outfall Diffuser				$22,000																	
CWT2	**Predesign**					$15,360																
	Design						$30,720															
	Install Disk Filter							$337,920														
T3	**Predesign**							$3,600														
	Design								$7,200													
	Upgrade Headworks									$79,200												
T4	**Predesign**						$35,600															
	Design							$71,200														
	Demo/Relocate FSLs								$783,200													
T5	**Predesign**							$100,000														
	Design								$200,000													
	Construct Biolac Basins									$2,200,000												
	Fiscal Year Totals:		**$129,495**	**$258,989**	**$2,928,737**	**$175,072**	**$1,823,150**	**$512,720**	**$990,400**	**$2,279,200**												

APPENDIX A

NPDES Permit

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

Department of Environmental Quality
Western Region – Salem Office
750 Front Street NE, Suite 120, Salem, OR 97301-1039
Telephone: (503) 378-8240

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:

City of Veneta
P.O. Box 458
Veneta, OR 97487

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated Wastewater	001	R.M. 33
Recycled Water Reuse	002	Land irrigation

FACILITY TYPE AND LOCATION:
Activated Sludge
Veneta Sewage Treatment Plant
24679 Sertic Road
Treatment System Class: Level II
Collection System Class: Level II

RECEIVING STREAM INFORMATION:
Basin: Willamette
Sub-Basin: Upper Willamette
Receiving Stream: Long Tom River
LLID: 1232400443847 – 35.5 – D
County: Lane

EPA REFERENCE NO: OR-002053-2

Issued in response to Application No. 967991 received December 29th, 2010. This permit is issued based on the land use findings in the permit record.

Ranei Nomura
Ranei Nomura, Water Quality Manager,
Western Region

12/13/2013
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorised to: 1) operate a wastewater collection, treatment, control and disposal system; and 2) discharge treated wastewater to waters of the state only from the authorised discharge point or points in Schedule A in conformance with the requirements, limits, and conditions set forth in this permit.

Unless specifically authorised by this permit, by another NPDES permit, or by Oregon statute or administrative rule, any other direct or indirect discharge of pollutants to waters of the state is prohibited.

SCEHDULE A: WASTE DISCHARGE LIMITATIONS NOT TO BE EXCEEDED

1. Outfall 001 – *Treated Effluent*

June 1st – September 30th: No discharge to waters of the State (unless approved in writing by the Department).

a. BOD_5 and TSS

November 1st – April 30th

Parameter	Average Effluent Concentrations Monthly	Weekly	Monthly Average lb/day	Weekly Average lb/day	Daily Maximum lbs
BOD_5	30 mg/L	45 mg/L	130	200	260
TSS	30 mg/L	45 mg/L	130	200	260

Winter mass load limits based upon design average wet weather flow to the facility equalling 0.524 MDG.

October 1st – October 31st and May 1st – May 31st

Parameter	Average Effluent Concentrations Monthly	Weekly	Monthly Average lb/day	Weekly Average lb/day	Daily Maximum lbs
BOD_5	10 mg/L	15 mg/L	44	66	88
TSS	10 mg/L	15 mg/L	44	66	88

Discharge only allowed when stream flow in the Long Tom River is at a minimum of 50 cubic feet per second (CFS), the treated effluent storage pond is near its capacity, and the approved land application sites are saturated which would preclude irrigation of treated wastewater. Mass load limits and concentration limits based upon the design average wet weather flow to the facility of 0.524 MGD and the Willamette Basin standard of 10 mg/L BOD and TSS. (See Note A.1).

b. Other Parameters

Parameter	Limitations
E. coli Bacteria	Must not exceed 126 organisms per 100 ml monthly geometric mean. No single sample may exceed 406 organisms per 100 ml. (See Note A.2)
pH	Must be within the range of 6.0 – 9.0
BOD_5 and TSS Removal Efficiency	Must not be less than 85% monthly average.

c. Regulatory Mixing Zone

The allowable mixing zone is that portion of the Long Tom River contained within a band extending out no more than 1/4 of the width of the stream from the east bank and extending from a point fifteen feet upstream of the outfall to a point 150 feet downstream from the outfall. The Zone of Immediate Dilution (ZID) is defined as that portion of the allowable mixing zone that is contained within a band one and one-half (1.5) feet upstream, two feet toward midstream and fifteen feet downstream of the point of discharge.

2. Outfall 002 – *Recycled Wastewater*

a. Treatment classification

No discharge to state waters is permitted. Recycled water must be treated to the appropriate level and re-used for the following beneficial purposes:

Level of Treatment	Level of Treatment (after disinfection, unless otherwise specified)	Beneficial Uses
C	Oxidised and disinfected. Total coliform may not exceed: • A median of 23 total coliform organisms per 100 mL, based on results of the last 7 days that analyses have been completed. • 240 total coliform organisms per 100 mL in any two consecutive samples.	• Class D and non-disinfected uses. • Irrigation of processed food crops; Irrigation of orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil. • Landscape irrigation of golf courses, cemeteries, highway medians, or industrial or business campuses. • Industrial, commercial, or construction uses limited to: industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, non-structural firefighting using aircraft, street sweeping, or sanitary sewer flushing.
D	Oxidised and disinfected. *E. coli* may not exceed: • A 30-day log mean of 126 organisms per 100 mL. • 406 organisms per 100 mL in any single sample.	• Non-disinfected uses. • Irrigation of firewood, ornamental nursery stock, Christmas trees, sod, or pasture for animals.

b. Recycled water requirements

(i) All recycled water use distributed on land for dissipation by evapotranspiration and controlled seepage must follow sound irrigation practises so as to prevent:

(A) Prolonged ponding of treated recycled water on the ground surface;
(B) Surface run-off or subsurface drainage through drainage tile;
(C) The creation of odours, fly and mosquito breeding or other nuisance conditions;
(D) The overloading of land with nutrients, organics, or other pollutant parameters;
(E) Impairment of existing or potential beneficial uses of groundwater.

(ii) All use of recycled water must conform to the Recycled Water Use Plan approved by the Department

3. Groundwater

No activities may be conducted that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR 340-040).

4. Chlorine Usage

No chlorine or chlorine compounds shall be used for disinfection purposes and no chlorine residual shall be allowed in the effluent due to chlorine used for maintenance purposes

Schedule A Notes:

A.1 Long Tom stream flow shall be measured daily and reported on monthly discharge monitoring reports for each day of discharge. Long Tom River flow shall be taken at the USGS stream gauge No. 14166500 on the Long Tom River near Noti, Oregon, at R.M. 37.4.

A.2 If a single sample exceeds 406 organisms per 100 ml then five consecutive re-samples may be taken at four-hour intervals beginning within 28 hours after the original sample was taken. If the log mean of the five re-samples is less than or equal to 126 organisms per 100 ml, a violation will not be triggered.

A.3 This permit may be re-opened upon approval of a Total Maximum Daily Load (TMDL) for this sub-basin to modify current limits or include new or revised limits or other conditions or requirements.

SCHEDULE B: MINIMUM MONITORING AND REPORTING REQUIREMENTS

REPORTING SUMMARY			
Item	**Frequency**	**Due date**	**Section(s)**
Discharge Monitoring Report	Monthly	By 15th of following month	1.a, 1.b, 1.c, 1.d
Inflow and Infiltration (I&I) reduction report	Yearly	February 1st of following year	4.a
Biosolids report	Yearly	February 19th of following year	1.e, 4.b
Recycled water report	Yearly	January 15th of following year	4.c

1. **Minimum Monitoring Requirements**

a. **Influent**

Influent samples are to be collected at the headworks after the rotating drum screen.

Item or Parameter	Minimum Frequency	Type of Sample
BOD_5	1 per week	Composite
TSS	1 per week	Composite
pH	2 per week	Grab

b. **Outfall 001 – *Treated Effluent***

The effluent samples are to be collected at the end of the UV disinfection channel.

The following monitoring is required when discharging through Outfall 001:

Item or Parameter	Minimum Frequency	Type of Sample
Total Effluent Flow (MGD)	Daily	Measurement
Flow Meter Calibration	Annual	Verification
BOD_5	1 per week	Composite
TSS	1 per week	Composite
Pounds Discharged (BOD_5 and TSS)	1 per week	Calculation
pH	2 per week	Grab
Temperature	2 per week	Grab
E. coli bacteria	1 per week	Grab
UV Radiation Intensity	Daily	Reading **(See Note B.1)**
Ammonia	2 per month	Grab **(See Note B.3)**
Average Percent Removed (BOD_5 and TSS)	Monthly	Calculation

c. Long Tom River

Item or Parameter	Minimum Frequency	Type of Sample
River flow (Upstream of Outfall 001)	Daily, in May and October when discharging through Outfall 001	Measurement **(See Note B.2)**

d. Outfall 002 – *Recycled Water*

The following monitoring is required when discharging through Outfall 002:

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Measurement
Quantity Irrigated (inches/acre)	Daily	Measurement
Flow Meter Calibration	Annually	Verification
pH	2 per week	Grab
Total Coliform	1 per week	Grab
UV Radiation Intensity	Daily	Reading **(See Note B.1)**
Nutrients (TKN, NO_2+NO_3-N, NH_3, Total Phosphorus	Every 90 days **(See Note B.4)**	Grab

e. Biosolids Management

Item or Parameter	Minimum Frequency	Type of Sample
Sludge Depth in Cell #1	Annually	Representative Measurement
Sludge Depth in Cell #2	Annually	Representative Measurement
Nutrient and conventional parameters (% dry weight unless otherwise specified): Total Kjeldahl Nitrogen (TKN), nitrate-nitrogen (NO_3-N), ammonium nitrogen (NH_4-N), total phosphorus (P), potassium (K), pH (S.U.), total solids, volatile solids	Once per year	Representative composite of biosolids to be land applied each year
Pollutants: As; Cd; Cu; Hg; Mo; Pb; Ni; Se; Zn; mg/kg dry weight	Once per year	Representative Composite

Item or Parameter	Minimum Frequency	Type of Sample
Pathogen reduction	As described in the DEQ-approved Biosolids Management Plan for Class B biosolids	As described in the DEQ-approved Biosolids Management Plan
Vector attraction reduction	As described in the DEQ-approved Biosolids Management Plan	As described in the DEQ-approved Biosolids Management Plan
Record of biosolids land application: date; quantity; location.	Each event	Record the date, quantity, and location of biosolids land applied on site location map or equivalent electronic system, such as GIS.
Septage received: source; quantity, gallons	Each event	Record the source and quantity of septage received.

2. Monitoring Quality Assurance/Quality Control

a. Sample Collection

The permittee must collect samples using proper sampling techniques (sample container type, preservation, and holding time) required by 40 CFR Part 136.

b. Test Methods

The permittee must ensure its laboratory uses test methods required by 40 CFR Part 136 and for all required analysis meets the quantitation limits specified in this schedule, unless otherwise approved by the Department in writing.

c. Quality Assurance and Quality Control (QA/QC)

For instructions on proper sampling techniques, test methods and the use of laboratories with QA/QC procedures, see Schedule F, Sections B.1 and C.

d. Re-analysis, Re-sampling and Reporting of Data if QA/QC Requirements Not Met

If QA/QC requirements are not met for any analysis, the permittee must have the sample re-analysed. If the sample cannot be re-analysed, the permittee must re-sample at the earliest available opportunity. Permittee must include the results of samples not meeting QA/QC in the report but must not use the data in the calculations required by the permit.

3. Reporting Requirements

a. Significant Figures

Mass load limits all have two significant figures unless otherwise noted. The permittee must report the same number of significant digits as the permit limit for a given parameter. Regardless of the rounding conventions used by the permittee (i.e., rounding 5 up for the calculated results or, in the case of laboratory results, rounding 5 to the nearest even number), the permittee must use the convention consistently, and must ensure that laboratories employed by the permittee use the same convention.

b. Quantitation Limits (QL)

The QL must be reported along with any result reported as "non-detect" or "ND". The QL is the Method Reporting Limit (MRL) or Limit of Quantitation (LOQ). It is the lowest level at which the entire analytical system can give a recognisable signal and acceptable calibration for the analyte. It is equivalent to the concentration of the lowest calibration standard assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

c. Calculating Mass Loads

The permittee must calculate mass loads as follows:

Flow (in MGD) X Concentration (in mg/L) X 8.34 = Pounds per day

d. Other Reporting Procedures

The permittee must meet the following conditions:

(i) The permittee must report the results of monitoring required under Conditions 1.a, 1.b, 1.c and 1.d on Department-approved Discharge Monitoring Report (DMR) forms. The reporting period is the calendar month. DMRs must be submitted to the appropriate Department office by the 15th day of the following month.

(ii) DMRs must identify the name, certificate classification and grade level of each principal operator designated by the permittee as responsible for supervising the wastewater collection and treatment systems during the reporting period. DMRs must also identify each system classification as found on page one of this permit.

(iii) DMRs must also include a record of the quantity and method of use of all sludge removed from the treatment facility and a record of any equipment breakdowns and bypassing.

4. Annual Reports

a. The permittee must have in place a programme to identify and reduce inflow and infiltration into the sewage collection system. An annual report must be submitted to the Department by February 1st of each year which details sewer collection maintenance activities that reduce inflow and infiltration. The report must state those activities that have been done in the previous year and those activities planned for the following year.

b. For any year in which biosolids are land applied, a report must be submitted to the Department by February 19th of the following year that describes solids handling activities for the previous year and includes, but is not limited to, the required information outlined in OAR 340-050-0035(6)(a)-(e).

c. By no later than January 15th of each year, a report must be submitted to the Department describing the effectiveness of the recycled water system. The report must demonstrate compliance with the approved recycled water use plan, Division 55 rules, and the limitations and conditions of this permit applicable to recycled water.

5. Mixing Zone Study

a. The permittee must prepare and submit an updated Mixing Zone Study. The study is due with the next permit renewal application.

Schedule B Notes:

B.1 The intensity of UV radiation passing through the water column will affect the system's ability to kill organisms. To track the reduction in intensity, the UV disinfection system must include a UV intensity meter with a sensor located in the water column at a specified distance from the UV bulbs. This meter will measure the intensity of UV radiation in mWatts-seconds/cm2. The daily UV radiation intensity must be determined by reading the meter each day. If more than one meter is used, the daily recording will be an average of all meter readings each day.

B.2 Long Tom River flow must be taken at the USGS stream gauge No. 14166500 on the Long Tom River near Noti, Oregon, at R.M. 37.4.

B.3 Ammonia monitoring is required for the first two seasons of discharge through Outfall 001. After that time, ammonia monitoring may be discontinued for Outfall 001 unless otherwise notified in writing by the Department. For any month where there is less than two weeks of discharge through Outfall 001, only one ammonia sample is required.

B.4 The first nutrient sample of the irrigation season must be taken during the first five days of discharge through Outfall 002. Each succeeding nutrient sample must be taken no more than 90 days apart.

SCHEDULE D: SPECIAL CONDITIONS

1. Wastewater System Operator Certification

The permittee must comply with Oregon Administrative Rules (OAR), Chapter 340, Division 49, *Regulations Pertaining To Certification of Wastewater System Operator Personnel* and accordingly:

a. The permittee must have its wastewater system supervised by one or more operators who are certified in a classification and grade level (equal to or greater) that corresponds with the classification (collection and /or treatment) of the system to be supervised as specified on *Page One* of this permit. The permittee may contract for part-time supervision in accordance with OAR 340-049-0015(3) and 340-049-0070.

Note: A "supervisor" is defined as the person exercising authority for establishing and executing the specific practise and procedures of operating the system in accordance with the policies of the permittee and requirements of the waste discharge permit. "Supervise" means responsible for the technical operation of a system, which may affect its performance or the quality of the effluent produced. Supervisors are not required to be on-site at all times.

b. The permittee's wastewater system may not be without supervision (as required by Condition D.1.a above) for more than thirty (30) days unless otherwise authorised by the Department of Environmental Quality in writing. During this period, and at any time that the supervisor is not available to respond on-site (i.e. vacation, sick leave or off-call), the permittee must make available another person who is certified in the proper classification and at Grade Level I or higher.

c. If the wastewater system has more than one daily shift, the permittee must have the shift supervisor, if any, certified at no less than one grade lower than the system classification.

d. The permittee is responsible for ensuring the wastewater system has a properly certified supervisor available at all times to respond on-site at the request of the permittee and to any other operator.

e. The permittee must notify the Department of Environmental Quality in writing within thirty (30) days of replacement or re-designation of certified operators responsible for supervising wastewater system operation. The notice must be filed with the Water Quality Division, Operator Certification Program, 2020 SW 4th, Suite 400, Portland, OR 97201. This requirement is in addition to the reporting requirements contained under *Schedule B* of this permit.

f. Upon written request, the Department may grant the permittee reasonable time, not to exceed 120 days, to obtain the services of a qualified person to supervise the wastewater system. The written request must include justification for the time needed, a schedule for recruiting and hiring, the date the system supervisor availability ceased and the name of the alternate system supervisor(s) as required by 5.b. above.

2. Biosolids and Sewage Sludge Management

a. All biosolids must be managed in accordance with the DEQ approved biosolids management plan, and the site authorisation letters issued by the DEQ. Any changes in solids management activities that significantly differ from operations specified under the approved plan require the prior written approval of the DEQ.

b. All new biosolids application sites shall meet the site selection criteria set forth in OAR 340-50-0070. Property owners adjacent to any newly approved application sites shall be notified, in writing or by any method approved by DEQ, of the proposed activity prior to the start of application. For proposed new application sites that are deemed by the DEQ to be sensitive with respect to residential housing, runoff potential or threat to groundwater, an opportunity for public comment will be provided in accordance with OAR 340-50-0030.

c. This permit may be modified to incorporate any applicable standard for biosolids use or disposal promulgated under section 405(d) of the Clean Water Act, if the standard for biosolids use or disposal is more stringent than any requirements for bio-solids use or disposal in the permit, or controls a pollutant or practise not limited in this permit.

3. Recycled Water Management

a. All recycled water used at the treatment plant site (or satellite facility operating under the same permit) for landscape irrigation or in-plant processes is exempt from the Division 55 rules if:

i. The recycled water is an oxidised and disinfected wastewater;

ii. The recycled water is used at the site where is it generated or at an auxiliary wastewater or sludge treatment facility that is subject to the same NPDES or WPCF permit as the wastewater treatment system. Contiguous property to the parcel of land upon which the treatment system is located is considered the wastewater treatment system site if under the same ownership;

iii. Spray or drift or both from the use does not occur off the site;

iv. Public access to the site is restricted.

4. Breakdown Notification

The permittee must notify a DEQ-Western Region Office in accordance with the response times noted in the General Conditions of this permit, of any malfunction so that corrective action can be coordinated between the permittee and the Department.

SCHEDULE F: NPDES GENERAL CONDITIONS – DOMESTIC FACILITIES

SECTION A. STANDARD CONDITIONS

A1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and the federal Clean Water Act and is grounds for an enforcement action. Failure to comply is also grounds for DEQ to terminate, modify and reissue, revoke, or deny renewal of a permit.

A2. Penalties for Water Pollution and Permit Condition Violations

The permit is enforceable by DEQ or EPA, and in some circumstances also by third-parties under the citizen suit provisions 33 USC § 1365. DEQ enforcement is generally based on provisions of state statutes and Environmental Quality Commission (EQC) rules, and EPA enforcement is generally based on provisions of federal statutes and EPA regulations.

ORS 468.140 allows DEQ to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit. The federal Clean Water Act provides for civil penalties not to exceed $32,500 and administrative penalties not to exceed $11,000 per day for each violation of any condition or limitation of this permit.

Under ORS 468.943, unlawful water pollution, if committed by a person with criminal negligence, is punishable by a fine of up to $25,000, imprisonment for not more than one year, or both. Each day on which a violation occurs or continues is a separately punishable offense. The federal Clean Water Act provides for criminal penalties of not more than $50,000 per day of violation, or imprisonment of not more than 2 years, or both for second or subsequent negligent violations of this permit.

Under ORS 468.946, a person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a Class B felony punishable by a fine not to exceed $250,000 and up to 10 years in prison per ORS chapter 161. The federal Clean Water Act provides for criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment of not more than 3 years, or both for knowing violations of the permit. In the case of a second or subsequent conviction for knowing violation, a person is subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

A3. Duty to Mitigate

The permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of DEQ, the permittee must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

A4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application must be submitted at least 180 days before the expiration date of this permit.

DEQ may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

A5. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute.
b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts.
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
d. The permittee is identified as a Designated Management Agency or allocated a wasteload under a total maximum daily load (TMDL).
e. New information or regulations.
f. Modification of compliance schedules.
g. Requirements of permit reopener conditions
h. Correction of technical mistakes made in determining permit conditions.
i. Determination that the permitted activity endangers human health or the environment.
j. Other causes as specified in 40 CFR §§ 122.62, 122.64, and 124.5.
k. For communities with combined sewer overflows (CSOs):
   (1) To comply with any state or federal law regulation for CSOs that is adopted or promulgated subsequent to the effective date of this permit.
   (2) If new information that was not available at the time of permit issuance indicates that CSO controls imposed under this permit have failed to ensure attainment of water quality standards, including protection of designated uses.
   (3) Resulting from implementation of the permittee's long-term control plan and/or permit conditions related to CSOs.

The filing of a request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

A6. Toxic Pollutants
The permittee must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rule (OAR) 340-041-0033 and section 307(a) of the federal Clean Water Act for toxic pollutants, and with standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

A7. Property Rights and Other Legal Requirements
The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other private rights, or any infringement of federal, tribal, state, or local laws or regulations.

A8. Permit References
Except for effluent standards or prohibitions established under section 307(a) of the federal Clean Water Act and OAR 340-041-0033 for toxic pollutants, and standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

A9. Permit Fees
The permittee must pay the fees required by OAR.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

B1. Proper Operation and Maintenance
The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary

facilities or similar systems that are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

B2. Need to Halt or Reduce Activity Not a Defense
For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B3. Bypass of Treatment Facilities
- a. Definitions
  - (1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs b and c of this section.
  - (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- b. Prohibition of bypass.
  - (1) Bypass is prohibited and DEQ may take enforcement action against a permittee for bypass unless:
    - i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
    - ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventative maintenance; and
    - iii. The permittee submitted notices and requests as required under General Condition B3.c.
  - (2) DEQ may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, if DEQ determines that it will meet the three conditions listed above in General Condition B3.b.(1).
- c. Notice and request for bypass.
  - (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, a written notice must be submitted to DEQ at least ten days before the date of the bypass.
  - (2) Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required in General Condition D5.

B4. Upset
- a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.
- b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of General Condition B4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
  - (1) An upset occurred and that the permittee can identify the causes(s) of the upset;

(2) The permitted facility was at the time being properly operated;
(3) The permittee submitted notice of the upset as required in General Condition D5, hereof (24-hour notice); and
(4) The permittee complied with any remedial measures required under General Condition A3 hereof.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

B5. Treatment of Single Operational Upset

For purposes of this permit, a single operational upset that leads to simultaneous violations of more than one pollutant parameter will be treated as a single violation. A single operational upset is an exceptional incident that causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one federal Clean Water Act effluent discharge pollutant parameter. A single operational upset does not include federal Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational upset is a violation.

B6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definition. "Overflow" means any spill, release or diversion of sewage including:
   (1) An overflow that results in a discharge to waters of the United States; and
   (2) An overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral), even if that overflow does not reach waters of the United States.
b. Reporting required. All overflows must be reported orally to DEQ within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D5.

B7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (for example, public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed under General Condition B8. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

B8. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from overflows, bypasses, or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

a. Ensure that the permittee is aware (to the greatest extent possible) of such events;
b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;
c. Ensure immediate notification to the public, health agencies, and other affected public entities (including public water systems). The overflow response plan must identify the public health and other officials who will receive immediate notification;
d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;
e. Provide emergency operations; and
f. Ensure that DEQ is notified of the public notification steps taken.

B9. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering waters of the state, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

C1. Representative Sampling
Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit, and must be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points must not be changed without notification to and the approval of DEQ.

C2. Flow Measurements
Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

C3. Monitoring Procedures
Monitoring must be conducted according to test procedures approved under 40 CFR part 136 or, in the case of sludge use and disposal, approved under 40 CFR part 503 unless other test procedures have been specified in this permit.

C4. Penalties of Tampering
The federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit may, upon conviction, be punished by a fine of not more than $10,000 per violation, imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both.

C5. Reporting of Monitoring Results
Monitoring results must be summarized each month on a discharge monitoring report form approved by DEQ. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

C6. Additional Monitoring by the Permittee
If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR part 136 or, in the case of sludge use and disposal, approved under 40 CFR part 503, or as specified in this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the discharge monitoring report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (for example, total residual chlorine), only the average daily value must be recorded unless otherwise specified in this permit.

C7. Averaging of Measurements
Calculations for all limitations that require averaging of measurements must utilize an arithmetic mean, except for bacteria which must be averaged as specified in this permit.

C8. Retention of Records
Records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities must be retained for a period of at least 5 years (or longer as required by 40 CFR part 503). Records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit must be retained for a period of at least 3 years from

the date of the sample, measurement, report, or application. This period may be extended by request of DEQ at any time.

C9. Records Contents

Records of monitoring information must include:

a. The date, exact place, time, and methods of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

C10. Inspection and Entry

The permittee must allow DEQ or EPA upon the presentation of credentials to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

C11. Confidentiality of Information

Any information relating to this permit that is submitted to or obtained by DEQ is available to the public unless classified as confidential by the Director of DEQ under ORS 468.095. The permittee may request that information be classified as confidential if it is a trade secret as defined by that statute. The name and address of the permittee, permit applications, permits, effluent data, and information required by NPDES application forms under 40 CFR § 122.21 are not classified as confidential [40 CFR § 122.7(b)].

SECTION D. REPORTING REQUIREMENTS

D1. Planned Changes

The permittee must comply with OAR 340-052, "Review of Plans and Specifications" and 40 CFR § 122.41(l)(1). Except where exempted under OAR 340-052, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers may be commenced until the plans and specifications are submitted to and approved by DEQ. The permittee must give notice to DEQ as soon as possible of any planned physical alternations or additions to the permitted facility.

D2. Anticipated Noncompliance

The permittee must give advance notice to DEQ of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

D3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and EQC rules. No permit may be transferred to a third party without prior written approval from DEQ. DEQ may require modification, revocation, and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under 40 CFR § 122.61. The permittee must notify DEQ when a transfer of property interest takes place.

D4. <u>Compliance Schedule</u>
Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

D5. <u>Twenty-Four Hour Reporting</u>
The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) to the DEQ regional office or Oregon Emergency Response System (1-800-452-0311) as specified below within 24 hours from the time the permittee becomes aware of the circumstances.

a. Overflows.
   (1) Oral Reporting within 24 hours.
      i. For overflows other than basement backups, the following information must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311. For basement backups, this information should be reported directly to the DEQ regional office.
         (a) The location of the overflow;
         (b) The receiving water (if there is one);
         (c) An estimate of the volume of the overflow;
         (d) A description of the sewer system component from which the release occurred (for example, manhole, constructed overflow pipe, crack in pipe); and
         (e) The estimated date and time when the overflow began and stopped or will be stopped.
      ii. The following information must be reported to the DEQ regional office within 24 hours, or during normal business hours, whichever is earlier:
         (a) The OERS incident number (if applicable); and
         (b) A brief description of the event.
   (2) Written reporting within 5 days.
      i. The following information must be provided in writing to the DEQ regional office within 5 days of the time the permittee becomes aware of the overflow:
         (a) The OERS incident number (if applicable);
         (b) The cause or suspected cause of the overflow;
         (c) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
         (d) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps; and
         (e) For storm-related overflows, the rainfall intensity (inches/hour) and duration of the storm associated with the overflow.

      DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

b. Other instances of noncompliance.
   (1) The following instances of noncompliance must be reported:
      i. Any unanticipated bypass that exceeds any effluent limitation in this permit;
      ii. Any upset that exceeds any effluent limitation in this permit;
      iii. Violation of maximum daily discharge limitation for any of the pollutants listed by DEQ in this permit; and
      iv. Any noncompliance that may endanger human health or the environment.
   (2) During normal business hours, the DEQ regional office must be called. Outside of normal business hours, DEQ must be contacted at 1-800-452-0311 (Oregon Emergency Response System).
   (3) A written submission must be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:
      i. A description of the noncompliance and its cause;
      ii. The period of noncompliance, including exact dates and times;
      iii. The estimated time noncompliance is expected to continue if it has not been corrected;

iv. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
v. Public notification steps taken, pursuant to General Condition B7.

(4) DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

D6. <u>Other Noncompliance</u>
The permittee must report all instances of noncompliance not reported under General Condition D4 or D5 at the time monitoring reports are submitted. The reports must contain:

a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected; and
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

D7. <u>Duty to Provide Information</u>
The permittee must furnish to DEQ within a reasonable time any information that DEQ may request to determine compliance with the permit or to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit. The permittee must also furnish to DEQ, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it has failed to submit any relevant facts or has submitted incorrect information in a permit application or any report to DEQ, it must promptly submit such facts or information.

D8. <u>Signatory Requirements</u>
All applications, reports or information submitted to DEQ must be signed and certified in accordance with 40 CFR § 122.22.

D9. <u>Falsification of Information</u>
Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $125,000 per violation and up to 5 years in prison per ORS chapter 161. Additionally, according to 40 CFR § 122.41(k)(2), *any person who knowingly makes any false statement, representation, or certification in* any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or non-compliance will, upon conviction, be punished by a federal civil penalty not to exceed $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

D10. <u>Changes to Indirect Dischargers</u>
The permittee must provide adequate notice to DEQ of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the federal Clean Water Act if it were directly discharging those pollutants and;
b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
c. *For the purposes of this paragraph, adequate notice must include information on (i) the quality and* quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

E1. *BOD* or *BOD_5* means five-day biochemical oxygen demand.
E2. *CBOD* or *$CBOD_5$* means five-day carbonaceous biochemical oxygen demand.

E3. *TSS* means total suspended solids.
E4. *Bacteria* means but is not limited to fecal coliform bacteria, total coliform bacteria, *Escherichia coli* (*E. coli*) bacteria, and *Enterococcus* bacteria.
E5. *FC* means fecal coliform bacteria.
E6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine
E7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR § 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-041.
E8. *mg/l* means milligrams per liter.
E9. *μg/l* means microgram per liter.
E10. *kg* means kilograms.
E11. m^3/d means cubic meters per day.
E12. *MGD* means million gallons per day.
E13. *Average monthly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
E14. *Average weekly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.
E15. *Daily discharge* as defined at 40 CFR § 122.2 means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge must be calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge must be calculated as the average measurement of the pollutant over the day.
E16. *24-hour composite sample* means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow. The sample must be collected and stored in accordance with 40 CFR part 136.
E17. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.
E18. *Quarter* means January through March, April through June, July through September, or October through December.
E19. *Month* means calendar month.
E20. *Week* means a calendar week of Sunday through Saturday.
E21. *POTW* means a publicly-owned treatment works.