



CITY OF BUCKLEY

Sewer Comprehensive Plan



G&O No. 13228

November 2019



Gray & Osborne, Inc.

CITY OF BUCKLEY

PIERCE COUNTY

WASHINGTON



SEWER COMPREHENSIVE PLAN



G&O #13228
NOVEMBER 2019



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- Appendix B – Infiltration/Inflow Reports, Summary of Daily Monitoring Reports,
May 2009 through April 2019
- Appendix C – Sewer Modeling Results
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- Appendix E – Sewer Use Regulations
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CHAPTER 1

INTRODUCTION

PURPOSE

The City of Buckley retained the services of Gray & Osborne, Inc., to complete an update of the General Sewer Plan for the City of Buckley. This update was necessary to make the Plan consistent with the most recent planning projections and to present an evaluation of regional alternatives for wastewater treatment and disposal. The Plan addresses the City's comprehensive planning needs for wastewater collection, transmission, treatment, and disposal through 2035. The Plan has been prepared in accordance with the provisions of the following regulations:

- Revised Code of Washington (RCW), Section 90.48, Water Pollution Control
- Washington Administrative Code (WAC), Section 173-240-050, General Sewer Plan.

Development of the Plan has been coordinated with the City's development regulations and Comprehensive Plan (as updated in 2015), the Washington State Growth Management Act, Pierce County planning efforts, and the City of Buckley Water System Plan. This Plan updates the previous Comprehensive Sewer Plan completed in 2003 by CHS Engineers, Inc. and is consistent with updates to the Comprehensive Plan that was completed in 2015.

This Plan has the following major objectives:

- Ensure that the City remains in compliance with applicable regulations governing the discharge of treated wastewater into the environment.
- Define the City's future growth needs and identify wastewater system improvements necessary to support this growth.
- Evaluate alternatives for long-term disposal and treatment of wastewater generated by the City.
- Clearly identify a plan for treatment and disposal of the City's wastewater for the next 20 years.
- Evaluate flow-based sewer rate alternatives

The Plan is intended to be feasible in terms of engineering, economic, regulatory, and political frameworks. The Plan includes conceptual designs and cost estimates for recommended system improvements, as well as a proposed schedule and financing plan for the capital improvement plan.

The City's existing NPDES permit, the permit fact sheet, and regulatory correspondence relating to this Plan is provided in Appendix A.

EXISTING SYSTEM

OVERVIEW OF EXISTING CONDITIONS

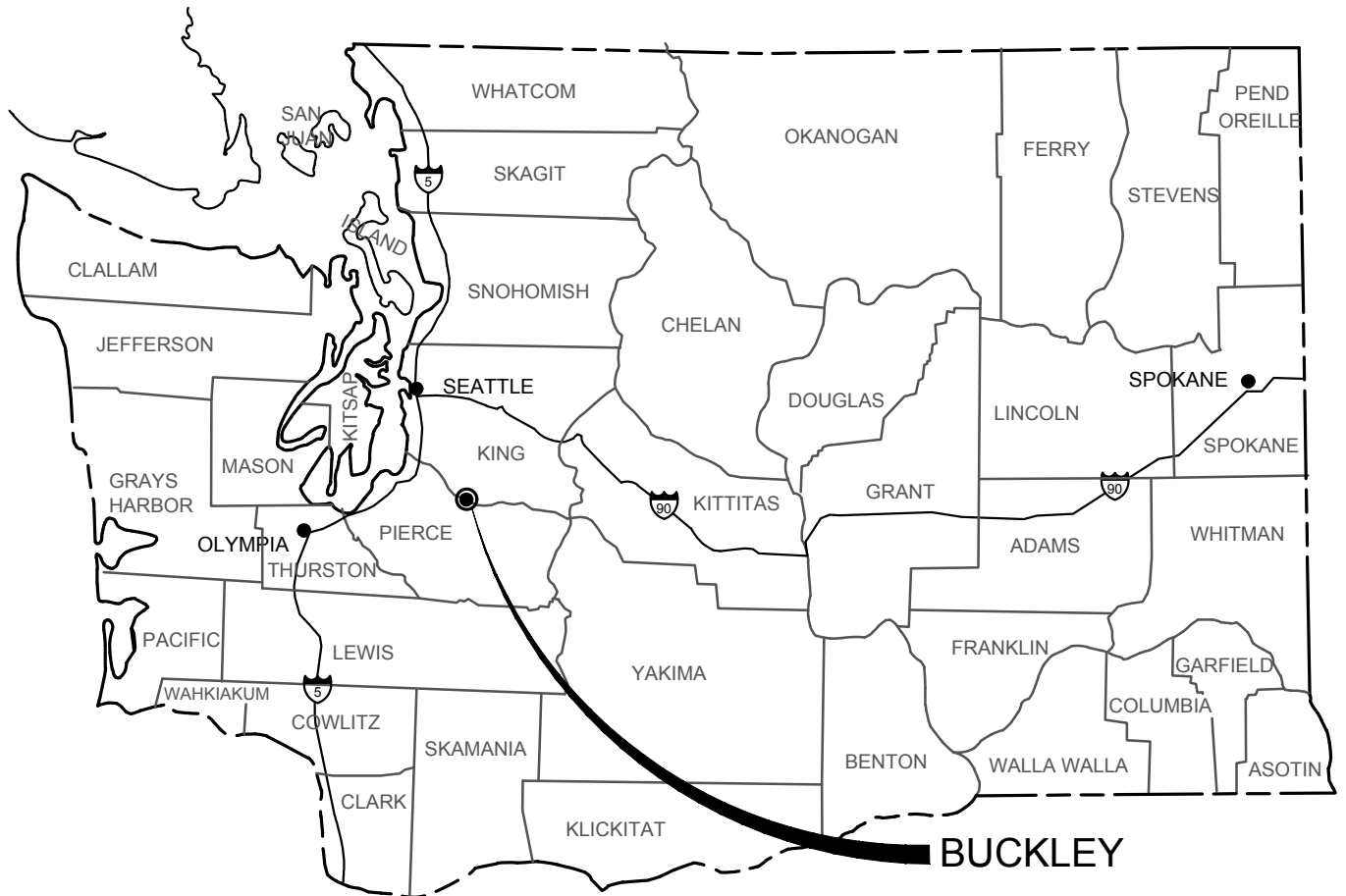
The City of Buckley is located in Pierce County, Washington. Pierce County is bordered to the east by the Cascade Mountains and to the west by Puget Sound. The White River defines the northern edge of Pierce County and the City of Buckley City limits and sewer service area. A map showing the location of Buckley is presented as Figure 1-1. The area to the east of Buckley is primarily commercial, State and Federal forest land. To the west are the Cities of Bonney Lake, Sumner, Puyallup, and Tacoma. To the south are the small Towns of Wilkeson and Carbonado.

The City lies on a relatively flat plateau between Puget Sound and the Cascade Mountains, with drainage generally sloping from south and east to the north and west. The City is at an elevation range of 600 to 1040 feet.

The White River, located on the northern border of City limits, is a major tributary to the Puyallup River. The Puget Power flume diverts water from the White River and releases water into Lake Tapps, west of the City. Streams located just outside City limits include South Prairie Creek and its tributaries, Page Creek, Gail Creek, and Spiketon Creek. Spiketon Creek flows within City limits for a short distance in the northeastern corner of the City.

The current City limits constitute an area of approximately 2,530 acres. The area served by the wastewater collection system only includes approximately 1,020 acres, or about 40 percent of the area within the City's corporate limits. The majority of the City's 2013 estimated population of 4,370 is connected to sewer service with the exception of a few homes in the more rural eastern area of the City.

Figure 1-2 shows the City limits that are designated for Buckley. The City of Buckley has submitted several Urban Growth Boundaries requests to Pierce County for approval, but each submission has been denied. The City of Buckley does not currently have an Urban Growth Boundary approved by Pierce County. The environment in and around the City, as well as the growth anticipated for the City, is discussed in more detail in Chapters 2 and 3 of this Plan.



VICINITY MAP
NOT TO SCALE

**CITY OF BUCKLEY
SEWER COMPREHENSIVE PLAN**

FIGURE 1-1

VICINITY MAP



The City is governed by a City Council form of government. The Public Works Department manages the sewer, water, road, and storm sewer systems. The City's contact information is listed as follows:

Chris Banks
Utilities Superintendent
City of Buckley
P.O. Box 1960
240 River Road
Buckley, Washington 98321

E-mail address:
cbanks@cityofbuckley.com

Phone: (360) 829-1921, ext. 7884

Existing Reports and Documents

The existing documents and reports that were reviewed in the preparation of this Plan include:

- *City of Buckley Comprehensive Plan*, City of Buckley Planning Department, December 2015.
- *City of Buckley Comprehensive Sewer Plan*, CHS Engineers, Inc., August 2003.
- *City of Buckley Water System Comprehensive Plan*, August 2017.

In addition, planning data such as urban growth maps, zoning maps, billing records, wastewater treatment plant (WWTP) discharge monitoring reports, and pertinent correspondence from the City of Buckley and Pierce County were reviewed and incorporated in this Plan.

Existing System

The City owns and operates a municipal sewer within City limits. The sewer system serves residents, institutions and businesses within City limits. The existing system consists of a gravity collection system, a network of newer gravity lines, force mains, pump stations, a wastewater treatment plant and outfall to the White River.

The original treatment plant was built in 1952 for a design flow of 300,000 gallons per day. The facility contained a grit-removal chamber, a mechanical shredder, an Imhoff tank, chlorination facilities, four sludge drying beds, and an 18-inch cast iron effluent line. The treatment plant received an upgrade in 1980 to achieve secondary treatment and to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) waste discharge permit. This permit became effective on November 1, 1981, and expired in 1985. Ecology issued the most recent NPDES permit for the Buckley wastewater treatment plant discharge in 2003. That permit expired in 2008. However, Ecology administratively extended that permit and requires the City to monitor the influent and effluent and comply with the limitations specified in the expired permit.

Ecology is currently writing a new fact sheet and NPDES permit based on current treatment plant and receiving water conditions.

The most recent upgrade of the plant was completed in 2008, which increased the treatment capacity and also included technology for nitrogen and phosphorous removal. In addition to the treatment plant upgrade, flow in the reach of the White River receiving water increased in 2004, because Puget Sound Energy stopped diverting the majority of the river flow to Lake Tapps.

The condition and capabilities of the City's collection and treatment system are discussed in greater detail in Chapters 5 and 7 of this Plan.

CRITICAL ISSUES AND PROBLEM AREAS

A number of critical issues and potential problem areas were identified in the development of this Plan. These issues and problem areas are summarized below.

TREATMENT AND DISPOSAL

Projected wastewater flows will not exceed the capacity of the City's existing wastewater treatment plant in the near future. The City's WWTP is gated and located in the northwest corner of Buckley. The current WWTP NPDES permit maximum month design flow criterion is 1.00 MGD. An updated permit is expected to be issued by Ecology.

The WWTP discharges into White River, a tributary of Puyallup River. White River is not currently water quality listed by EPA on the 303 (d) list. Due to pH concerns, the Department of Ecology (DOE) may require the City to conduct receiving water quality and mixing zone studies in White River during the NPDES permit cycle. Based on the results of such studies, specific limits may be added to the City's NPDES permit.

White River and downstream receiving waters have been the subject of analysis and studies with respect to establishment of total maximum daily load (TMDL) and waste load allocation (WLA) for control of pH, ammonia and phosphorous levels in the river system. The maximum capacity of White River to receive WWTP effluent without violations of water quality standards affects the rated capacity of the treatment plant. Expansion of the existing WWTP beyond a capacity of approximately 2.14 MGD would not require acquisition of additional property. The existing site could support expansions in the southeast corner of the property for WWTP expansion.

COLLECTION SYSTEM

The sewer collection system was originally built in the early 1930's as a combined storm and sanitary sewer system. Over the years, extensions and sewer separations have occurred to create two completely separate collection systems. The older gravity sewer

mains consist of clay pipes with mortared bell-spigot type joints. More recent construction is primarily 8- and 10-inch concrete and PVC pipe with rubber joints; however less than 1/3 of the system has been installed with this type of construction.

In previous plans, the existing gravity collection system was identified as being in good condition. However, development primarily to the southeast of downtown raised capacity concerns regarding the ability to transmit flow through the existing collection system to the WWTP. As growth continues through the City and its urban growth area, additional sewers will need to be extended and either additional lift stations and force mains brought on-line or expansion of existing sewers.

SYSTEM GROWTH AND FINANCIAL ISSUES

The substantial portion of planned growth in the City over the next 5 years is anticipated to be related to the following subdivisions:

TABLE 1-1

Anticipated System Growth

Subdivision	No. of Sewered Lots
Elk Heights	44
Perkins Prairie Phase 1	58
Perkins Prairie Other Phases	110
Nanevich Plat	65
Evans Spiketon Road Plat	66
Total	343

At the end of 2018, the City had an outstanding debt of approximately \$4,200,000 from the wastewater treatment plant upgrades. Buckley will need to use a combination of General Facilities Charges (GFC), customer rates, and developer-constructed improvements to construct the improvements identified in this Plan which are necessary to accommodate projected growth in the Buckley area.

CHAPTER 2

SEWER SERVICE AREA

SEWER SERVICE AREA LOCATION

The sewer service area is located entirely within the current City limits in Pierce County, Washington, as shown on Figure 2-1. Background information on the service area is presented below.

PIERCE COUNTY

Pierce County was established in 1852 and is situated centrally in Washington. The County consists of 1,806 square miles and is ranked 23 out of 39 counties for land area. The County boundaries are located about 25 miles south of Seattle and 15 miles northeast of Olympia. The County is bordered on the north by both King County and Kitsap County, on the east by Yakima County, on the south by both Thurston County and Lewis County, and on the west by Mason County (as shown in Figure 1-1). With an estimated year 2012 population of 812,000, Pierce County is ranked 2nd most populous out of the 39 Washington counties. The Washington State Office of Financial Management estimates the County's population will increase to between 844,184 to 1,121,639 by the Year 2034. The largest City in the County is Tacoma, which also serves as County seat. The County also includes the Cities of Auburn (partial), Buckley, DuPont, Fife, Gig Harbor, Lakewood, Puyallup, Steilacoom, and Sumner.

Pierce County is located at the southern side of the Puget Sound. The Puget Sound divides the western side of Pierce County and provides separation between several Cities and the majority of the County. From an urban hub on the Puget Sound, the County spreads through a rapidly growing suburban bank, across agricultural lands and a networks of towns, to the slopes of the Cascade Mountain Range. Pierce County is vast, measuring approximately 45 miles north to south and 65 miles east to west. The Puget Sound and Mount Rainier volcano exert a strong influence on the climate, economy, and recreational activities of the County. Mount Rainier volcano serves as the highest point in both Pierce County and Washington.

Pierce County lies within a geographic basin known as the Puget Trough, formed by the Cascade and Pacific Coast Mountain Ranges. It is bounded on the west by the Puget Sound, on the south by the Nisqually River, on the north by the White River and on the east by the foothills of the Cascades. Along the Puget Sound are low-lying bottomlands, from which a series of alluvial plains and terraces extend. Land elevations rise from zero feet on the west floodplains to over 14,400 feet above mean sea level at Mount Rainier volcano in the eastern portion. While progressing eastward, the terrain develops into rolling hills, culminating in the Cascade Range.

CITY OF BUCKLEY

The City of Buckley is located centrally in Washington, approximately 35 miles southeast of Seattle and 20 miles east of Tacoma. Rolling hills and ravines surround the City. White River borders Buckley to the north and the existing City limits extend east and west of SR 410. The City lies on a relatively flat plateau, with drainage generally slopping from south and east to the north and west. The City is at an elevation range of 700 to 950 feet.

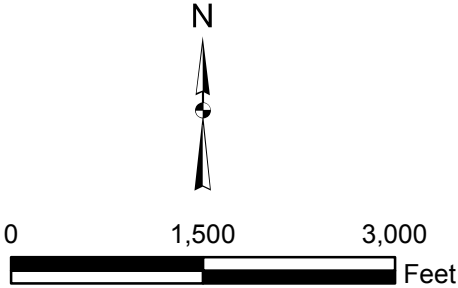
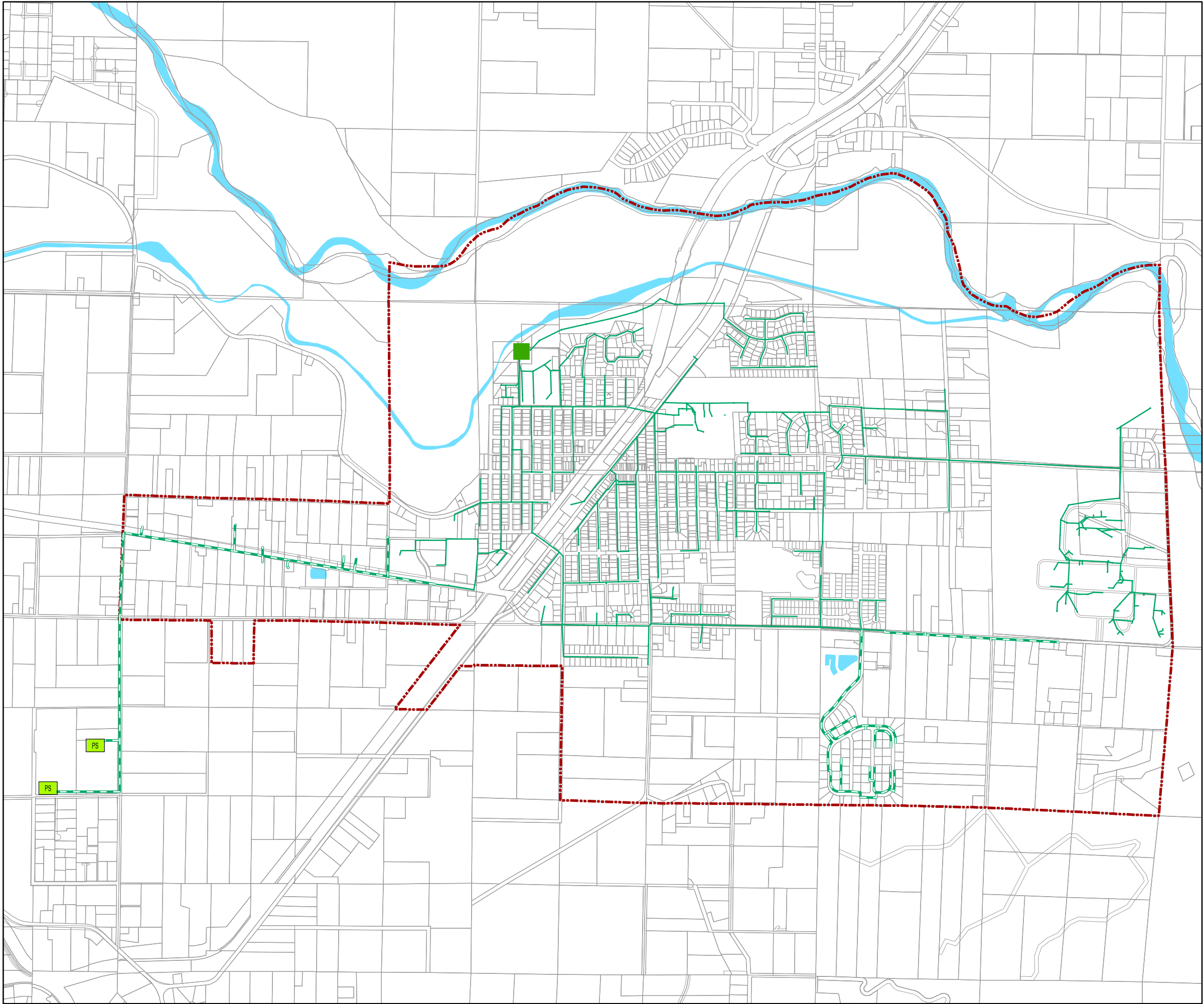
NATURAL FEATURES OF THE SEWER SERVICE AREA

Various natural features of the study area are discussed below, including climate and precipitation, geology, soils, topography, and site sensitive areas, such as floodplains, wetlands, surface and groundwater resources, and fish and wildlife habitat. The public utilities available in the area are also discussed.

CLIMATE AND PRECIPITATION

The climate of the City of Buckley is typical of that of the Pacific Northwest region between the Cascade Mountains and the Pacific Ocean. Winters are wet and mild and summers are relatively warm and dry. The mean annual temperatures range from 48.58 to 60.5 degrees Fahrenheit (F), with a minimum day temperature of -3 degrees F and a maximum day temperature of 103 degrees F. From June to September, temperatures typically range from 52.2 to 73.7 degrees F. Winter temperatures typically range from 37.0 to 48.2 degrees F.

Based on data from the NOAA weather station, the City receives an average of 43.49 inches of rain per year. November is historically the wettest month, and August the driest. Table 2-1 shows precipitation data that was measured at the NOAA weather station for the years 1981 through 2012.



Legend

- EXISTING PRESSURE SEWER LINES
- EXISTING GRAVITY SEWER LINES
- EXISTING SEWER TREATMENT PLANT
- PS EXISTING PUMP STATION
- EXISTING BUCKLEY CITY LIMITS & UGA

SOURCE: PIERCE COUNTY GIS

CITY OF BUCKLEY
SEWER COMPREHENSIVE PLAN

FIGURE 2-1
EXISTING SEWER SYSTEM



TABLE 2-1**Monthly Average Precipitation in the Buckley Area, 1981 through 2012**

Month	Average Monthly Precipitation (inches)
January	5.95
February	4.15
March	4.51
April	3.52
May	2.86
June	2.36
July	1.03
August	0.95
September	1.63
October	3.83
November	7.02
December	5.68
Average Annual Total	43.49

SOILS AND GEOLOGY**Geologic Areas**

The underlying geology of Pierce County is predominantly sedimentary and igneous rock approximately 10,000 feet deep dating from the Miocene-Pliocene period. The existing study area is primarily level yet features several steep slopes to the south and in the northernmost portion along the banks of the White River. These steep slopes are regulated through the Pierce County Geologically Hazardous Areas Ordinance and the Buckley Environmentally Sensitive Areas (ESA) Ordinance.

As part of the Southern Washington Cascades Geologic Province, the soils in the sewer service area are dominated by andesite and basalt flows and by the Osceola mudflow from an eruption of Mount Rainier.

There are a total of twelve soil series identified within the City of Buckley's City limits, yet a total of only three soil series within the City of Buckley's sewer service area. These soils are identified on Figure 2-2. The three primary soil series within the City of Buckley's sewer service area include Buckley loam, Greenwater loam and Kapowsin gravelly loam, and are further describe below.

Buckley Soil Series

Buckley loam is the predominate soil series located throughout the City. Buckley loam is a hydric soil, which is often classified as wetland soil.

From 0 to 10 inches the soil is very dark brown with a weak fine granular structure. From 10 to 18 inches the soil is very dark grayish brown with a weak medium granular structure. From 18 to 40 inches the soil is grayish brown gravelly sandy clay loam with many medium and coarse prominent brown concentrations. From 40 to 60 inches the soil is grayish brown dense Lahar that breaks to gravelly sandy clay loam with few medium and coarse prominent brown concentrations.

The Buckley loam is classified as a nearly level, poorly drained soil which results in very slow surface runoff. The Osceola mudflow deposited the material, which consists of unsorted and unstratified mixture of subrounded to subangular rock fragments in a clayey sand matrix. The primary limitation for development on this soil is the high water table in the winter and spring. Septic tank drainfields generally do not function properly during the rainy season.

The soil is used for woodland and cropland. Hay, pasture, and small grain are common crops. Native vegetation is western redcedar, western hemlock, Sitka spruce, Douglas-fir, red alder, and bigleaf maple, with an understory of vine maples, western swordfern, red huckleberry, Oregon oxalis, bedstraw, trailing blackberry, and wild ginger.

Greenwater Soil Series

Greenwater loam sand is found within the vicinity of the White River with slopes less than 10 percent.

From 0 to 9 inches the soil is very dark brown loamy sand with a weak very fine granular structure. From 9 to 19 inches the color is dark yellowish brown loamy sand and dry. From 19 to 26 inches the soil is very dark grayish brown loamy sand with compact coarse stratified layers. From 26 to 60 inches the soil is very dark gray, single grain dry sand.

The soil is used for woodland, pasture, and homesites. Native vegetation is mainly Douglas-fir, western hemlock, red alder, western redcedar and bigleaf maple with an understudy of salal, western swordfern, creambush oceanspray, trailing blackberry, rose, western brackenfern, red huckleberry, and Oregon-grape.

Kapowsin Soil Series

Kapowsin gravelly loam is found in the hilly portion of the south with slopes ranging from 0 to 50 percent.

From 0 to 7 inches the soil is dark brown with a weak very fine granular structure. From 7 to 11 inches the color is dark brown with light brownish gray and a weak fine subangular blocky structure. From 11 to 16 inches the color is dark yellowish brown with moderate medium subangular blocky structure. From 16 to 25 inches the soil is very pale brown with a moderate medium subangular blocky structure. From 25 to 29 inches the soil is olive brown and weakly cemented. From 29 to 59 inches the soil is grayish brown and strongly compacted in places.

The Kapowsin gravelly loam produces slow surface runoff and the erosion hazard ranges from slight to severe depending upon the slopes. The flatter portions of the Kapowsin soil (slopes less than 40 percent, or 15 percent or less if the soil contains spring or ground water) are suitable for development. Public sewer systems are generally required because septic tank drainage fields fail or do not function properly during the rainy season. Storm sewers are also required because concentrated runoff from roof tops and roads is greater than the soil's capacity to take water. The steeper slopes of this soil are very poorly suited for use as home sites.

The soil is used for woodland, cropland, urban development and wildlife habitat. Hay, pasture, and small grain are common crops. Native vegetation is Douglas-fir, western hemlock, western redcedar, red alder, and bigleaf maple, with an understudy of trailing blackberry, salal, creambrush oceanspray, western brackenfern western swordfern, vine maple, Oregon-grape, red huckleberry, and evergreen blackberry.

Other soils are less widely distributed in the Buckley Urban Growth Area. Additional information on each soil's suitability for agricultural, residential, sanitary facility, recreational, woodland wildlife habitat, and other land uses can be found in the Pierce County Soil Survey.

TOPOGRAPHY

The City of Buckley is located on a relatively flat plateau that gradually descends from the south and east to the north and west. The City is at an elevation range of 700 to 950 feet. The City's WWTP is located in the northwest corner within City limits and at the edge of White River. The outfall discharges in White River at a location north of the treatment plant. Figure 2-3 provides a topographic overlay of the City.

SITE SENSITIVE AREAS

Site sensitive areas within the sewer service area include those classified as seismic hazard areas, flood hazard areas, wetlands, and surface waters.

Seismic Hazard Areas

Seismic hazard areas are those with low density soils (unconsolidated sediments) that are more likely to experience greater damage due to seismic-induced subsidence, liquefaction, or landslides. Seismic hazard areas are regulated mainly with respect to public safety and with the exception of potential damage due to an earthquake; these hazard areas do not impact wastewater facilities or natural resources. After an earthquake, there could be considerable damage to sewers and lift stations in some areas that might experience very severe earth movement. Earthquake areas of concern are identified in Figure 2-4.

Landslides are a particular concern in unstable areas such as those identified in Figure 2-5. These locations are along the steep slopes to the south and on either side of the White River.

Flood Hazard Areas

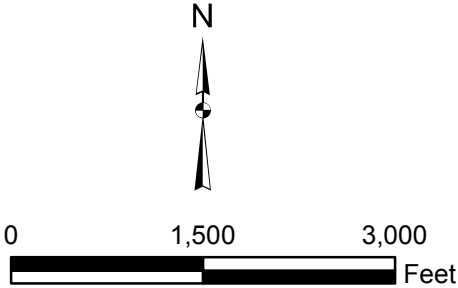
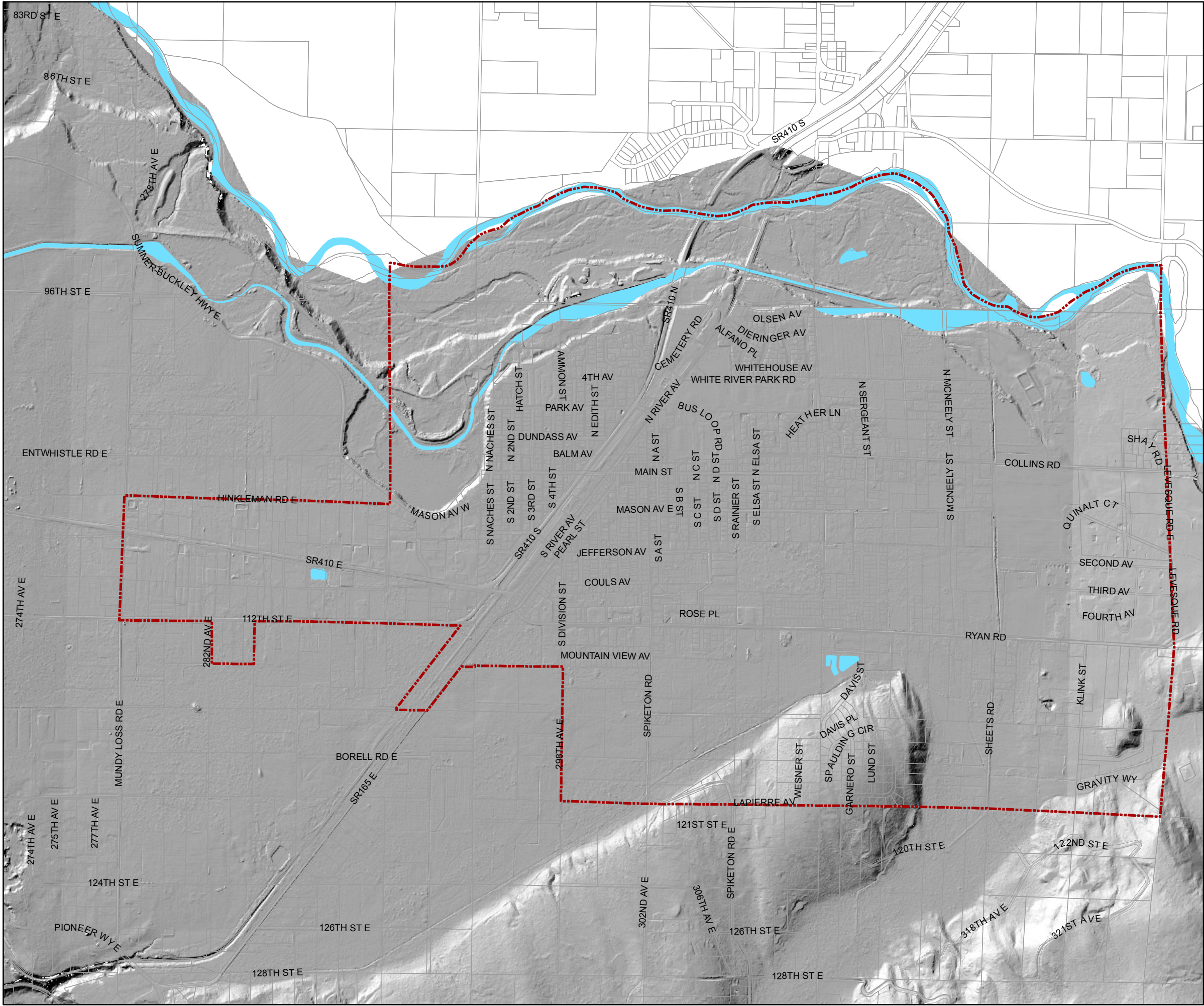
Flood hazard areas are areas adjacent to lakes, rivers, and streams that are prone to flooding during peak runoff periods. Flood hazard areas deserve special attention due to the sensitive nature of their ecosystems as well as the potential for damage to structures located within the floodplain.

Construction of buildings and other development in flood hazard areas is regulated in accordance with the County's flood hazard construction standards. Typically, construction in flood hazard areas is not allowed or is limited to specific activities. Allowed activities might be mining or gravel extraction, recreational uses, repair to existing structures, utility and road construction or uses dependent upon water such as docks, wharves, and boating activities.

The 100-year and 500-year floodplains in the vicinity of Buckley are shown on Figure 2-6. The floodplains are associated with White River. The City's wastewater treatment plant is located adjacent to White River but is situated above the 100-year flood plain.

Wetlands

Wetlands are defined by EPA as areas that are inundated with water for at least part of the year. The U.S. Fish and Wildlife Service define wetlands as those areas that have characteristics such as hydrophyte plants, hydric soils, and frequent flooding. Wetlands support valuable and complex ecosystems and consequently development is severely restricted if not prohibited in most wetlands. The Pierce County Wetlands Inventory map (Figure 2-7) identifies small wetlands scattered throughout Buckley. The wetlands are usually affiliated with the drainages that define the ridges with the City. Buckley has two wetlands within City limits, the Wickersham and the Dingle Basin.



Legend
CITY LIMITS & UGA


SOURCE: PIERCE COUNTY GIS

CITY OF BUCKLEY

SEWER COMPREHENSIVE PLAN

FIGURE 2-3

TOPOGRAPHY MAP



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Surface Waters and Drainage Basins

Lakes and streams are classified as sensitive areas due to the variety of plants and animals they support. The primary surface water feature within or near the City of Buckley sewer service area is White River. White River is a major tributary of the Puyallup River, which defines the northern edge of the City limits. White River also supplies Lake Tapps, west of the City, by diverting water from the Puget Power flume. The South Prairie Creek is located just outside City limits and one of its tributaries, Spiketon Creek, flows within City limits for a short distance through the northeastern corner of the City. Figure 2-8 shows the drainage basins around the City of Buckley.

Groundwaters and Recharge Areas

The aquifers in and around Buckley are not highly productive, providing a modest volume of potable water for the area. The majority of the City water production is generated by the South Prairie Creek. Production by source is summarized in Table 2-2. Figure 2-9 identifies the aquifer recharge areas in the Buckley area.

TABLE 2-2

Water Production by Source, 2008 through 2016

Year	South Prairie Creek		Naches Well 1		Well 2		Well 4		Rainier School Well 5		Trail Wells		Total
	MG	%	MG	%	MG	%	MG	%	MG	%	MG	%	MG
2008	162.9	74%	9.0	4%	18.8	9%	0.1	0%	30.0	14%	0.0	0%	220.9
2009	115.0	53%	19.2	9%	44.0	20%	1.9	1%	37.0	17%	0.0	0%	217.1
2010	117.5	66%	7.7	4%	41.0	23%	4.9	3%	6.4	4%	0.0	0%	177.5
2011	124.6	69%	5.9	3%	40.7	23%	8.2	5%	0.0	0%	0.0	0%	179.5
2012	131.3	73%	9.4	5%	37.1	21%	2.6	1%	0.0	0%	0.0	0%	180.4
2013	111.4	59%	12.7	5%	27.0	14%	0.0	0%	39.2	21%	0.0	0%	190.3
2014	109.7	54%	28.6	5%	17.1	8%	1.0	0%	46.0	23%	0.0	0%	202.5
2015	96.3	42%	43.8	19%	50.4	22%	0.6	0%	30.9	13%	7.3	3%	229.3
2016	105.0	49%	9.3	4%	40.3	19%	0.1	0%	34.2	16%	25.4	12%	214.3
Avg.	119.3	59%	16.2	8%	35.2	17%	2.2	1%	24.9	12%	3.6	2%	201.3

Fish and Wildlife Habitat

Fish and wildlife habitat is defined as areas essential for maintaining specifically listed species in suitable habitats. This definition was provided in “Fish and Wildlife Habitat Critical Area” section of WAC 365-190-080(5). The WAC further states that any proposed activity within 300 feet of these areas requires the preparation of a habitat assessment. This assessment is circulated to all the appropriate agencies for review. After agency review, a Habitat Management Plan may be required that would address the impacts the project would have on habitat, provide background information of specific species, and recommend protection and mitigation measures for those species.

After project implementation, an assessment and evaluation of the success of the identified measures is required. This plan is again circulated to the appropriate agencies for review. Minimum buffers from the critical habitat area may be required. As the main watercourses in the area, the habitat and water quality in White River are of particular concern.

VEGETATION

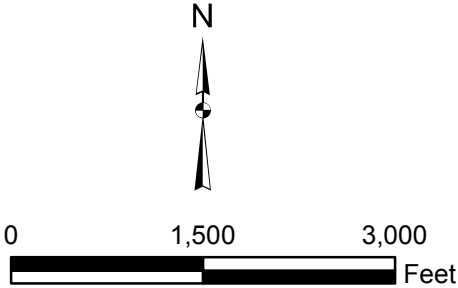
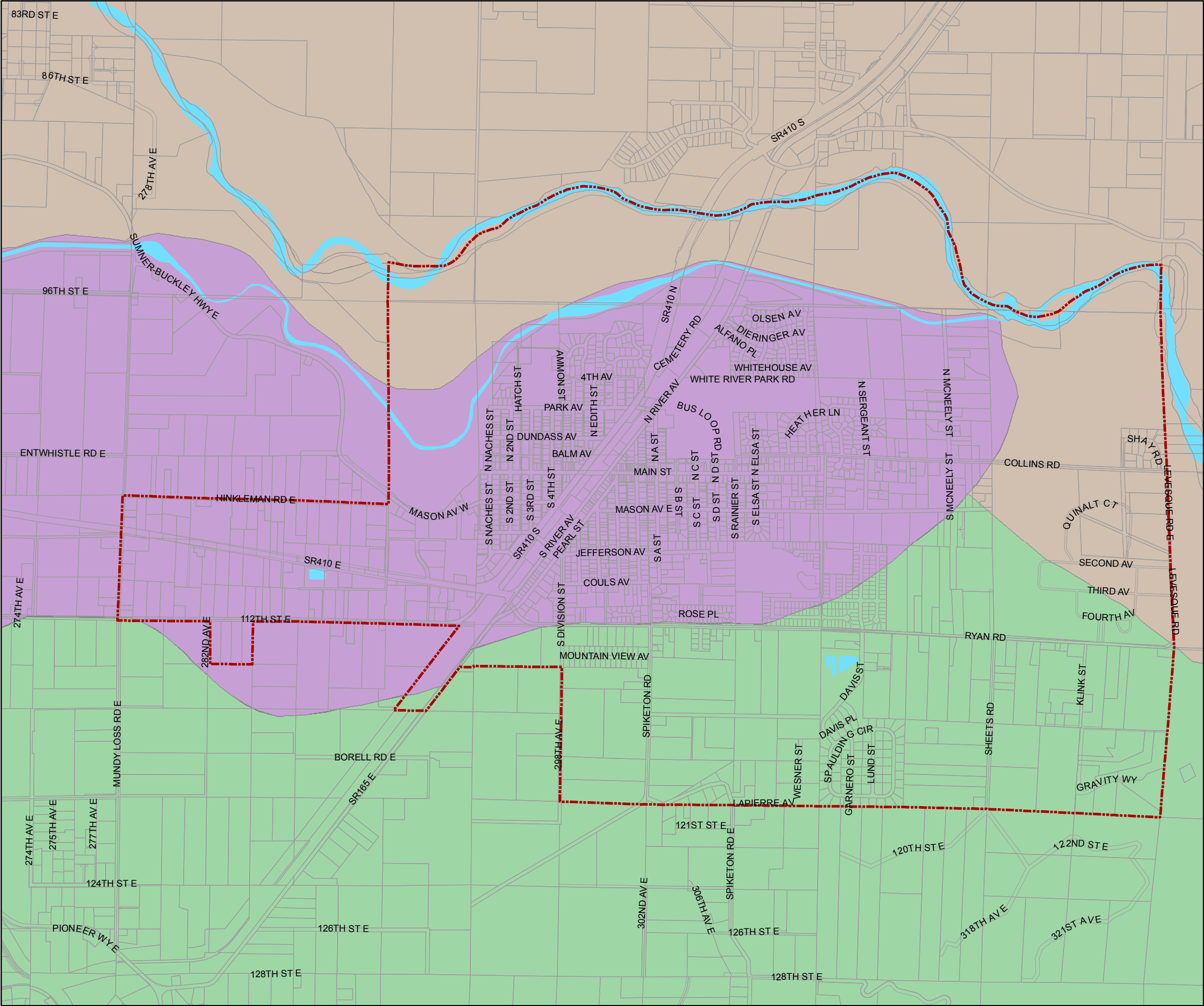
Much of the land within the City has been cleared for agricultural or rural development purposes. Native vegetation remains in the White River drainage and in other locations such as steep hillsides and ravines where development was impractical. The eastern side of the City is largely in grass pasture or blackberries where farming has been discontinued.

The dominant tree species in the Buckley area includes conifers such as Douglas-fir, western red cedar, and western hemlock. Pacific red alder, big leaf maple, and other deciduous trees make up a significant portion of the second and third growth forests along with native conifer species. Dense brush grows on both unstable and stable areas and consists predominantly of blackberries, huckleberries, salal, and various fern species. The dense forest and brush cover mediates runoff and provides for uptake of water. On individual residential lots, the vegetation varies from dense forest on larger lots, to grass lawns, landscaping with shrubs, and ornamental trees.

PUBLIC UTILITIES

Public utilities in the City of Buckley area include water, sewer, power, natural gas, and telephone. CenturyLink provides the telephone service to the area. Puget Sound Energy provides natural gas and electrical power to this area.

The City of Buckley provides water service within the City limits. Some homes in the less developed areas of the City are still on individual wells, but they are expected to eventually tie into the City water system as the system expands. Figure 2-10 shows the water system for the City of Buckley. The existing WWTP is not within 2,500 feet of any



Legend

- CITY LIMITS & UGA
- BASINS:**
 - LOWER WHITE RIVER
 - MUD MOUNTAIN
 - SOUTH PRAIRIE CREEK

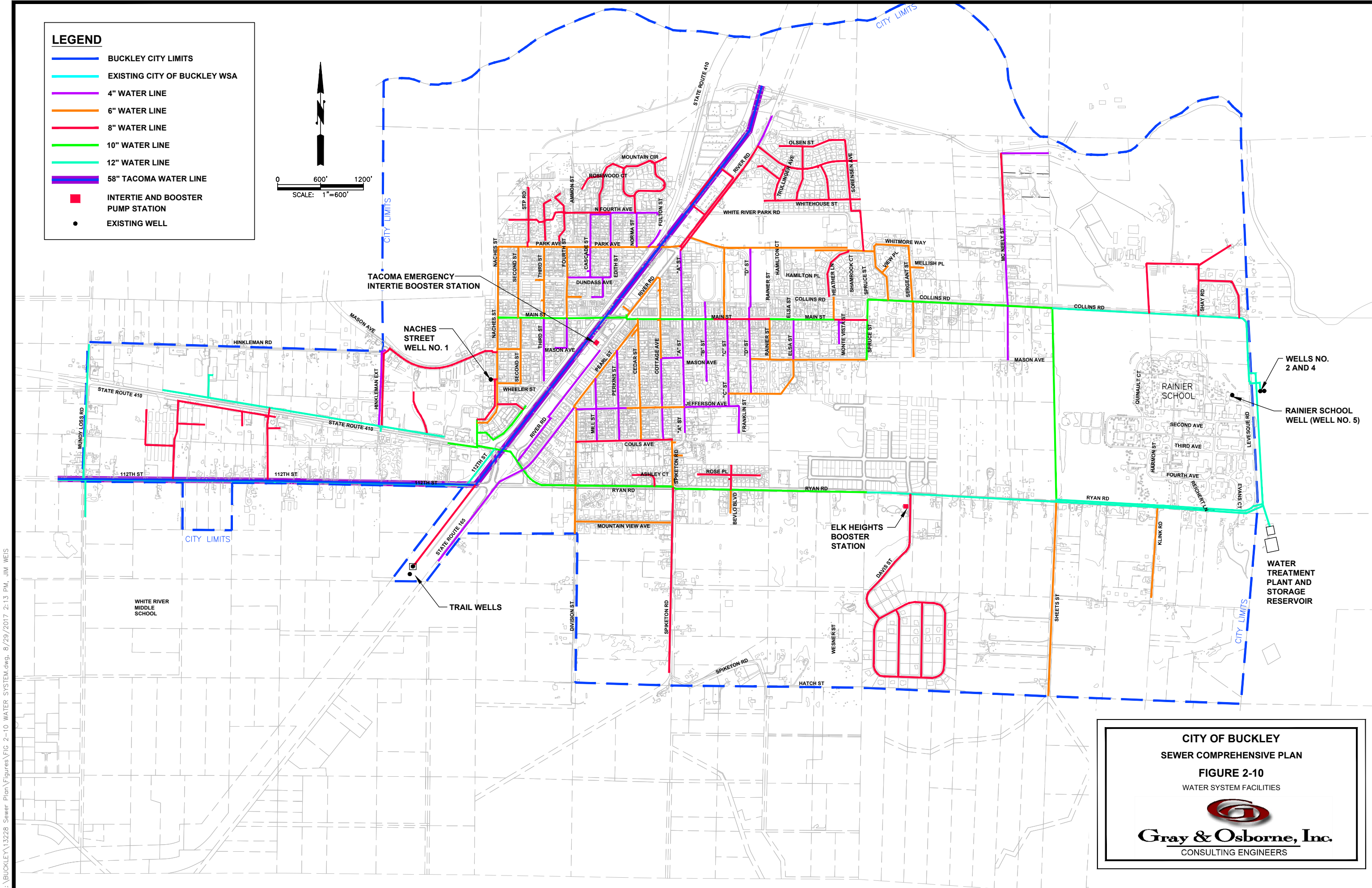
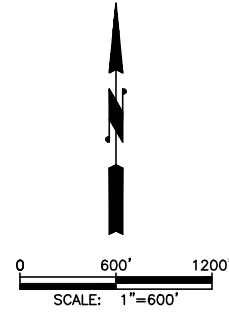
SOURCE: PIERCE COUNTY GIS

CITY OF BUCKLEY
SEWER COMPREHENSIVE PLAN
FIGURE 2-8
SURFACE WATER MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

LEGEND

- BUCKLEY CITY LIMITS
- EXISTING CITY OF BUCKLEY WSA
- 4" WATER LINE
- 6" WATER LINE
- 8" WATER LINE
- 10" WATER LINE
- 12" WATER LINE
- 58" TACOMA WATER LINE
- INTERTIE AND BOOSTER PUMP STATION
- EXISTING WELL



CITY OF BUCKLEY

SEWER COMPREHENSIVE PLAN

FIGURE 2-10

WATER SYSTEM FACILITIES



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public or private well. All public water supplies are shown on Figure 2-10. The City maintains a network of water distribution facilities designed to have minimum separation per the Department of Ecology's Criteria for Sewage Works Design.

ADJACENT WASTEWATER SERVICES

There are several providers of wastewater collection and treatment services within 5 miles of the City of Buckley's WWTP. The Enumclaw WWTP is approximately 2 miles to the northeast of Buckley and the Wilkeson WWTP is approximately 4 miles south of Buckley, which has a design capacity of approximately less than 1 MGD annually. There are no industrial WWTFs within the direct vicinity of the City of Buckley, although there are industrial WWTFs in Tacoma, Washington.

CHAPTER 3

LAND USE AND PLANNING CRITERIA

INTRODUCTION

The configuration of a wastewater system is influenced by land use, development trends and timing, regulatory requirements, the location of other utility systems, growth management, and topography. This Plan will develop a logical system of facilities to serve the City of Buckley based on topography, the drainage characteristics of the area, and the City's growth objectives.

BACKGROUND

The City of Buckley originally served as a residential community for the overnight booming economy of Wilkeson in the 1870's, and was first platted in 1888. The primary occupations for the community were coal mining, which began in the 1870's, and lumber and shingle mills, which began in the 1880's. The harvested coal, lumber and shingles were transported by the Northern Pacific Railway to various national and international markets. Buckley Logging Company mill ceased operations in 1944 ending railway logging. The last company operated coal mine discontinued in 1947, which prompted the Northern Pacific Railroad depot to be torn down in 1959. After a decade of varying population growth/decline, the City of Buckley has become a slowly growing community with residential, commercial, and industrial sources of wastewater. The City also has an elementary school, middle school, and high school. Much of the recent growth has derived from the housing and commercial markets that have reached the capacity limits in the Urban Growth Areas for the larger communities of Tacoma and Puyallup. These markets have now begun moving east to the City of Buckley.

RELATED PLANNING DOCUMENTS

The following plans and reports were used in the preparation of this Chapter.

- *City of Buckley Comprehensive Plan, 2015*
- *City of Buckley Comprehensive Sewer Plan, 2003*

GROWTH MANAGEMENT

The City of Buckley Comprehensive Plan was updated in 2015 and meets the requirements of the State Growth Management Act. The Plan is being updated in 2016 and 2017 to meet State requirements.

STUDY AREA

The study area consists of the City limits. The City can be described as consisting of several subareas that will be impacted by future growth. The first subarea is the historic downtown area located centrally on either side of Highway 410, which consists of the oldest part of the community. This area is largely built out, and is served by an existing gravity collection system. The second subarea is the land in the east, northeast and southeast portions of the City. This area is zoned to become largely residential. The third subarea is to the northwest of SR 410 and River Avenue and this area is built out and largely residential. The fourth subarea consists of the commercial/industrial zoned areas located in the west portion of the City along the east/west segments of SR 410. This part of the City is typically identified as commercial area and the zoning in this area is intended to attract family wage jobs to the City.

PLANNING PERIOD

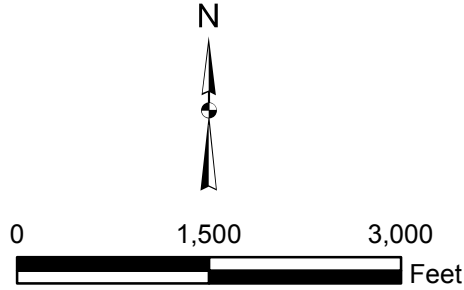
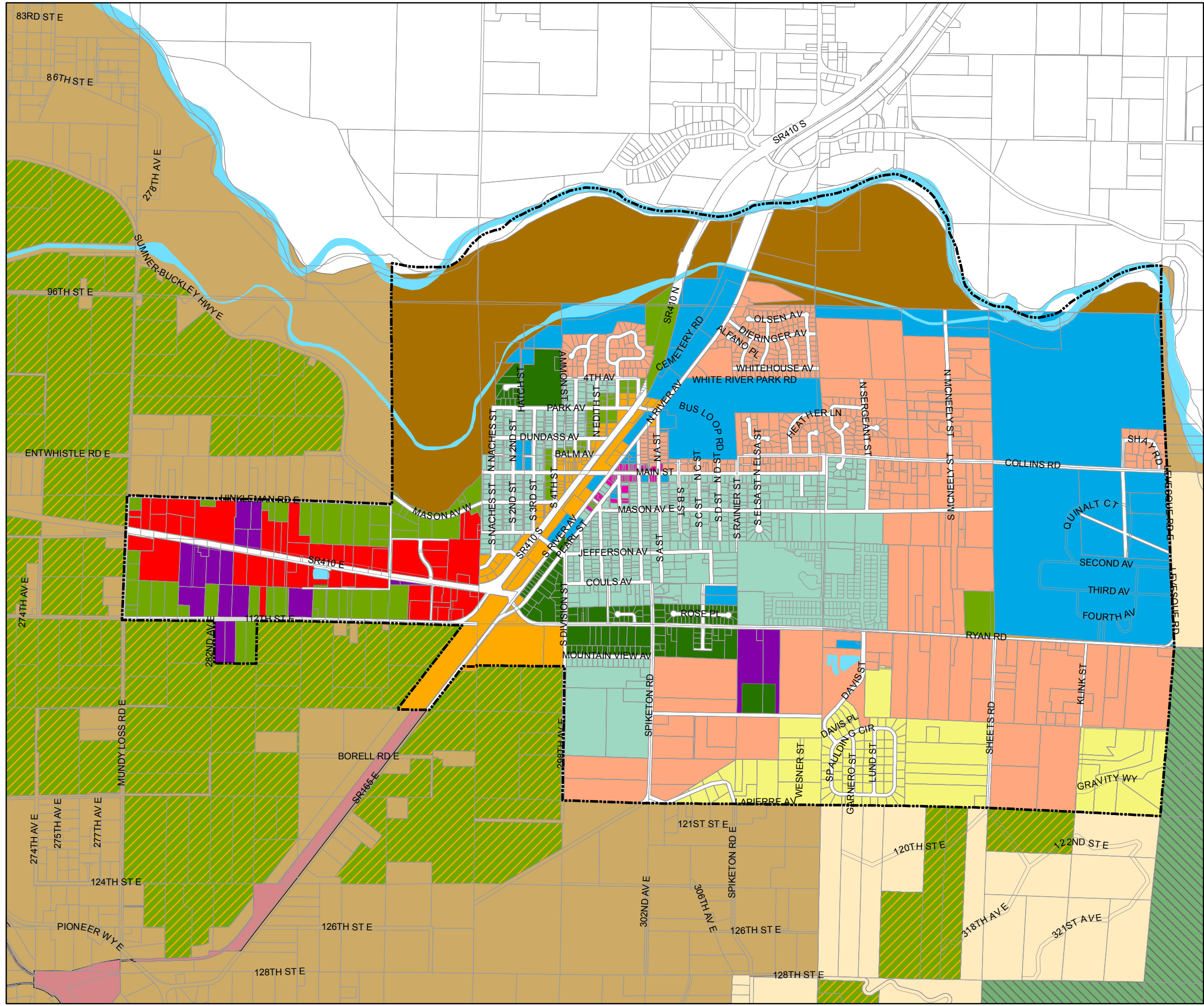
In order to provide wastewater services for growth, the wastewater system must be continuously evaluated and improved. A planning period for the evaluation of the wastewater utility should be long enough to be useful for an extended period of time, but not so long as to be impractical. The planning period for this General Sewer Plan is from 2016 through 2035, coinciding with a 20-year planning interval and in accordance with other regional planning documents. A 20-year collection system improvement schedule for 2016 to 2035 will also be provided to enable the City to plan collection system improvements for growth needs. Build out requirements are also identified for structures such as interceptors.

For an orderly and methodical approach to the expansion and financing of the City's wastewater system, time frames in increments of 5 years, up to 2035 are evaluated.

CURRENT LAND USE

The primary land use in Buckley is single-family residential, with major undeveloped areas of land within the City limits. Figure 3-1 provides the current land use zoning within the City of Buckley.

The City of Buckley is currently comprised of approximately 2,530 acres. Land use throughout the City can be categorized into 5 major land use categories: residential, mixed-use, commercial, industrial and public. The City of Buckley land use categories, the governing Municipal Code Chapter, total acreage for each land use category, and percentage of the total acreage are listed in Table 3-1. Figure 3-2 identifies the land use designations within the current City limits for the City of Buckley.



Legend

CITY LIMITS
BUCKLEY ZONING DESIGNATION:*

- CENTRAL COMMERCIAL
- GENERAL COMMERCIAL
- HISTORIC COMMERCIAL
- HIGH DENSITY RESIDENTIAL
- LIGHT INDUSTRIAL
- NEIGHBORHOOD MIXED USE
- PARKS / RECREATIONAL
- R-20,000 RESIDENTIAL
- R-8,000 RESIDENTIAL
- R-6,000 RESIDENTIAL
- SENSITIVE AREA

COUNTY ZONING DESIGNATION:**

- AGRICULTURAL RESOURCE LAND
- DESIGNATED FOREST LAND
- PARKS & RECREATION
- RURAL 10
- RURAL 20

SOURCE: *CITY OF BUCKLEY, **PIERCE COUNTY GIS

CITY OF BUCKLEY

SEWER COMPREHENSIVE PLAN

FIGURE 3-1
ZONING DESIGNATIONS



LAND USE DESIGNATIONS

The following bulleted list briefly describes each of the land use categories. For more information regarding land use categories specific references to the City's Municipal Code (in Chapter 19) are identified.

- Residential (R-6,000) - Intended to provide for compact residential development. For single-family dwellings, the new development minimum lot area is 6,000 sf except as permitted within a residential cluster or cottage housing development.
- Residential (R-8,000) – Intended to provide for urban residential densities while providing a transitional area between zones of higher urban residential densities and areas of lower densities, environmentally sensitive and public areas. For single-family dwellings, the new development minimum lot area is 8,000 sf except as permitted within a residential cluster or cottage housing development.
- Residential (R-20,000) – Intended to preserve or provide for large urban lots to serve as a transition from rural densities outside the urban growth area. Parcels within this zone are in areas of known or suspected geological or hydrological restriction. For single-family dwellings, the new development minimum lot area is 20,000 sf.
- Neighborhood Mixed Use (NMU) – Intended to allow development of small commercial businesses in residential neighborhoods, especially residential above ground floor commercial. For single-family dwellings, the minimum lot area is 8,000 sf.
- High Density Residential (HDR) – Intended to allow high density multifamily residential development, which includes apartment complexes. For single-family dwellings, the minimum lot area is 8,600 sf.
- General Commercial (GC) – Intended to develop commercial parcels oriented along primary transportation routes. New development has neither a minimum lot area nor maximum lot coverage.
- Central Commercial (CC) – Intended to develop commercial parcels for neighborhood-oriented businesses and pedestrian connectivity. New development must have a minimum lot area of 3,000 sf per unit, and maximum lot coverage of 75 percent.
- Historic Commercial (HC) – Intended to preserve and maintain commercial parcels for neighborhood-oriented businesses and pedestrian

connectivity. New development must have a minimum lot area of 3,000 sf, and does not have a maximum lot coverage.

- Light Industrial (LI) – New development must have a minimum lot area of 6,000 sf, and maximum lot coverage of 80 percent.
- Public (P) – Intended to provide public services for all public needs to create a strong and sustainable economy. New development has neither a minimum lot area nor maximum lot coverage.
- Environmentally Sensitive (S) – Intended to protect, conserve, and manage sensitive areas next to the shoreline, sustain the existing natural character of these sensitive areas, preserve or enhance the natural environment, and allow careful development of these areas for public enjoyment and recreation. New development has neither a minimum lot area nor maximum lot coverage.

TABLE 3-1

Existing Land Use Zones

Land Use Category	Governing City Code Chapter	Acreage⁽¹⁾	Percent of Total Acreage
Urban Residential			
Residential (R-6,000)	19.20	292.02	12.80%
Residential (R-8,000)	19.20	528.67	23.18%
Residential (R-20,000)	19.20	184.53	8.09%
High Density Residential (HDR)	19.20	62.54	2.74%
Urban Mixed-Use/Commercial/Industrial			
Neighborhood Mixed Use (NMU)	19.20	139.45	6.11%
General Commercial (GC)	19.20	100.65	4.41%
Central Commercial (CC)	19.20	62.57	2.74%
Historic Commercial (HC)	19.20	2.67	0.12%
Light Industrial (LI)	19.20	56.11	2.46%
Urban Public			
Public (P)	19.20	438.66	19.23%
Sensitive (S)	19.20	412.89	18.10%
Unzoned Parcels	19.20	0.35	0.02%
TOTAL		2,281.11	100.0%

(1) Acreages calculated based on land use mapping.

POPULATION

EXISTING POPULATION

Population records for the City of Buckley were obtained from the Washington State Office of Financial Management (OFM). The populous information is summarized in Table 3-2. This population data and other projections in this Plan reflect the population within the City limits, including the residents of Rainier School. Note that this data will differ slightly from the sewer service system population, assuming that there are residences within City limits that are not on City sewer.

TABLE 3-2

City of Buckley Population 1991 to 2016⁽¹⁾

Year	Population
1991	3,606
1992	3,690
1993	3,835
1994	3,915
1995	3,962
1996	3,979
1997	3,979
1998	3,977
1999	4,001
2000	4,145
2001	4,420
2002	4,467
2003	4,443
2004	4,419
2005	4,387
2006	4,378
2007	4,363
2008	4,338
2009	4,387
2010	4,354
2011	4,345
2012	4,365
2013	4,370
2014	4,430
2015	4,440
2016	4,550
Average Growth Rate	0.95%

(1) Washington State Office of Financial Management (OFM) Estimates

Washington State Office of Financial Management (OFM) data indicates that the City of Buckley population increased from 3,606 in 1991 to 4,550 in 2016, which yields an average annual growth rate of approximately 0.95 percent.

POPULATION PROJECTION

The *City of Buckley 2015 Comprehensive Plan*, indicated a population of 4,145 for 2000 and a projected population of 7,888 for 2035.

The OFM intercensal population estimates, City of Buckley population projection at the historic annual growth rate of 0.95 percent, the Pierce County 2011 growth allocation, and population projections from the *City of Buckley 2015 Comprehensive Plan*, are shown in Figure 3-3, below. The projected County growth allocation of 4,560 (in 2008) to 7,300 (in 2030) and projection at 1 percent growth until 7,888 (in 2035) [shown in Table 3-3].

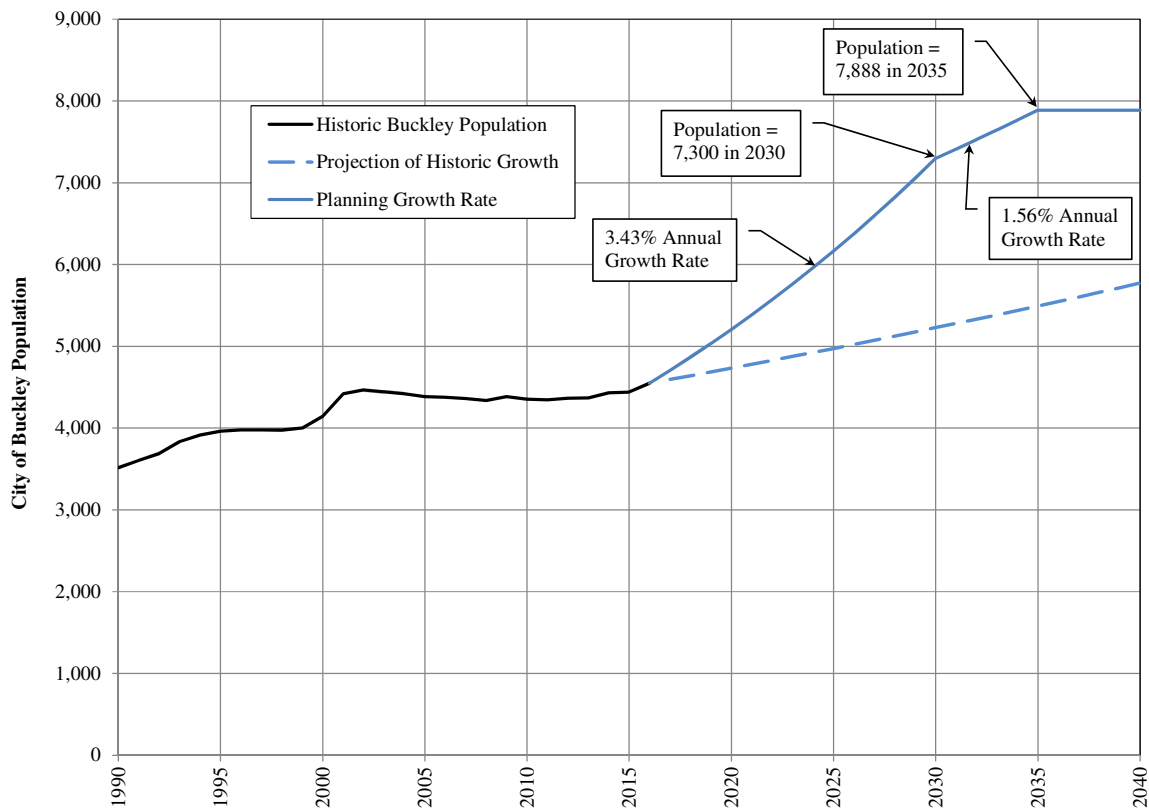
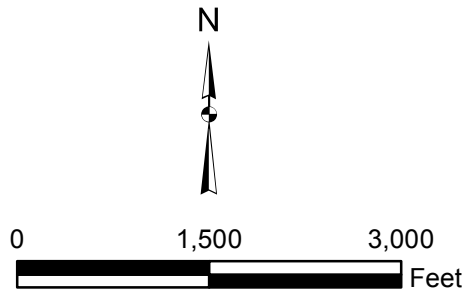
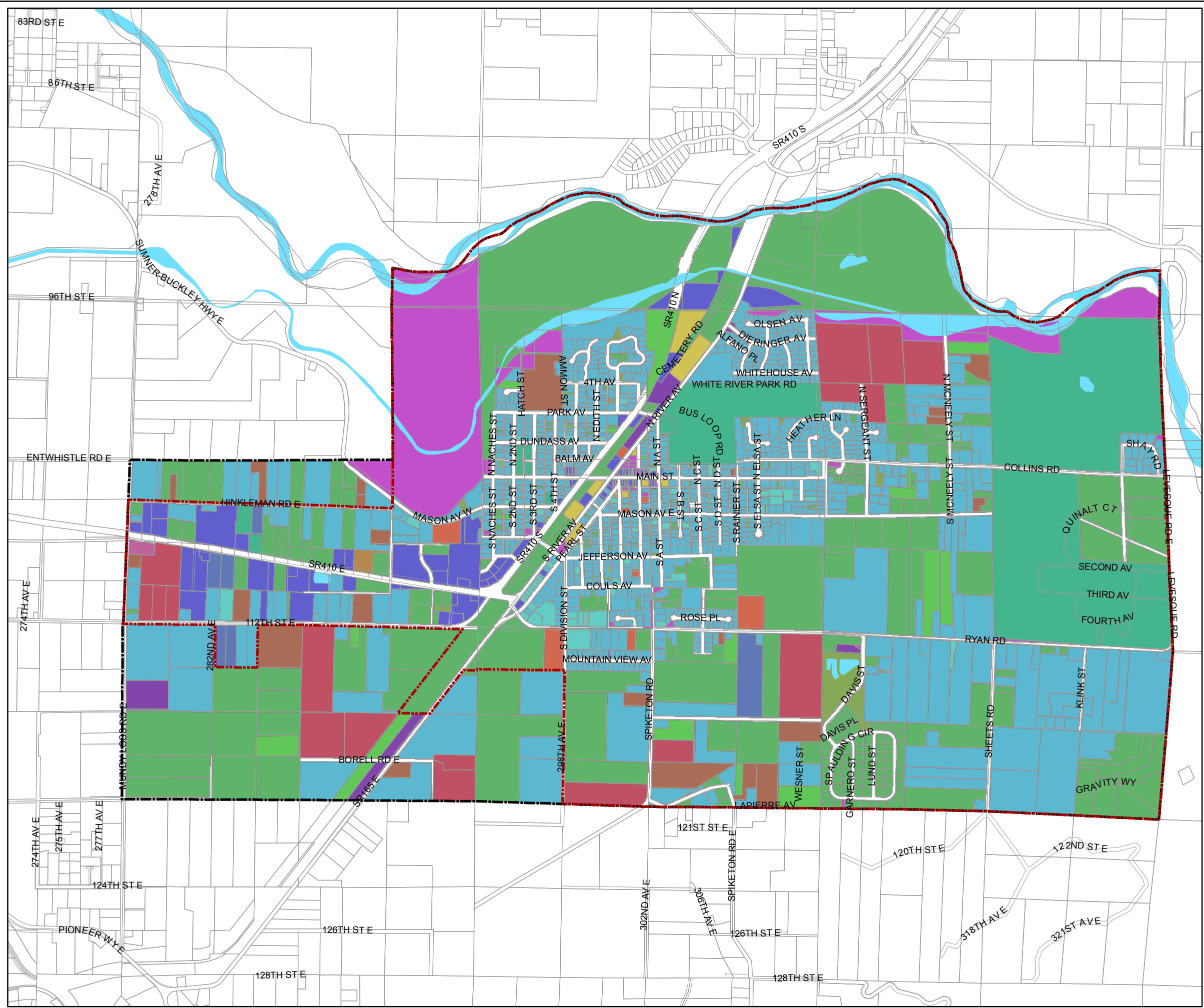


FIGURE 3-3

City of Buckley Historic and Projected Populations

The City of Buckley reports that there are currently plats approved and in the works for 293 residential lots to be built within the next 3 to 5 years. At an estimated average of



Legend

- CITY LIMITS
- UGA BOUNDARY
- LAND USE DESIGNATIONS:**
 - Commercial/Service
 - Education
 - Group Quarters/Other
 - Industrial
 - Mobile Homes
 - Multi-Family Residential
 - Open Space/Recreation
 - Public Facilities
 - Quasi-Public Facilities
 - Residential Outbuildings
 - Resource Land
 - Single-Family Residential
 - Transportation, Communication, Utilities
 - Unknown
 - Vacant
 - Water Bodies

CITY OF BUCKLEY

FIGURE 3-3
LAND USE MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

2.5 persons per household, the estimated population increase from these plats is 733, yielding a 4.1 percent growth rate. Estimating this to occur within 5 years, the population estimate for 2020 is 4,706. In order to reach a population of 7,500 in 2030 as designated in the Pierce County Ordinance 2011-36s, the City will feature an average growth rate of 3.43 percent from 2017 to 2030. Although population trends indicate an annual growth rate of 2.96 percent seem conservative, the developing plats indicate significant growth is likely to occur.

For purposes of the General Sewer Plan, annual population growth rates of 3.43 percent (through 2030) and 1.56 percent (2030 through 2035) will be assumed. The City must bring on an average of 3.21 percent new sewer connections each year until 2035 before the entire City population will be completely connected. The projected population growths through 2035 are identified in Table 3-3.

TABLE 3-3
Population Projections 2016 to 2035

Year	City of Buckley Population	Sewered Population
2016	4,550	4,112
2017	4,706	4,291
2018	4,868	4,476
2019	5,035	4,667
2020	5,208	4,863
2021	5,387	5,066
2022	5,572	5,275
2023	5,763	5,490
2024	5,961	5,712
2025	6,166	5,941
2026	6,378	6,177
2027	6,597	6,421
2028	6,823	6,672
2029	7,058	6,932
2030	7,300	7,199
2031	7,414	7,338
2032	7,530	7,479
2033	7,647	7,621
2034	7,767	7,767
2035	7,888	7,888

GROWTH PROJECTION CONSIDERATIONS

When developing the projected annual average growth rate several factors must be considered. If Buckley experiences significant population growth in the near future, then this plan should adequately prepare for such growth. While a conservative projected annual average growth rate would adequately prepare the City for such an event, it could also provide inaccurate data if such significant growth does not occur.

CHAPTER 4

REGULATORY REQUIREMENTS

INTRODUCTION

The purpose of this chapter is to identify and summarize the regulations that affect the planning, design and approval of improvements discussed in this report. These regulatory requirements were used in developing the design criteria for the City of Buckley's wastewater collection, treatment, and disposal systems.

This chapter does not describe each regulation in detail; rather, it addresses important facets of the regulations that affect the planning and design process. Subsequent sections of this report address technical requirements of the regulations at a level of detail appropriate for the evaluation provided by that section. The regulatory requirements relating to the City's existing NPDES permit are presented in this chapter to provide background and requirements relating to the WWTP and any potential expansion beyond the current capacity.

FEDERAL AND STATE STATUTES, REGULATIONS, AND PERMITS

In this section, some of the various State and Federal laws that may affect wastewater system construction and operations are discussed, as well as other relevant permits, programs, and regulations.

FEDERAL CLEAN WATER ACT

The Federal Water Pollution Control Act is the principal law regulating the water quality of the nation's waterways. Originally enacted in 1948, it was significantly revised in 1972 and 1977, when it was given the common title of the "Clean Water Act" (CWA). The CWA has been amended several times since 1977. The 1987 amendments replaced the Construction Grants program with the State Revolving Fund (SRF), which provides low-cost financing for a range of water quality infrastructure projects.

The National Pollutant Discharge Elimination System (NPDES) is established by Section 402 of the CWA and subsequent amendments. The Department of Ecology (Ecology) administers NPDES permits for the United States Environmental Protection Agency (EPA) in Washington State. Most NPDES permits have a 5-year life span and place limits on the quantity and quality of pollutants that may be discharged. NPDES permits granted under Phase I of the CWA are required for point source discharges, including wastewater discharges to surface waters from municipal or industrial wastewater treatment facilities, stormwater discharges from industrial facilities, runoff

from construction sites of more than five acres, and stormwater discharges from separate storm sewers serving populations of more than 100,000.

The City's current NPDES permit, No. WA0023361, along with the permit Fact Sheet, is attached as Appendix A.

The City's permit most recent NPDES permit was issued in 2003. That permit expired in 2008. However, Ecology administratively extended that permit and requires the City to monitor the influent and effluent and comply with the limitations specified in the expired permit. Ecology is currently writing a new fact sheet and NPDES permit based on current treatment plant and receiving water conditions.

Section 303 of the CWA established the Total Maximum Daily Load (TMDL) program. Under this program, states must establish a list of water bodies that will not achieve water quality standards even with "all known available and reasonable technology (AKART)" in place. In such situations, Ecology conducts a TMDL analysis to determine the capacity of the water body to absorb pollutants and allocates pollutant loads among point and nonpoint discharges. Based on this loading capacity, "waste load allocations" are established for different pollutant sources in the watershed. White River has been identified as being compliant with applicable water quality criteria.

Section 307 of the CWA established the National Pretreatment Program. This program is designed to protect publicly owned treatment works (POTWs) and limits the amount of industrial or other non-residential pollutant discharged to municipal sewer systems.

A 401 Water Quality Certification is required under the CWA for any activity that may result in discharge to surface waters including excavation activities that occur in streams, wetlands, or other waters of the nation. The USEPA has delegated 401 Certification to the Department of Ecology.

Section 404 of the CWA regulates discharges of fill or dredged materials in wetlands, including any related draining, flooding, and excavation. Pipeline and pump station projects in wetlands will require a Section 404 permit, in addition to any related local permits. In most cases, activities impacting greater than 1/3 of an acre will also require a Section 401 Certification.

FEDERAL ENDANGERED SPECIES ACT

On March 16, 1999, the National Marine Fisheries Service (NMFS) listed the Puget Sound Chinook as "threatened" under the Endangered Species Act (ESA). In 1999, the United States Fish and Wildlife Service (USFWS) listed the Bull Trout as "threatened." Listing of other salmon species has followed in the last several years. These ESA listings have significantly impacted activities that affect salmon and trout habitat, such as water use, land use, construction activities, and wastewater disposal. Impacts to the City have

included longer timelines for permit applications, and more stringent regulation of construction impacts and activities in riparian corridors.

The purpose of the 1972 ESA is to “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved...” In pursuit of this goal, the ESA authorizes NMFS and USFWS to list species as endangered or threatened, and to identify and protect the critical habitat of listed species. USFWS has jurisdiction over terrestrial and freshwater plants and animals such as Bull Trout, while NMFS is responsible for protection of marine species including anadromous salmon. Under the ESA, endangered status is conferred upon “any species which is in danger of extinction throughout all or a significant portion of its range,” while threatened status is conferred upon “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The ESA defines critical habitat as the “geographical area containing physical and biological features essential to the conservation of the species.”

Once a species is listed as endangered or threatened, the ESA makes it illegal for the government or individuals to “take” a listed species. “Take” has been interpreted by the federal courts to include “significant modification or degradation of critical habitat” that impairs essential behavior patterns. For species listed as endangered, the blanket prohibitions against “take” are immediate.

The ESA Section 9 “take” prohibition applies to all “persons” including local public entities. State and local governments may face double exposures through both their direct conduct and through the exercise of the regulatory authorities over activities, which can be construed as a “take.”

Federal rules also allow threatened species to be protected through a more flexible Section 4(d) rule describing specific activities that are likely to result in a “take.” The draft of the Section 4(d) rule prepared by NMFS was published in the Federal Register on January 3, 2000 (Federal Register, Vol. 65, No. 1). The final 4(d) rule was published in June 2000 and became effective January 8, 2001.

The 4(d) rules may exempt certain activities from “take” liabilities and thereby offer an alternative mechanism by which to secure relief from potential “take” liability. The 4(d) rule approves some specific existing state and local programs, and creates a means for NMFS to approve additional programs if they meet certain standards set out in the rule. NMFS published “A Citizen’s Guide to the 4(d) Rule for Threatened Salmon and Steelhead on the West Coast” in June 2000. The guide introduces and explains the rule. The following discussion summarizes this guide.

Section 4(d) requires NMFS to issue regulations deemed “necessary and admissible to provide for the conservation to the species.” NMFS must establish protective rules for all species now listed as threatened under the ESA. The rules need not prohibit all “take.” There may be an “exception” from the prohibitions on take so long as the take occurs as

the result of a program that adequately protects the listed species and its habitat. The 4(d) rule can “limit” the situations to which the take prohibitions apply. By providing limitation from take liability, NMFS encourages governments and private citizens to adjust their programs and activities to be “salmon safe.”

One of the limitations on the take prohibitions contained in the 4(d) rule is Limit No. 12 – Municipal, Residential, Commercial, and Industrial development and redevelopment (MRCI). The 4(d) rule recognizes that MRCI development and redevelopment have a significant potential to degrade habitat and injure or kill salmon and steelhead in a variety of ways. The 4(d) guide states that with appropriate safeguards, MRCI development can be specifically tailored to minimize impacts on listed fish to the extent that additional Federal protections would not be needed to conserve the listed ESU. The guide further states that NMFS would individually apply the following 12 evaluation considerations when determining whether MRCI development ordinances or plans adequately conserve listed fish:

1. A MRCI development ordinance or plan ensures that development will avoid inappropriate areas such as unstable slopes, wetlands, areas of high habitat value, and similarly constrained sites.
2. A MRCI development ordinance or plan adequately prevents stormwater discharge impacts on water quality and quantity and stream flow patterns in the watershed – including peak and base flows in perennial streams.
3. A MRCI development ordinance or plan protects riparian areas well enough to attain or maintain Proper Functioning Condition (PFC), habitat that provided for the biological requirements of the fish, around all rivers, estuaries, streams, lakes, deepwater habitats, and intermittent streams.
4. A MRCI development ordinance or plan avoids stream crossings – whether by roads, utilities, or other linear development – wherever possible and, where crossings must be provided, minimize impacts.
5. A MRCI development ordinance or plan adequately protects historic stream meander patterns and channel migration zones and avoids hardening stream banks and shorelines.
6. A MRCI development ordinance or plan adequately protects wetlands, wetland buffers, and wetland function – including isolated wetlands.
7. A MRCI development ordinance adequately preserves permanent and intermittent streams’ ability to pass peak flows.
8. A MRCI development ordinance or plan stresses landscaping with native vegetation to reduce the need to water and apply herbicides, pesticides,

and fertilizer.

9. A MRCI development ordinance or plan contains provisions to prevent erosion and sediment run-off during (and after) construction and thus prevent sediment and pollutant discharge to streams, wetlands and other water bodies that support listed fish.
10. A MRCI development ordinance or plan ensures that demands on the water supply can be met without affecting either directly or through groundwater withdrawals – the flows salmon need.
11. A MRCI development ordinance or plans provides mechanisms for monitoring, enforcing, funding, reporting, and implementing its program.
12. A MRCI development ordinance or plan complies with all other state and Federal environmental and natural resource laws and permits.

In response to existing and proposed ESA listings of salmon, steelhead, and trout species throughout Washington State, Governor Locke established the Office of Salmon Recovery in 1997 to direct the State's salmon recovery efforts. The Office of Salmon Recovery is also supported by the Joint Natural Resources Council (composed of representatives of state natural resource agencies) in the preparation of the Statewide Strategy to Recover Salmon, entitled "Extinction is Not an Option" (January 1999). The goal of the Statewide Strategy is to restore wild salmon, steelhead, and trout populations to harvestable levels. Rather than attempting to avert additional ESA listings, the Statewide Strategy intends to provide local input into, and hopefully maintain some local control over the salmon recovery regulatory processes that will inevitably affect the majority of Washington State. The Statewide Strategy was submitted to NMFS in 1999 for possible inclusion in the Section 4(d) rule. The draft of the Section 4(d) rule was published in the Federal Register on January 3, 2000 (Federal Register, Vol. 65, No. 1). The final 4(d) rule was published in June 2000 and became effective January 8, 2001. The Statewide Strategy to Recover Salmon was not included in the 4(d) rule.

In order to minimize liability under the ESA, local governments must demonstrate that their land use regulations will not result in a prohibited "take" of a listed species, including adverse modification of critical habitat. Possible regulatory impacts may include the following:

- Adopt model critical areas ordinances designed to protect critical habitat.
- Amend critical areas ordinances to include riparian buffers, vegetation retention, soil retention, maximum road density within a watershed, maximum impervious surface in a watershed, and limits on road crossings of streams.

- Amend GMA comprehensive plans to require an “environmental protection element.
- Adopt stormwater operation and maintenance ordinances requiring regular, frequent maintenance of stormwater facilities.
- Increase inspection and enforcement of stormwater best management practices.
- Require monitoring of best management practices.
- Provide adequate funding of stormwater infrastructure, which may include implementation of stormwater utilities.
- Amend Shoreline Master Programs to encourage greater use of conservancy and natural designations, and limit conversion of agricultural and forest land.

It should be noted that the ESA includes a third-party citizen suit provision. Compliance with the Section 4(d) rule does not, therefore, rule out legal challenges, although it is likely to provide greater protection from successful litigation.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) was established in 1969 and requires Federal agencies to determine environmental impacts on all projects requiring Federal permits or funding. Federally delegated activities such as NPDES permits or Section 401 Certification are considered state actions and do not require NEPA compliance. If a project involves federal action (through, for example, an Army Corps of Engineers Section 404 permit), and is determined to be environmentally insignificant, a Finding of No Significant Impact (FONSI) is issued, otherwise an Environmental Impact Statement (EIS) is required. NEPA is not applicable to projects that do not include a Federal component that would trigger the NEPA process.

FEDERAL CLEAN AIR ACT

The Federal Clean Air Act requires all wastewater facilities to plan to meet the air quality limitations of the region. The City falls in the jurisdiction of the Puget Sound Clean Air Authority. An air quality permit for the City of Buckley’s WWTP is not required.

STATE STATUTES, REGULATIONS AND PERMITS

STATE WATER POLLUTION CONTROL ACT

The intent of the state Water Pollution Control Act is to “maintain the highest possible control standards to ensure the purity of all waters of the state consistent with public health and the enjoyment...the propagation and protection of wildlife, birds, game, fish, and other aquatic life, and the industrial development of the state.” Under the Revised Code of Washington (RCW) 90.48 and the Washington Administrative Code (WAC) 173-240, Ecology issues permits for wastewater treatment facilities and also land application of wastewater under WAC 246-271.

Submission of Plans and Reports for Construction of Wastewater Facilities, WAC 173-240

Prior to construction or modification of domestic wastewater facilities, engineering reports and plans, and specifications must be submitted to and approved by Ecology. This regulation outlines procedures and requirements for the development of an engineering report, which thoroughly examines the engineering and administrative aspects of a domestic wastewater facility project. This regulation defines a facility plan as described in Federal regulations, 40 CFR Part 35, as an engineering report.

Key provisions of WAC 173-240 are provided below.

- An engineering report for a wastewater facility project must contain everything required for a general sewer plan unless an up-to-date general sewer plan is on file with Ecology.
- An engineering report shall be sufficiently complete so that Plans and Specifications can be developed from it without substantial changes.
- A wastewater facility engineering report must be prepared under the supervision of a professional engineer.
- The engineering report shall include the following information (letter designations are taken from WAC 173-240-060; requirements that include those found in 40 CFR 35.917 for federal facility plan requirements are noted with an asterisk, “*”).
 - (a) Name, address, phone number of owner.
 - (b) Project description.
 - (c) Current and projected wastewater flows and loadings.
 - (d) Treatment standards.
 - (e) Receiving water characteristics, including dilution zone.

- (f) Proposed treatment and disposal process, including an evaluation of alternatives.*
- (g) Basic design data and calculations for each unit process.
- (h) Site availability and relationship to 25/100 flood cycles and residential or developed areas.
- (i) Flow diagram with hydraulic profile.
- (j) Discussion of inflow and infiltration.*
- (k) Provisions for treating industrial waste, including pre-treatment programs.*
- (l) Outfall analysis.
- (m) Method of final sludge disposal and alternatives considered.
- (n) Provisions for future needs.
- (o) Staffing and testing requirements.
- (p) Estimated capital and O&M costs, evaluated in terms of annual costs and present worth.*
- (q) A statement regarding compliance with any applicable state or local water quality plan.
- (r) A statement regarding compliance with the State (or National) Environmental Policy Act, SEPA (or NEPA) as applicable.

All requirements of WAC 173-240 have been met for the City's existing WWTP.

Criteria for Sewage Works Design, Washington State Department of Ecology

Ecology has published design criteria for collection systems and wastewater treatment plants. While these criteria are not legally binding, their use is strongly encouraged by Ecology since the criteria are used by the agency to review engineering reports for upgrading wastewater treatment systems. These design criteria, commonly referred to as the "Orange Book," primarily emphasize unit processes through secondary treatment. Any expansion or modification of the City of Buckley collection system and/or treatment plant will require continued conformance with Ecology criteria.

Certification of Operators of Wastewater Treatment Plants, WAC 173-230

Wastewater treatment plant operators are certified by the State water and wastewater operators' certification board. The operator assigned overall responsibility for operation of a wastewater treatment plant is defined by WAC 173-230 as the "operator in responsible charge." This individual must have State certification at or above the classification rating of the plant.

The City of Buckley Wastewater treatment plant is currently assigned a Class II rating. Level 2 operators are on staff for operation of the plant. The plant is staffed Monday through Friday from 7:00 a.m. to 3:30 p.m. A one hour plant check is conducted on weekends and holidays and a staff person is on call at all times to respond to alarm calls. The City staff also handles collection system maintenance and operates the water system.

The total staff time dedicated to the plant is estimated to be 3 full-time employees (FTEs). Upon issuance of an anticipated new NPDES Permit with a maximum month flow limit of 2.14 MGD, the WWTP may be assigned a Class III rating.

WATER QUALITY STANDARDS FOR SURFACE WATERS OF THE STATE OF WASHINGTON, CHAPTER 173-201A WAC

Basis of Regulations

The State of Washington has authority under the Federal Water Pollution Control Act, also known as the Clean Water Act, (CWA) to establish and administer programs to meet the requirements of the CWA. Under RCW 98.40.35, the Washington Department of Ecology has the authority to establish “rules and regulations relating to standards of quality for waters of the State and for substances discharged therein...” The State of Washington also implements the National Pollutant Discharge Elimination System (NPDES) program, created under the CWA.

Description of Regulations

WAC 173-201A establishes water quality standards for the State of Washington. The State adopted revised water quality standards in 2003, 2006, and 2011 which have been approved by the EPA. The standards are based on two objectives: protection of public health and enjoyment, and protection of fish, shellfish, and wildlife. For each surface water body in the state, the revised standards assign specific uses, such as aquatic life, recreation, or water supply uses. Water quality standards have been developed for each use, for parameters such as fecal coliform, dissolved oxygen, temperature, pH, turbidity, and toxic, radioactive, deleterious substances. The water uses that are defined in the standards for freshwater are:

Aquatic life uses

- Char spawning and rearing
- Salmon and trout spawning, core rearing, and migration
- Salmon and trout spawning, non-core rearing, and migration
- Salmon and trout rearing and migration only
- Non-anadromous interior redband trout
- Indigenous warm water species

Recreational uses

- Extraordinary primary contact recreation
- Primary contact recreation
- Secondary contact recreation

Water supply uses

- Domestic water supply
- Agricultural water supply
- Industrial water supply
- Stock water supply

Miscellaneous uses

- Wildlife habitat
- Harvesting
- Commerce and navigation
- Boating
- Aesthetics

Water Quality Classification

The City's existing WWTP discharges to White River. White River is a tributary to the Puyallup River. WAC 173-201A-602 identifies the following uses in the segment of concern:

- Aquatic life use: Core summer habitat
- Recreation use: Primary contact
- Water supply uses: Domestic water, industrial water, agricultural water, industrial water, and stock water
- Miscellaneous uses: Wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

Water quality criteria for the core summer habitat use is shown in Table 4-1:

TABLE 4-1**Water Quality Criteria for the
Core Summer Habitat**

Parameter	Surface Water Criteria Value
Dissolved Oxygen	>9.5 mg/L
Temperature	16 degrees C (60.8 degrees F) (7-day average of daily maximum), (1) with no increase greater than $t=28/(T+7)$ or (2) incremental temperature increase resulting from the combined effect of all nonpoint source activities in the water must not exceed 2.8 degrees C (5.04 degrees F)
pH	Not outside the range of 6.5 to 8.5 standard units, with no human- caused variation >0.2 standard units
Turbidity	<5 NTU over background (background ≤ 50 NTU) <10% increase over background (background >50 NTU)
Total dissolved gas	<110% of saturation at any point of sample collection
Ammonia	<0.233 mg/L

The bacterial water quality criteria for White River is based on the assigned recreational use as follows:

Freshwater

- Primary contact recreation: <100 fecal coliform colonies/100 mL (with <10 percent of all samples obtained for calculating the geometric mean value exceeding 200 colonies/ 100 mL)

The water supply and miscellaneous uses do not have additional numerical criteria.

The water quality standards also have narrative criteria regarding toxic, radioactive, otherwise deleterious materials, or materials that impair aesthetics. These materials are prohibited in concentrations that affect aquatic life, human health or impair aesthetics.

Numeric criteria for 31 toxic substances are listed in WAC 173-201A-240. Criteria are listed on both an acute and chronic basis and for certain substances (e.g., metals, chlorine, and ammonia), the criteria must be calculated as a function of receiving water pH, hardness, and whether salmonids are present.

The water quality standards allow for variances and site-specific criteria to be developed in individual cases.

As noted previously, White River has non attainment status for fecal coliforms and temperature. The measurements that support the non attainment status were taken upstream of the WWTP outfall.

To remove a use from the list of uses for which a water body is protected, a use attainability analysis (UAA) must be performed. The UAA must demonstrate that the use does not exist in the water body or would not be attainable. The proposed change to the assigned uses must be consistent with Federal laws and subject to a public involvement process including consultations with Native American tribes.

Mixing Zones

WAC 173-201A-400 has provisions for mixing zones for a permitted discharge. Deviations from water quality standards for the surface water are allowed within the mixing zone. Mixing zones are allowed under the following conditions:

1. All known, available, and reasonable treatment (AKART) is applied prior to discharge to the mixing zone.
2. Water quality is not violated outside the mixing zone boundary.
3. When potential does not exist for damage to sensitive ecosystem or aquatic habitat, adverse public health effects, or interference with characteristic uses of the water.

The City's treatment plant outfall currently discharges near the bank of the White River in a channel that parallels the course of the river during low flows and merges with the river downstream at a bend in the river. The City's existing outfall and receiving water can provide sufficient dilution to assimilate a maximum month flow of at least 1.0 MGD. The City plans to perform a new mixing zone analysis, based on pH concerns in the White River and the anticipated new NPDES Permit with a maximum month flow limit of 2.14 MGD.

Anti-Degradation Policy

The anti-degradation policy aims to maintain the highest possible quality of water in the State, by preventing the deterioration of water bodies that currently have higher quality than the water quality standards require. The revised water quality standards define three tiers of waters in the anti-degradation policy.

Tier I water bodies are those with violations of water quality standards, from natural or human-caused conditions. The focus of water quality management is on maintaining or improving current uses, and preventing any further human-caused degradation.

Tier II water bodies are those of higher quality than required by the water quality standards. The focus of the policy is on preventing degradation of the water quality, to preserve the excellent natural qualities of the water body. New or expanded actions are

not allowed to cause a “measurable change” in the water quality, unless they are demonstrated to be “necessary and in the overriding public interest”.

Tier III water bodies are those in outstanding national resource waters (ONRWs). Except for certain temporary changes, water quality cannot be lowered in such waters. ONRWs generally include the highest quality waters of the United States. However, the ONRW classification also offers special protection for waters of exceptional ecological significance (those which are important, unique, or sensitive ecologically).

New or expanded actions that may cause a measurable change in water quality must have a Tier II review conducted. For increased wastewater treatment plant discharges, this review will take place as part of the NPDES permit modification process. Measurable change, for the purpose of the anti-degradation policy, is defined as follows:

- Temperature increase greater than 0.3 degrees C
- Dissolved oxygen concentration decrease greater than 0.2 mg/L
- Bacteria level increase greater than 2 CFU/100 mL
- pH change greater than 0.1 standard units
- Turbidity increase greater than 0.5 NTU
- Any detectable change in concentration of toxic or radioactive substances, which include ammonia and chlorine.

To meet anti-degradation standards for ammonia, the permitted effluent discharge limits for ammonia will decrease as the permitted flow capacity of the facility increases.

A new or expanded action may be determined by the Department of Ecology to be necessary and in the overriding public interest based on a review of the following factors:

- Economic benefits, such as job creation
- Providing or contributing to necessary social services
- Status as a demonstration project using innovative technical or management approaches that produce a significant improvement over AKART
- Prevention or remediation of environmental or public health threats
- Societal or economic benefits of better health protection
- The loss of assimilative capacity for future industry or development
- The loss of benefits associated with the current high water quality, i.e., uses such as fishing or tourism.

The new or expanded action would be allowed to measurably reduce the water quality only if it is demonstrated that the action has selected the combination of site, technical and managerial approaches that will minimize the effect on water quality. Alternative approaches that must be evaluated include:

- Pollution prevention or source control to reduce toxic compound discharges
- Reuse or recycling of wastewater
- Water conservation to minimize production of wastewater
- Land application or infiltration to reduce surface water discharges
- Alternative or enhanced treatment technologies
- Improved operation and maintenance of existing facilities
- Seasonal or controlled discharge to avoid critical water quality conditions
- Water quality offsets with another water quality action (point or non-point source), providing no net decrease of water quality.

Discharge Permits

The primary means for achieving the water quality standards of WAC 173-201A is the issuance of discharge permits, such as NPDES permits or State Waste Discharge permits, by the Department of Ecology.

When it is not possible to immediately achieve compliance with the standards in WAC 173-201A, Ecology may issue an order with a compliance schedule to allow for further water quality studies, implementation of best management practices or construction of necessary treatment capability. Compliance schedules may only be issued for existing discharges.

Assimilative capacity is a term that describes a surface water's ability to accept waste loadings without a permanent degradation of water quality. Ecology is presently conducting waste load capacity studies (also known as Total Maximum Daily Load, or TMDL, studies) for several major watersheds in the State of Washington. These studies will be utilized to determine the assimilative capacity of watersheds that are noted as "impaired" for having too high a temperature or having too high a concentration of a pollutant, such as BOD₅ or potentially toxic pollutants such as chlorine, ammonia, and metals. For example, the assimilative capacity of a surface water with respect to BOD₅ will be based on the mass of an oxygen-depleting substance (e.g., organic matter and ammonia) that can be discharged into a surface water without depleting dissolved oxygen to levels that would be detrimental to aquatic life.

The Federal Environmental Protection Agency, in consultation with Ecology, establishes and maintains a list of impaired water body segments, known as the 303(d) list. TMDL studies will generally be necessary to determine an allotted wasteload for any single discharger.

Discharging to surface water requires a National Pollutant Discharge Elimination System (NPDES) permit issue by Ecology under WAC 173-220. The minimum level of treatment required for discharge is called "All Known, Available and Reasonable Treatment" (AKART) and represents a technology based standard for treatment plant performance. Minimum discharge standards for activated sludge (secondary treatment)

facilities discharging to surface water, taken from WAC 173-221 are shown in Table 4-2. Secondary standards were developed for “conventional pollutants,” and do not establish AKART for toxic pollutants. Ammonia is a toxic pollutant, and therefore, not the subject of Chapter 173-220 WAC, but of Chapter 173-201A WAC.

TABLE 4-2

**Minimum WWTP Effluent Standards for Surface Water Discharge from a
Secondary Treatment Plant**

Parameter	Average Monthly	Average Weekly
5-day Biochemical Oxygen Demand (BOD ₅)	Most stringent of the following: 30 mg/L may not exceed 15 percent of the average influent concentration	45 mg/L
Total Suspended Solids (TSS)	Most stringent of the following: 30 mg/L may not exceed 15 percent of the average influent concentration	45 mg/L
Fecal Coliform Bacteria ⁽¹⁾	200/100 mL	400/100 mL
pH	Shall be within the range of 6.0 to 9.0	

(1) The averages for fecal coliform are based on the geometric mean of the samples taken.

Under RCW 90.48, Water Pollution Control, Ecology is authorized to condition NPDES permits so that the discharge meets water quality standards. Therefore, other permit conditions in addition to, or more stringent than the above, could be added to ensure that the water quality of the receiving water is not degraded. For example, an ammonia limit was added to Buckley’s NPDES permit to prevent degradation of the receiving water. Existing and proposed Buckley permit limits are discussed in Chapter 5 and Chapter 6 of this Plan and summarized in Table 6-8.

STATE ENVIRONMENTAL POLICY ACT

The WAC 173-240-050 requires a statement in all wastewater comprehensive plans that proposed projects are evaluated using the State Environmental Policy Act (SEPA), if applicable. The capital improvements proposed in this plan will fall under SEPA regulations. The City planning department has determined that this Plan does not warrant a SEPA determination.

GROWTH MANAGEMENT

The City of Buckley has conducted planning under the 1990 State Growth Management Act as embodied in the 2015 City of Buckley Comprehensive Plan. This planning is discussed in detail in Chapter 3 of this Plan.

ACCREDITATION OF ENVIRONMENTAL LABORATORIES (WAC 173-050)

The State of Washington requires that all laboratories reporting data to comply with NPDES and Solid Waste Disposal (SWD) permits must be generated by an accredited laboratory. This accreditation program establishes specific tasks for quality control and quality assurance (QA/QC) that are intended to ensure the integrity of laboratory procedures. Accreditation requirements must be met for any on-site laboratory or outside laboratory used to analyze samples. Only accredited commercial laboratories may be used for analyses reported for compliance with NPDES or SWD permits.

The City of Buckley currently has an accredited laboratory facility (capable of measuring pH, alkalinity and etc.), and rarely has to contract out other compliance related laboratory testing.

MINIMUM STANDARDS FOR SOLID WASTE HANDLING (WAC 173-304)

Grit and screenings are not subject to the sludge regulations in WAC 173-308, but their disposal is regulated under the State solid waste regulations, WAC 173-304. Waste placed in a municipal solid waste landfill must not contain free liquids, nor exhibit any of the criteria of a hazardous waste as defined by WAC 173-303. To be placed in a municipal solid waste landfill, grit and screenings must pass the paint filter test, which determines the amount of free liquids associated with the solids, and the toxic characteristics leachate procedure (TCLP) test, which determines if the waste has hazardous characteristics.

WETLANDS

Dredging and Filling Activities in Natural Wetlands (Section 404 of the Federal Water Pollution Control Act)

A U.S. Army Corps of Engineers permit is required when locating a structure, excavating, or discharging dredged or fill material in waters of the United States or transporting dredged material for the purpose of dumping it into ocean waters. Typical projects requiring these permits include the construction and maintenance of piers, wharves, dolphins, breakwaters, bulkheads, jetties, mooring buoys, and boat ramps.

If wetland fill activities cannot be avoided, negative impacts can be mitigated by creating new wetland habitat in upland areas, and if other federal agencies agree, the Corps will generally issue a permit.

Wetlands Executive Order 11990

This order directs Federal agencies to minimize degradation of wetlands and enhance and protect the natural and beneficial values of wetlands. The order also mandates avoidance and mitigation of impacts to wetlands, and must be considered before an NPDES permit

is issued. Assurances must be provided that the natural and beneficial values of wetlands will be protected and enhanced by the discharge.

SHORELINE MANAGEMENT ACT

The Shoreline Management Act of 1971 (RCW 90.58) establishes a broad policy giving preference to shoreline uses that protect water quality and the natural environment, depend on proximity to the water, and preserve or enhance public access to the water. Shoreline Management Act jurisdiction extends to lakes or reservoirs of 20 acres or greater, streams with a mean annual flow of 20 cubic feet per second (CFS) or greater, marine waters, and an area inland 200 feet from the ordinary high water mark. Projects are reviewed by local governments according to state guidelines and a local Shoreline Master Program.

Local Shoreline Master Programs are developed in accordance with guidelines from the Department of Ecology (Ecology). Although this rule does impose a varying level of scrutiny within the shoreline area, the purpose is to use “Best Available Science” as required by the Growth Management Act to ensure that regulations are substantively linked to the protection of shoreline functions and values.

The City of Buckley has completed its Shoreline Plan.

FLOODPLAIN DEVELOPMENT PERMIT

Local governments that are participating in the National Flood Insurance Program are required to review projects (including wastewater collection facilities) in a mapped flood plain and impose conditions to reduce potential flood damage from flood water. A Floodplain Development Permit is not required prior to construction.

HYDRAULIC PROJECT APPROVAL

Under the Washington State Hydraulic Code (WAC 220-110), the Washington State Department of Fish and Wildlife (WDFW) requires a hydraulic project approval (HPA) for activities that will “use, divert, obstruct, or change the natural flow or bed” of any waters of the state. For activities such as pipeline crossings of streams, an HPA will be required, and will include provisions necessary to minimize project specific and cumulative impacts to fish.

REGULATORY AGENCIES

The above regulations, permits, and programs are administered by various local, State, and Federal agencies. The history, purpose, and authority of these agencies are discussed below.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

The stated mission of the EPA is to protect human health and to safeguard the natural environment upon which life depends. The EPA's purpose includes protecting all Americans from significant human health risks and the environment, ensuring that national environmental efforts are based on the best available scientific information, ensuring that Federal laws are enforced fairly, and that environmental protection contributes to making our communities and ecosystems diverse, sustainable, and economically productive. Ecology currently administers NPDES permits, 401 Water Quality Certifications, and State Revolving Fund (SRF) loans for the EPA.

THE NATIONAL MARINE FISHERIES SERVICE

Under the ESA, NMFS is responsible for the protection of marine life, including anadromous salmon such as the Chinook. When a species is listed as "endangered," the prohibitions against "take" of the species are immediate under Section 9 of the ESA. Although NMFS may choose to invoke the blanket prohibitions of Section 9, the "threatened" status of the Chinook allows more flexibility to establish regulations designed to protect these species. These regulations, known collectively as a Section 4(d) rule, outline activities exempted from the "take" prohibitions of Section 9.

Table 4-3 shows the evolutionarily significant units (ESU) of salmon that use the White River for rearing and transport portions of their life cycles, according to the National Marine Fisheries Service, (from the NMFS Northwest Region webpage, 9/13).

TABLE 4-3

Evolutionarily Significant Units of Puget Sound Salmon

Species/ESU	Status	Date	FR Notice
Salmonids Under NMFS Jurisdiction:			
Puget Sound Chinook Salmon	Threatened Critical Habitat	6-28-05	70 FR 37160
Steelhead Trout	Threatened	9-02-05	70 FR 52630

UNITED STATES ARMY CORPS OF ENGINEERS

Under Section 404 of the CWA, the US Army Corps of Engineers (Corps) is authorized to regulate discharge of fill and dredged material to waters of the United States, including wetlands. The Corps employs a system of General or Nationwide Permits for blanket authorization of activities such as utility lines that have minimal adverse impact on the environment. In situations where adverse impact is probable, the Corps may issue an

Individual Permit after reviewing an analysis of alternatives. Enforcement actions may be taken by the Corps or EPA.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

The mission of Ecology's Water Quality Program is to protect, preserve, and enhance the state surface and ground water quality and to promote the wise management of water for the benefit of current and future generations. Ecology performs various functions under State and Federal authority and has both local and regional offices. Ecology is also responsible for awarding low interest loans for pollution control projects through the State Revolving Fund.

Ecology issues permits under the State Water Pollution Control Act, Section 401 Water Quality Certification, and NPDES permits in compliance with the CWA under EPA authority. Ecology also reviews and approves plans for on-site systems receiving State or Federal construction grants under the CWA. Ecology regulates discharge of waste to state groundwater, discharge of industrial or commercial waste to sewers, and the use of reclaimed water through the State Waste Discharge permit program. Local Ecology offices issue Temporary Modification of Water Quality Criteria Permits for construction near or in water that might cause short-term water quality violations.

Ecology also regulates the management and disposal of biosolids. The biosolids permit is a general permit that provides coverage for applicants that have conducted the required biosolids analysis. The City 2018 Biosolid Annual Report is included in Appendix I.

WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

Under WAC 220-110 and RCW 75.20, any form of work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water of the state requires hydraulic project approval from the Department of Fish and Wildlife. Approval would be required for all City construction projects that cross or otherwise take place in streams or shorelines.

STATE AND LOCAL HEALTH DEPARTMENTS

The Department of Health (Health) was formed in 1989 and is the primary state agency responsible for protecting public health. Health issues Waste Discharge Permits for reclaimed water use in conjunction with Ecology and approves onsite wastewater disposal systems between 3,500 and 100,000 GPD.

CITY AND COUNTY PLANNING POLICIES

The Washington Administrative Code (173-240-050) requires a statement in all Wastewater Comprehensive Plans regarding compliance with any adopted water quality management plan pursuant to the Federal Water Pollution Control Act as amended. The

City complies with the Federal Water Pollution Control Act by having an NPDES permit for the WWTP.

The Washington Administrative Code (173-240-050) requires a statement in all Wastewater Comprehensive Plans regarding compliance with the State Environmental Policy Act (SEPA), if applicable.

ON-SITE SEPTIC SYSTEM REGULATIONS

In some cases wastewater may be treated and disposed of on-site either by individual septic systems or community on-site systems. On-site septic systems should be designed to meet the Washington Department of Health Design Standards. Approval of the systems will be made either by the Pierce County Health Department for systems under 3,500 gallons per day, or the Washington State Department of Health for systems less than 100,000 gallons per day but greater than 3,500 gallons per day. The statute that provides the authority for the Department of Health (DOH) to regulate sewage systems is found in RCW 70.118B.

Septic systems that are currently active within City limits will be phased out as the wastewater collection system is expanded. Properties within county jurisdiction surrounding the City are primarily served by septic systems.

CITY SEWER ORDINANCES AND PLANNING POLICIES

Title 14 of the Buckley Municipal Code sets rules and regulations for the City's sewer system. The ordinance establishes rates and connection charges for City sewer customers. The City also has construction standards for developer constructed additions and connections to the City system.

The siting of any wastewater facilities such as pump stations or wastewater treatment facilities must comply with the City planning and zoning policies at the time of construction.

WATER RECLAMATION

Water reclamation is one way to improve water use efficiency by utilizing treated wastewater for some water supply needs. The water reclamation evaluation includes five elements:

1. Washington State requirements.
2. Identification of potential reclaimed water users.
3. Estimates of potable water savings if reclaimed water were available.

4. Financial feasibility of implementing reclaimed water projects.
5. Recommendations for implementing a reclaimed water program.

WATER RECLAMATION AND REUSE REQUIREMENTS IN WASHINGTON STATE

“Reclaimed water” is defined in RCW 90.46.010 as “effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur, and is no longer considered wastewater.”

In the State of Washington, any type of direct beneficial reuse of municipal wastewater is defined as water reuse or reclamation. The Departments of Health and Ecology have jointly issued *Water Reclamation and Reuse Standards*. This discussion is based on the current standards, which are adopted by reference in RCW Chapter 90.46, Reclaimed Water Use.

Washington State reuse standards are based on similar standards used throughout the United States. Washington’s reuse standards for municipal wastewater can be grouped into four categories:

- Treatment Standards
- Permitted Uses of Reclaimed Water
- Use Area Requirements
- Operational and Reliability Requirements

Washington’s reuse treatment standards call for *continuous* compliance, meaning that the treatment standard must be met on a constant basis or the treated water cannot be used as reclaimed water.

Treatment Standards

The State of Washington’s standards for municipal wastewater reuse have four classifications based on the type of treatment provided. The classifications are summarized below in Table 4-4.

TABLE 4-4**State of Washington Reclaimed Water Treatment Standards**

Reuse Class	Continuously Oxidized ⁽¹⁾	Continuously Coagulated ⁽²⁾	Continuously Filtered ⁽³⁾	Disinfection (Total Coliform Density) ⁽⁴⁾	
				7-Day Median Value	Single Sample
A	Yes	Yes	Yes	≤2.2/100ml	23/100ml
B	Yes	No	No	≤2.2/100ml	23/100ml
C	Yes	No	No	≤23/100ml	240/100ml
D	Yes	No	No	≤240/100ml	no standard

- (1) Oxidized wastewater is defined as wastewater in which organic matter has been stabilized such that the biochemical oxygen demand (BOD) does not exceed 30 mg/L and the total suspended solids (TSS) do not exceed 30 mg/L (monthly average basis), is non-putrescible (does not have a foul smell) and contains dissolved oxygen.
- (2) Coagulated wastewater is defined as an oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated prior to filtration by the addition of chemicals or an equally effective method.
- (3) Filtered wastewater is defined as an oxidized, coagulated wastewater that has been passed through natural undisturbed soils or filter media, such as sand or anthracite, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 nephelometric turbidity units (NTU), determined monthly, and does not exceed 5 NTU at any time.
- (4) Disinfection is a process which destroys pathogenic organisms by physical, chemical or biological means. The disinfection standards use coliform density as the measure of pathogen destruction. DOH recommends that a chlorine residual of 0.5 mg/L be maintained during conveyance from the reclamation plant to the use area to avoid biological growth in the pipeline and sprinkler heads.

Permitted Uses of Reclaimed Municipal Wastewater

Allowable water reuse methods within the State of Washington are presented in Table 4-6.

Most of the allowable reuse methods provide limited opportunity for reuse due to the relatively small quantities and seasonal nature of the reuse demand.

Two reuse methods that offer the potential for 100 percent reuse on a year-round basis are groundwater recharge and streamflow augmentation. A more detailed discussion of groundwater recharge and streamflow augmentation is provided after Table 4-5.

TABLE 4-5**Allowable Uses of Reclaimed Water**

Use	Class of Reclaimed Water Allowed			
	Class A	Class B	Class C	Class D
Irrigation of Non-Food Crops				
Trees and fodder, fiber, and seed crops	YES	YES	YES	YES
Sod, ornamental plants for commercial use, pasture to which milking cows or goats have access	YES	YES	YES	NO
Irrigation of Food Crops				
Spray Irrigation:				
All food crops	YES	NO	NO	NO
Food crops which undergo physical or chemical processing sufficient to destroy all pathogenic agents	YES	YES	YES	YES
Surface Irrigation:				
Food crops where there is no reclaimed water contact with edible portion of crop	YES	YES	NO	NO
Root crops	YES	NO	NO	NO
Orchards and vineyards	YES	YES	YES	YES
Food crops which undergo physical or chemical processing sufficient to destroy all pathogenic agents	YES	YES	YES	YES
Landscape Irrigation				
Restricted access areas (e.g., cemeteries, freeway landscaping)	YES	YES	YES	NO
Open access areas (e.g., golf courses, parks, playgrounds, etc.)	YES	NO	NO	NO
Impoundments				
Landscape impoundments	YES	YES	YES	NO
Restricted recreational impoundments	YES	YES	NO	NO
Non-restricted recreational impoundments	YES	NO	NO	NO
Fish Hatchery Basins	YES	YES	NO	NO
Decorative Fountains	YES	NO	NO	NO
Flushing of Sanitary Sewers	YES	YES	YES	YES

TABLE 4-5 – (continued)

Allowable Uses of Reclaimed Water

Use	Class of Reclaimed Water Allowed			
	Class A	Class B	Class C	Class D
Street Cleaning				
Street sweeping, brush dampening	YES	YES	YES	NO
Street washing, spray	YES	NO	NO	NO
Washing of Corporation Yards, Lots, and Sidewalks	YES	YES	NO	NO
Dust Control (Dampening Unpaved Roads, Other Surfaces)	YES	YES	YES	NO
Dampening of Soil for Compaction (Construction, Landfills, etc)	YES	YES	YES	NO
Water Jetting for Consolidation of Backfill Around Pipelines				
Pipelines for reclaimed water, sewage, storm drainage, gas, electrical	YES	YES	YES	NO
Fire Fighting and Protection				
Dumping from aircraft	YES	YES	YES	NO
Hydrants or sprinkler systems in buildings	YES	NO	NO	NO
Toilet and Urinal Flushing	YES	NO	NO	NO
Ship Ballast	YES	YES	YES	NO
Washing Aggregate and Making Concrete	YES	YES	YES	NO
Industrial Boiler Feed	YES	YES	YES	NO
Industrial Cooling				
Aerosols or other mist not created	YES	YES	YES	NO
Aerosols or other mist created (e.g., cooling towers, spraying)	YES	NO	NO	NO
Industrial Process				
With exposure of workers	YES	NO	NO	NO
Without exposure of workers	YES	YES	YES	NO

Groundwater Recharge

Groundwater recharge with reclaimed water is permitted under the water reuse standards. Three categories of groundwater recharge are covered in the water reuse standards:

1. Direct Injection to a Drinking Water Aquifer,
2. Direct Injection to a Non-Drinking Water Aquifer, and
3. Surface Percolation.

Direct Injection to a Drinking Water Aquifer

Direct injection of reclaimed water to a drinking water aquifer must meet the water quality standards for primary contaminants (except nitrate), secondary contaminants, radionuclides and carcinogens contained in Table 1 of WAC 173-200, as well as maximum contaminant levels (MCLs) contained in the State Drinking Water Standards, WAC 246-290.

Additionally, for direct injection to a drinking water aquifer, preinjection treatment must include the following:

1. reverse osmosis treatment
2. turbidity ≤ 0.1 NTU (average) and ≤ 0.5 NTU (maximum)
3. total organic carbon levels ≤ 1.0 mg/L
4. total nitrogen ≤ 10 mg/L as N

Direct Injection to a Non-Drinking Water Aquifer

Direct injection of reclaimed water to a non-drinking water aquifer must meet Class A reclaimed water treatment standards as well as the following additional criteria:

1. $BOD_5 \leq 5$ mg/L
2. $TSS \leq 5$ mg/L
3. any additional criteria deemed necessary by DOH or Ecology

Surface Percolation

Groundwater recharge using surface percolation requires at least Class A reclaimed water unless a lesser level is allowed under a pilot project status by DOH and Ecology. In addition to secondary treatment to provide oxidized wastewater, the process must include a “step to reduce nitrogen prior to final discharge to groundwater.”

Streamflow Augmentation

For small streams where fish habitat has been degraded due to low instream flows, streamflow augmentation is an option allowed under the water reuse regulations and

standards. This reuse method requires an NPDES permit and adherence to the Surface Water Quality Standards (WAC 173-201A). However, the key difference between streamflow augmentation and surface water disposal is that a determination of beneficial use has been established based on a need to increase flows to the stream. To make this determination requires concurrence from the Washington State Department of Fish and Wildlife that the need exists for additional instream flows.

Other Uses

The water reuse standards allow for other uses that are not discussed in detail in this Chapter. However, the general basis for the reuse criteria is that when unlimited public access to the reclaimed water is involved the criteria will require Class A reclaimed water. Essentially, for a water reclamation project to have the flexibility to allow for relatively unrestricted use, the reclaimed water should meet the Class A reuse standard.

Use Area Requirements

The water reuse standards establish criteria for siting and identifying water reclamation projects and their facilities. Water reclamation storage facilities, valves, and piping must be clearly color-coded and labeled and no cross-connections between potable water and reclaimed waterlines are allowed. The potable water system manager must have an approved cross-connection control program pursuant to WAC 246-290-490.

Maximum attainable separation between reclaimed water lines and potable waterlines must be achieved. A minimum horizontal separation of 10 feet is required for buried lines, but when crossing is necessary, a minimum 18-inch vertical separation is required and the potable waterline must be above the reclaimed waterline.

Reclaimed water may be used to flush toilets in condominiums and apartment complexes as long as residents do not have access to plumbing systems for repairs or modifications.

Another key requirement for a water reclamation project is setback distance. Table 4-6 summarizes setback requirements for water reclamation facilities. In general, setback distances are minimized with higher levels of treatment and reliability. Class A reclaimed water requires no buffer between irrigated areas and public use areas.

TABLE 4-6**Setback Distances for Reclaimed Water in the State of Washington**

Reclaimed Water Use/Facility	Distance (Feet)			
	Class A	Class B	Class C	Class D
Minimum Distance to Potable Water Well:				
Spray or Surface Irrigation	50	50	100	300
Unlined Storage Pond or Impoundment	500	500	500	1,000
Lined Storage Pond or Impoundment	100	100	100	200
Pipeline	50	100	100	300
Minimum Distance from Irrigation Areas to Public Areas	0	50	50	100

Operational and Reliability Requirements

Under the reuse standards, there are a number of operational and reliability requirements for a water reclamation plant. Several key requirements are summarized below.

- Minimum Class III Operator.
- Critical equipment and process failures must be signaled by an alarm.
- Emergency storage and disposal facilities in the event of equipment failure or the intermittent production of effluent that does not meet the reclaimed water standards.
- Operating records provided to DOH as well as Department of Ecology.
- No bypass of untreated or partially treated water.
- Either a standby power supply or long-term disposal or storage facilities for untreated wastewater.

POTENTIAL RECLAIMED WATER USERS**Large Water System Users**

The largest individual water user in the City is Rainier School, and the second largest user is WSU Agricultural Facility. The City has no commercial or industrial users that use large amounts of water. Therefore, the greatest potential for water reuse would be by Rainier School or WSU Agricultural Facility. Rainier School water use is essentially potable water supply for residents of the facility, and it is unlikely that Rainier School would accept using reclaimed water for potable water supply. The WSU Agricultural Facility water use is for agricultural purposes. There may be a possibility that WSU

Agricultural Facility would be interested in using reclaimed water at the Buckley facility. To use reclaimed water at the WSU Agricultural Facility would require treatment to Class A Reclaimed Water Standards and construction of reclaimed water transmission piping. There is an existing dry line extending from River Road to the WSU Agricultural Facility that could possibly be used to transmit reclaimed water to the WSU site.

Parks and Recreational Areas

The City of Buckley has a middle school with athletic fields located inside the City limits that would be considered irrigable property. To irrigate the high fields with reclaimed water would require treatment to Class A Reclaimed Water Standards, and construction of approximately 0.7 miles of reclaimed water transmission piping to the football field, and an additional approximately 0.4 miles of reclaimed water transmission piping to other athletic fields. If reclaimed water were to be piped to the WSU Agricultural Facility, as discussed above, the pipeline route would most likely pass by the High School football field, requiring an additional approximately 300 feet of reclaimed water transmission piping to irrigate the football field, but would still require the additional approximately 0.4 mile of reclaimed water transmission piping to irrigate the other high school fields.

Flushing of Sanitary Sewers

The City of Buckley wastewater collection system could utilize Class D reclaimed water to flush wastewater collection piping.

Use at Wastewater Treatment Plant

The City of Buckley utilizes Class D Reclaimed Wastewater for wash at the WWTP.

FEASIBILITY OF WASTEWATER REUSE

The City of Buckley has adequate water resources for the foreseeable future and limited potential for wastewater reuse at this time. The City will continue using reclaimed wastewater for wash down and irrigation at the wastewater treatment plant, and will consider using reclaimed wastewater for sewer jetting and cleaning, but construction of additional treatment, storage, and distribution facilities for wider use of reclaimed wastewater will need to be further evaluated. The City plans to conduct a Reuse Feasibility Study and the study in the Capital Improvement Plan in Chapter 7.

RECOMMENDATIONS FOR WASTEWATER RECLAMATION

It is recommended that the City of Buckley continue using Class D Reclaimed water for wash down and landscape irrigation at the wastewater treatment plant, and consider using Class D Reclaimed water for sewer jetting. Consideration of upgrades of the wastewater treatment plant to produce higher classes of reclaimed water and installation of storage and piping system necessary for greater reuse of reclaimed wastewater will be made as part of the City's planned study.

CHAPTER 5

EXISTING COLLECTION SYSTEM

INTRODUCTION

The City of Buckley owns and operates a wastewater collection system and treatment plant. The sewer collection system for the City was originally built in the early 1930's as a combined storm and sanitary sewer system. Over the years, extensions and sewer separations have occurred resulting in gravity sewers, force mains and manholes essentially divided into two separate systems on either side of SR 410. The older gravity sewer mains consist of clay pipes with mortared bell-spigot type joints. More recent construction is primarily 8- and 10-inch concrete and PVC pipe with rubber joints. However, less than 1/3 of the system has been installed with this type of construction.

Buckley's wastewater treatment plant was originally constructed in 1952 with a design flow of 300,000 gallons per day. The plant was upgraded in 1980 to achieve secondary treatment, and again in 2008 to the present facility to increase the treatment capacity. The current wastewater treatment plant uses an oxidation ditch and secondary treatment with for an instantaneous peak flow of 2.7 MGD, peak daily flow of 1.65 MGD, and monthly average flow (max. month) of 1.0 MGD (See Appendix A, Fact Sheet dated May 5, 2003, Page 5). The plant site is located adjacent to White River, which is the lowest point of the community. The plant's mechanical components and tankage are located above the 100-year flood plain.

EXISTING WASTEWATER COLLECTION SYSTEM

A network of gravity sewers and force mains serve the City of Buckley. Most of the older collection system is located within the downtown corridor, where the historic part of the City is situated. These sewers were constructed in the 1930's to serve only the then-developed portions of the city and were not sized to be large enough to accommodate the future growth areas now being planned.

Most of the City's new growth has been in areas outside of the historic downtown part of the City. The developed areas have collections systems that discharge to lower drainage basins, which relay and lead to the wastewater treatment plant. The discharges from the growth served by these systems are beginning to consume the remaining capacity of the older gravity collection system.

In all, the City maintains approximately 123,500 lineal feet of gravity sewer and 10,600 lineal feet of force main. In Chapter 3, Figure 3-1 presented the area served by the existing sewer system. The existing sewer system is provided in Chapter 2, Figure 2-1. Table 5-1 provides an inventory of the gravity sewer in the system.

TABLE 5-1**Inventory of Gravity and Force Mains**

Description	Size (in)	Length (LF)
Force Main Sewer	4	2,700
	6	5,100
Gravity Sewer	4	24,000
	6	2,100
	8	60,300
	10	12,000
	12	9,100
	14	2,000
	15	2,100
	18	6,200

One key consideration for the City is the capacity and condition of the collection system trunk lines, and the ability to adequately sustain future growth demands. A capacity analysis of the sewer system was performed. The results of this analysis are presented in Chapter 7 and in Appendix C. The analysis indicates that the existing system can withstand peak conditions throughout the current system. One exception exists, as a single section of pipe on South 3rd Street between West Mason Avenue and Wheeler Avenue nears capacity at peak conditions. Upstream Manhole B3 to downstream Manhole B2 reaches 94 percent capacity at peak conditions. The capacity issue originates from a lack of slope between the manholes. City crews have not experienced difficulty with this segment. It should be monitored in the future via periodic visual inspections, as flows from the southeastern portion of the City increase.

EXISTING LIFT STATIONS AND FORCE MAINS

White River School District owns/operates two sanitary sewer lift stations, while the City owns/operates the common force main, further described below. Future sewer extensions may require that additional lift stations and force mains come on line to service the population.

West 410 Force Main (Serving the commercial district in the southwest corner of City Limits as shown in Figure 2-1)

The West 410 Force Main is located along the south side of SR 410 and runs from Mundy Loss Road to east of Chamberlain Way. The West 410 Force Main conveys wastewater from various commercial developments within the Buckley commercial

district in the western area of City. The City maintains the 5,100 LF 6-inch PVC West 410 Force Main portion within City limits. The connecting force main beyond City limits is 3,600 LF 4-inch PVC and is supplied by two adjacent sewer pump stations, which are owned and operated by the White River School District and serve Mountain Meadows Elementary School and a second school currently used for alternative programs. The capacity of this system could be increased on an interim basis if larger pumps were installed or flow equalization was provided to dampen peak flows. The sewer bills for the two schools is based on the water consumption. The two sewer pump stations are outside the City limits and the City does not have current plans to take ownership and operation of the stations. The City communicates with the School District maintenance staff to identify any problems with the operation of the pump stations that may impact the City system.

A new sewer pump station was installed in 2019 at the Spiketon Road Plat (aka White River Meadows). The pump station is identified as Project L-1 on Figure 7-4. The pump station currently serves the lots in the plat, but has capacity to serve the future basin TAN-W, as described in Chapter 7.

Planned future pump stations on Hinkleman Road and on 112th Street in the Pressure Zone (PZ) basin are identified in Chapter 7 and are intended to serve multi-family residential development within the basin, should such development occur. The existing force main along SR-410 has capacity to serve most commercial and industrial land uses that tend to use minimal water and thus produce minimal wastewater, on a gallons per acre per day basis. However, the zoning in the PZ basin of “Neighborhood Mixed Use” (see Figure 3-1), allows for multi-family residential, and additional sewer pump stations and associated force mains would be required to provide sanitary sewer service in this basin.

SEWER SYSTEM CONNECTIONS

The City sewer system currently serves approximately 1,550 residential sewer connections and 153 commercial connections. The commercial connections consist of schools, warehouse facilities, light industrial facilities, restaurants, stores, and offices. The wastewater from the non-residential sources consists mostly of toilet and food preparation flows. None of the commercial flows represent an unusual waste stream.

CHAPTER 6

EXISTING AND PROJECTED WASTEWATER FLOWS AND CHARACTERISTICS

INTRODUCTION

Adequate design of wastewater treatment and conveyance facilities requires the determination of the quantity and quality of wastewater generated from each of the contributing sources. Buckley wastewater is predominantly domestic in origin with lesser amounts contributed by commercial and industrial businesses and by public use facilities such as schools, parks, and municipal functions. Infiltration and inflow contributions result from groundwater and surface water entering the sewer system during periods of high groundwater levels and rainfall, respectively.

DEFINITION OF TERMS

In this Chapter, the existing wastewater characteristics for the service area will be analyzed and projections made for future conditions. The terms and abbreviations used in the analysis are described below.

WASTEWATER

Wastewater is water-carried waste from residential, business and public use facilities, together with quantities of groundwater and surface water which enter the sewer system through defective piping and direct surface water inlets. The total wastewater flow is quantitatively expressed in millions of gallons per day (mgd) or gallons per day (gpd).

DOMESTIC WASTEWATER

Domestic Wastewater is wastewater generated from single and multi-family residences, permanent mobile home courts, and group housing facilities such as nursing homes. Domestic wastewater flow is generally expressed as a unit flow based on the average contribution from each person per day. The unit quantity is expressed in terms of gallons per capita per day (gpcd).

EQUIVALENT DWELLING UNIT (EDU)

A baseline wastewater contributor that represents the average single-family residential household. An EDU can also express the average annual flow contributed by a single-family household, in units of gallons per day. The City's 2003 Comprehensive

Sewer Plan identifies a residential EDU as equivalent to 2.6 residents. The EDU flow is established at 265 gallons per day (gpd).

INFILTRATION

Infiltration is groundwater entering a sewer system by means of defective pipes, pipe joints, or manhole walls. Infiltration quantities exhibit seasonal variation in response to groundwater levels. Storm events can trigger a rise in the groundwater levels and increase infiltration flows. The highest infiltration flows are observed following significant storm events or following prolonged periods of precipitation. Since infiltration is related to the total amount of piping and appurtenances in the ground and not to any specific water use component, it is generally expressed in terms of the total land area being served. The unit quantity generally used is gallons per acre per day (gpac).

INFLOW

Inflow is surface water entering the sewer system from yard, roof, and footing drains, from cross connections with storm drains and through holes in manhole covers. Peak inflow occurs during heavy storm events when storm sewer systems are taxed beyond their capacity, resulting in hydraulic backups and local ponding. Inflow, like infiltration, is generally expressed in terms of gallons per acre per day (gpac).

AVERAGE DRY WEATHER FLOW

Average Dry Weather Flow (ADWF) is wastewater flow during periods when the groundwater table is low and precipitation is at its lowest of the year. The dry weather flow period in western Washington normally occurs from June through September. During this time, the wastewater strength is highest, due to the lack of dilution by the ground and surface water components of infiltration and inflow (I/I). The higher strength coupled with higher temperatures and longer detention times in the sewer system create the greatest potential for odors during this time. The average dry weather flow is the average daily flow during the three lowest consecutive flow months of the year. For this study, average flows for June, July, and August were used for determining the Average Dry Weather Flow. The unit quantity is expressed in either mgd or gpd.

AVERAGE ANNUAL FLOW

Average Annual Flow (AAF) is the average daily flow over a calendar year. This flow parameter is used to estimate annual operation and maintenance costs for treatment and pump station facilities. The unit quantity is expressed in either mgd or gpd.

MAXIMUM MONTHLY FLOW (TREATMENT DESIGN FLOW)

Maximum Monthly Flow (MMF) is the average daily flow during the highest flow month of the year. This wintertime flow is composed of the normal domestic, commercial and public use flows with significant contributions from inflow and infiltration. The predicted maximum monthly flow at the end of the design period is used as the design flow for sizing treatment processes and selecting treatment equipment. The unit quantity is expressed in either mgd or gpd.

PEAK DAY FLOW

Peak Day Flow (PDF) is the highest flow occurring during a one day period in a calendar year. In western Washington, the peak day flow occurs in the winter due to the presence of more infiltration and inflow (I/I). This wintertime flow is composed of the normal domestic, commercial and public use flows with significant contributions from inflow and infiltration. The peak day flow at the end of the design period is used to design some wastewater treatment processes. The unit quantity is expressed in either mgd or gpd.

PEAK HOUR FLOW

Peak Hour Flow (PHF) is the maximum expected peak hourly flow, which typically occurs during a wet weather day. The peak hour flow occurs in response to a significant storm event preceded by prolonged periods of rainfall, which have previously developed a high groundwater table in the service area. Peak hourly flows are used in sizing the hydraulic capacity of wastewater collection, treatment and pumping components. The unit quantity is expressed in gallons per hour (gph).

COMMERCIAL AND INDUSTRIAL WASTEWATER

Commercial and Industrial Wastewater is non-residential wastewater generated from business activities, such as restaurants, retail and wholesale stores, service stations, and office buildings. In addition, as noted in Chapter 3, the City is anticipating significant future commercial growth. Commercial and industrial wastewater quantities are expressed in this Plan as equivalent dwelling units (EDUs) at 265 gpd/EDU. Future non-residential wastewater quantities are projected based on the number of retail and non-retail employees as projected in the 2005 Capital Facilities Plan. Maximum month flow per retail employee is estimated to be 100 gallons per day. The maximum month flow per non-retail employee is estimated to be 20 gallons per day. Baseline (current) non-residential flow has been determined based on the proportion of wintertime metered water use by non-residential customers.

BIOCHEMICAL OXYGEN DEMAND (BOD)

Biochemical Oxygen Demand (BOD) is a measure of the oxygen required by microorganisms in the biochemical oxidation of organic matter. BOD is an indicator of the organic strength of the wastewater. If BOD is discharged untreated to the environment, biodegradable organics will deplete natural oxygen resources and result in the development of septic conditions. BOD data together with other parameters are used in the sizing of the treatment facilities and provide a measurement for determining the effectiveness of the treatment process. BOD is expressed as a concentration in terms of milligrams per liter (mg/L) and as a mass load in terms of pounds per day (lb/day). The term BOD typically refers to a test conducted over a 5-day period, often written as BOD₅.

SUSPENDED SOLIDS

Suspended Solids is the solid matter carried in the waste stream. Suspended solids are expressed in the same terms as BOD; milligrams per liter (mg/L) for concentration and pounds per day (lb/day) for mass load. The amount of suspended solids in the wastewater is used in the sizing of treatment facilities and provides another measure of the treatment effectiveness. The concentration of total suspended solids (TSS) in wastewater affects the treatment plant sludge production rate and ultimate disposal requirements.

OTHER CONTAMINANTS OF CONCERN

Other contaminants of concern in wastewater include nutrients such as nitrogen and phosphorous, ammonia, priority pollutants, heavy metals and dissolved organics. Secondary treatment standards are concerned with the removal of biodegradable organics, suspended solids, and pathogens. Many of the more stringent water quality and biosolids standards that have been developed recently deal with the removal of nutrients, metals, and priority pollutants.

Nutrients such as nitrogen and phosphorus, along with carbon, are essential requirements for growth. When discharged to the aquatic environment, these nutrients can lead to the growth of undesirable aquatic life. When discharged in excessive amounts on land, they can also lead to the pollution of groundwater. The ammonia form of nitrogen can exert an oxygen demand and is toxic to aquatic life.

Priority pollutants are organic and inorganic compounds selected on the basis of their known or suspected carcinogenicity, mutagenicity, teratogenicity, or high acute toxicity. Many of these compounds are found in wastewater.

Heavy metals usually result from commercial and industrial discharges and may result in violations of water quality standards or biosolids standards. Inorganic constituents such as calcium, sodium, and sulfate are added to the original domestic water supply as a result of water use and may have to be removed if the wastewater is reused.

EXISTING WASTEWATER SERVICE POPULATION, FLOWS AND LOADINGS

Wastewater treatment plant (WWTP) records for the period from May 2009 through December 2018 were reviewed and analyzed to determine wastewater characteristics and influent loadings. These wastewater flows and loadings were then used in conjunction with projected population data to help determine projected future wastewater flows and loadings. Monthly discharge monitoring report (DMR) data for this period are summarized in Appendix B. Appendix B provides monthly plant flow, BOD₅, and TSS data for the period from May 2009 to December 2018. Graphical representations of the influent values in for average monthly WWTP flows, BOD₅ loading, and TSS loading from this period are shown in Appendix B.

EXISTING WATER SERVICE POPULATION

The existing and historic census population data are presented in Table 3-2. For year 2014, the wastewater service population is estimated to be 4,065 or 91 percent of the total population.

EXISTING FLOWS

Wastewater Flows at WWTP

The information in Appendix B shows that monthly WWTP flows ranged from 0.269 mgd to 1.399 mgd during the 120-month period of analysis.

The average dry weather flow for May 2009-April 2019 was 0.410 mgd. With an average residential population of 4,065 during this time period, this translates to a dry weather per capita flow of 108 gal/cap/day (gpcd) and 280 gal/EDU/day, based on 2.6 persons per EDU.

The average annual flow for the 10-year period from May 2009 to April 2019 was measured at 0.658 mgd. The maximum monthly flow of 1.399 mgd occurred in December of 2015.

TABLE 6-1**WWTP Flows**

Flow Type	Flow Rate (mgd)
Average Dry Weather Flow ⁽¹⁾	0.410
Average Wet Weather Flow ⁽²⁾	0.881
Annual Average Flow	0.658
Maximum Month Flow	1.399

(1) Dry weather months include June, July, and August.

(2) Wet weather months include December, January, and February.

Infiltration and Inflow

The U.S. EPA manual entitled *I/I Analysis and Project Certification* provides guidelines on how to determine if infiltration and/or inflow are excessive. The manual states that if the highest average daily flow recorded over a period of seasonal high groundwater without precipitation is greater than 120 gpcd, then further studies must be conducted to quantify excessive infiltration and evaluate corrective measures. Table 6-3 includes information on the historical I/I in the City system.

TABLE 6-2**Infiltration and Inflow**

	Average Monthly Flow (mgd)					
Month	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
Jan	0.940	0.722	0.937	1.010	0.641	1.164
Feb	1.020	0.690	0.892	1.025	1.182	0.949
Mar	0.722	0.837	0.900	0.931	1.267	0.610
Apr	0.617	1.016	0.834	0.401	0.826	0.916
May	0.796	1.250	0.803	0.323	0.737	0.410
Jun	0.905	0.896	0.549	0.389	0.439	0.334
Jul	0.834	0.594	0.370	0.336	0.297	0.298
Aug	0.744	0.510	0.357	0.296	0.306	0.306
Sep	0.763	0.484	0.338	0.326	0.318	0.353
Oct	0.728	0.358	0.320	0.738	0.688	0.427
Nov	0.890	0.342	0.346	1.251	0.880	1.114
Dec	0.596	0.589	0.509	1.399	0.815	0.994

TABLE 6-2 – (continued)**Infiltration and Inflow**

Month	Average Monthly Flow (mgd)					
	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018
Total	9.555	8.288	7.155	8.425	8.395	7.875
High	1.020	1.250	0.937	1.399	1.267	1.164
Low	0.596	0.342	0.320	0.296	0.297	0.298
Average	0.796	0.691	0.596	0.702	0.700	0.656
I/I (High - Low)	0.424	0.908	0.617	1.103	0.970	0.866
Population (1)	5,520	5,580	5,590	5,700	5,856	6,018
I/I (gpcd)	77	163	110	194	166	144

(1) Population is equivalent population to include non-residential and Rainier School.

Because the data includes rainfall, a direct comparison of the 120 gpcd is not available. The high month flows in Table 6-3 include rainfall. The I/I reports submitted to Ecology include the monthly rainfall information and are included in Appendix B. Because the I/I in the City system is significant, the City of Buckley has an ongoing I/I reduction program, which includes the following:

- Maintenance of storm drains;
- Repairing leaks in sewers, manholes and pumping stations;
- Replacing leaking manhole covers;
- Monitoring wastewater flows throughout the collection system;
- Performing quality assurance inspections on sewer pipe installed in the new City developments; and
- Communication with Rainier School regarding I/I reduction within their sewer collection system.

PROJECTED WASTEWATER FLOWS

INTRODUCTION

Projected wastewater flows and loadings have been developed through 2035.

Projected Population and EDUs

Table 6-3 shows projected population and EDUs for low and high growth rate scenarios through 2035. These projections have been developed based on population projections and EDU estimates from the following documents:

- *2015 City of Buckley Comprehensive Plan.*
- *Pierce County Ordinance 2011-36s*

The projections shown in Table 6-3 are based on the following assumptions:

High Growth Rate Scenario:

- The number of residential EDUs is determined based on population divided by 2.6 people per EDU.
- 2017 population is taken from the 2015 Comprehensive Plan.
- Intermediate population estimates are based on interpolation between the historic population of 4,145 (2000) and projected population of 7,250 (2017).
- Population between 2014 and 2035 is determined by applying a uniform annual growth rate of 3.34 percent in accordance with the extrapolated growth rate from the 2015 Comprehensive Plan.

Moderate Growth Rate Scenario:

- Populations between 2014 and 2030 are determined as the sum of the 2013 population with an applied uniform annual growth rate of 2.76 percent in accordance with Table 3-3.
- Populations between 2031 and 2035 are determined as the sum of the 2030 population with an applied uniform annual growth rate of 2.88 percent in accordance with Table 3-3.
- The number of residential EDUs is determined based on population divided by 2.6 people per EDU.

Low Growth Rate Scenario:

- Populations between 2014 and 2035 are determined as the sum of the 2013 population with an applied uniform annual growth rate of 0.95 percent in accordance with Table 3-3.
- The number of residential EDUs is determined based on population divided by 2.6 people per EDU.

- Intermediate population estimates are based on interpolation of the current population and the historic annual growth rate of 0.95 percent.

TABLE 6-3

Projected Population and EDUs for Various Growth Scenarios

Year	Low Growth		Moderate Growth		High Growth	
	Population	EDUs	Population	EDUs	Population	EDUs
2013	4370	1681	4370	1681	4370	1681
2014	4412	1697	4491	1727	4516	1737
2015	4453	1713	4615	1775	4667	1795
2016	4496	1729	4742	1824	4823	1855
2017	4538	1746	4873	1874	4984	1917
2018	4582	1762	5007	1926	5150	1981
2019	4625	1779	5145	1979	5322	2047
2020	4669	1796	5287	2034	5500	2115
2021	4713	1813	5433	2090	5684	2186
2022	4758	1830	5583	2147	5874	2259
2023	4803	1847	5737	2207	6070	2334
2024	4849	1865	5896	2268	6272	2412
2025	4895	1883	6059	2330	6482	2493
2026	4942	1901	6226	2395	6698	2576
2027	4988	1919	6398	2461	6922	2662
2028	5036	1937	6574	2529	7153	2751
2029	5084	1955	6756	2598	7392	2843
2030	5132	1974	6942	2670	7639	2938
2031	5181	1993	7142	2747	7894	3036
2032	5230	2012	7348	2826	8158	3138
2033	5280	2031	7559	2907	8430	3242
2034	5330	2050	7777	2991	8712	3351
2035	5380	2069	8001	3077	9003	3463

Projected Flows

Projected maximum month and average daily wastewater flows are developed from the population and EDU projections in Table 6-3.

The future annual average flows are projected by multiplying the projected maximum month flows by the current (2013) annual average to maximum month flow ratio of 0.67:1.

The peak day flows are projected by using a weighted peak day flow to annual average flow peaking factor. This weighted peaking factor uses the current peak day to annual average flow ratio of 3.49:1 for the current population to projected population ratio and uses a projected future peak day to annual average ratio of 2.0:1 for the new population to projected population ratio. This approach assumes that the peak day per capita I/I component from new sources will be less than that of existing sources because new sewer construction materials and methods will allow less I/I than the existing sewers. The peak day to annual average flow ratio of 2.0:1 is based on data from various cities in Western Washington. The equation for calculating the projected peak day flow is given below:

$$PDF = AAF * 3.49 * \left(\frac{\text{Current Population}}{\text{Projected Total Population}} \right) + AAF * 2.0 * \left(1 - \frac{\text{Current Population}}{\text{Projected Total Population}} \right)$$

Where PDF = Peak Day Flow and AAF = Annual Average Flow.

The above equation can be rearranged to give the weighted hourly peaking factor:

$$PDF = AAF * PF_{PD}$$

Where PF_{PD} = Weighted (peak day) peaking factor =

$$3.49 * \left(\frac{\text{Current Population}}{\text{Projected Total Population}} \right) + 2.0 * \left(1 - \frac{\text{Current Population}}{\text{Projected Total Population}} \right)$$

The current and future peak hour flows are projected by multiplying the annual average flow by a population-based peaking factor, given by the equation:

$$PF = (18 + \sqrt{P}) / (4 + \sqrt{P})$$

where P = population, in thousands of people (Department of Ecology *Criteria for Sewage Works Design*, 1998).[√]

A summary of existing and projected flows and peaking factors is given below in Table 6-4. Existing flows have been determined from the discharge monitoring reports for the year 2013. Based on the 2013 maximum month flow and the current number of residential sewer connections, the 2013 maximum month EDU value was 362 gal/EDU/day.

TABLE 6-4**Existing and Projected Flows and Peaking Factors (High Growth Rate Scenario)**

Parameter	Year				
	2013⁽³⁾	2019	2024	2030	2034
New EDUs	⁽¹⁾	435	812	1,257	1,782
Total EDUs	1,681	2,115	2,493	2,938	3,463
Total Residential Population	4,370	5,500	6,482	7,639	9,003
Annual Average Flow, mgd	0.61	0.72	0.82	0.93	1.07
Max Month Flow, mgd	0.91	1.07	1.22	1.39	1.60
Daily Peaking Factor	3.49	3.18	3.00	2.85	2.72
Peak Day Flow, mgd	2.12	2.29	2.46	2.66	2.92
Hourly Peaking Factor ⁽²⁾	3.3	3.2	3.1	3.1	3.0
Peak Hour Flow, mgd	2.00	2.31	2.57	2.87	3.21

- (1) In 2013 it was estimated that the City served 1,681 EDUs. The flow per EDU for 2013 was calculated at 362 gal/EDU.
- (2) The hourly peaking factor for 2013 onward was estimated according to Section C1-3.3.2 of the Ecology publication *Criteria for Sewage Works Design*.
- (3) The 2013 flows are based on the discharge monitoring reports for the year 2013.

CHAPTER 7

WASTEWATER COLLECTION SYSTEM EVALUATION

INTRODUCTION

The purpose of this chapter is to identify and provide cost estimates for those improvements to the City of Buckley wastewater collection system that will be required to remain in regulatory compliance and accommodate growth projections within the City limits. Recommendations for improvements in collection system management in order to protect the investment in the collection system are also provided.

The City of Buckley plans to update Development Guidelines and Public Works Standards in the first quarter of 2020 to ensure that the following issues are addressed:

- Odor and hydrogen sulfide control, using a system that the City can operate cost effectively.
- Construction quality control to ensure that the new system elements are not a source of infiltration and inflow.
- A requirement that utilizes grinder pumps rather than STEP systems when needed for individual property service.

City code (BMC 14.08.010) includes requirements for septic systems to connect to the City sewer system. The City's intent is to facilitate such connections, as reasonable and as allowed by code requirements. Construction of new gravity or pressure sewers within City rights-of-way adjacent to properties on septic are intended to include stubs to the property lines to facilitate the future connections to the City sewer system.

EXISTING COLLECTION SYSTEM ISSUES

The existing collection system was described in Chapter 5. Chapter 6 provided an analysis of the infiltration and inflow for the existing collection system. Significant conclusions from these two previous chapters are summarized in the following paragraphs.

Much of the existing collection system in the historic downtown area was constructed of concrete pipe in the 1930s. In general, this part of the collection system is in good condition. The system becomes limited on the west side of SR 410 until the approach of the WWTP at STP Road. Inflow from the east is limited to an estimated capacity of 2.13 mgd along Park Avenue (14-inch pipeline), and inflow from the south is limited to an estimated capacity of 1.30 mgd along 2nd Street (12-inch pipeline). Future developments brought on line in the southeastern portion of the City limits should be

directed immediately north when possible. The eastern inflow, Park Avenue pipeline, can withstand projected future loadings which includes the proposed southeastern drainage basins. The southern, 2nd Street pipeline, reaches a 91 percent capacity at projected future loadings, which is beyond the planning level threshold without the proposed southeastern drainage basin loadings.

The downtown collection system does not exhibit excessive infiltration and inflow as defined by USEPA guidelines. This non-excessive I/I is due to the City's ongoing I/I reduction program, which includes maintenance of storm drains; removal of roof drains from sanitary sewers; repairing leaks in sewers, manholes and pumping stations; smoke testing and televising sewers; replacing leaking manhole covers; and monitoring sewage flows throughout the system. Evaluation of historic video records tapes of the system indicates that there is some root penetration and grease buildup within the downtown sewers. The problems identified do not appear to require a capital expenditure. However, additional attention should be directed to collection system cleaning. A pretreatment ordinance is also included in the City's code to strengthen control of fats, oils, and grease (FOG) discharges into the collection system. The City code for Sewer Use Regulations, including control of FOG is included in Appendix E.

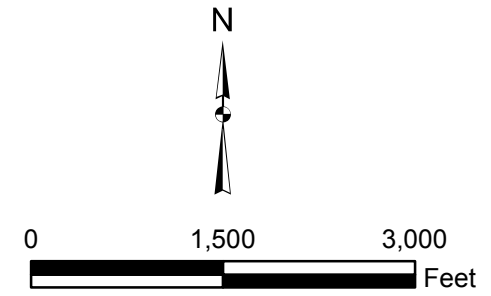
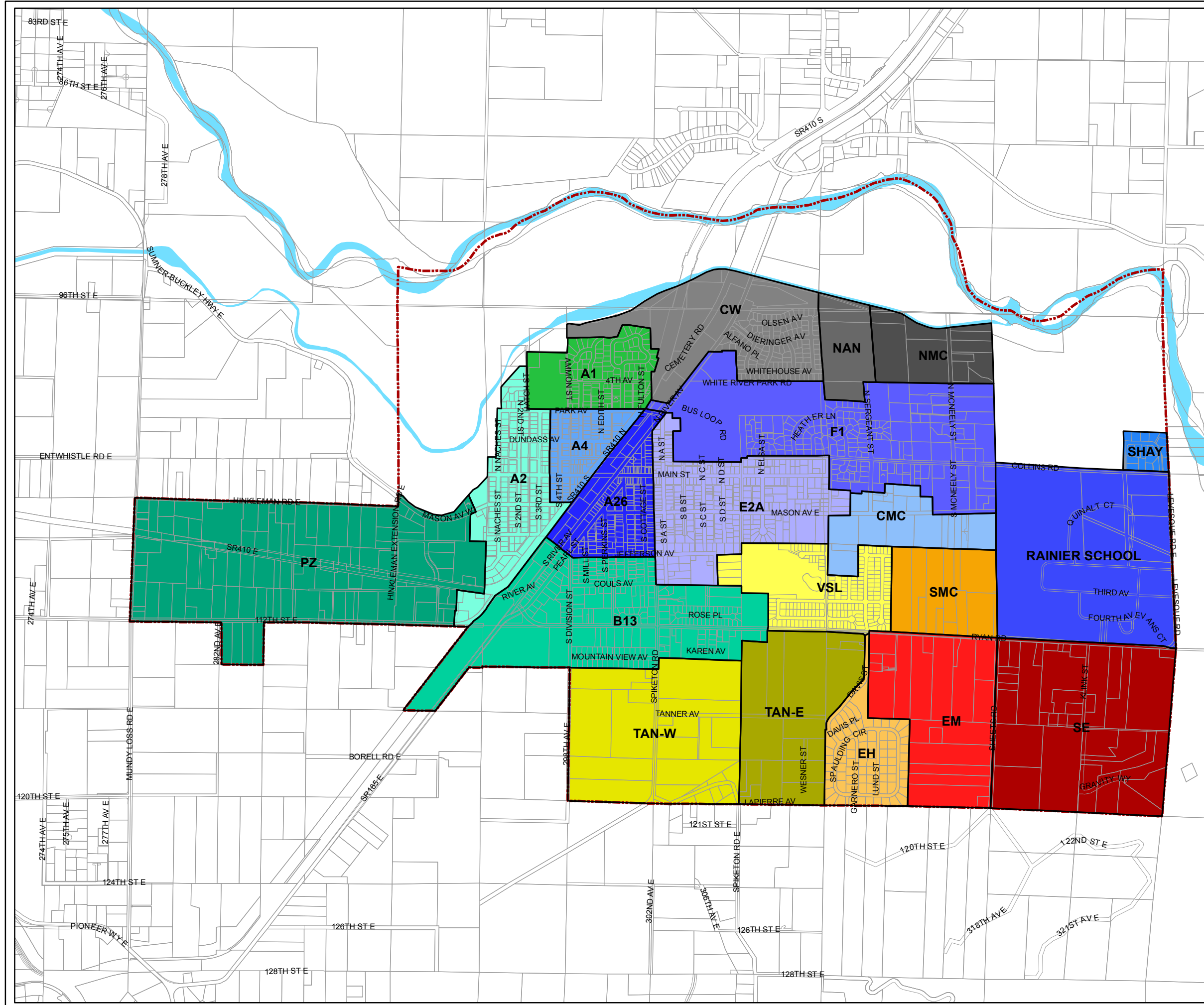
COLLECTION SYSTEM CAPITAL IMPROVEMENT PLAN

The City of Buckley has recently undergone a period of modest growth, yet it is believed that significant growth is on the horizon. The wastewater collection system has been expanded to serve this growth primarily located to the southeast and northeast of the existing downtown core. Within the next 10 to 20 years, the City system will feature several new collection lines constructed according to current City Standards by the Developers working in Buckley. The City may acquire several new Developer-designed and constructed sewer lift stations as well.

System Expansion

For the purposes of sizing major collection system improvements, an evaluation of project wastewater flows in the City limits was conducted. The City limits were broken into drainage basins based on topography and trunk line routes were identified to serve each basin. Figure 7-1 shows the drainage basins and Figure 7-2 shows the drainage flow schematic of the basins. Figure 7-3 shows the trunk lines that were identified in this evaluation. The acreage served by each basin was estimated by the Geographic Information System (GIS). The acreage in addition to the WWTP daily monitoring reports were used to estimate the average annual I/I values per basin. The total dwellings per basin were used to estimate average and maximum flows based on the City Municipal Code Table 14.10.016 persons per EDU.

Peaking factors were determined according to the guidelines presented in the Department of Ecology publication *Criteria for Sewage Works Design*. Peak hour flow is calculated

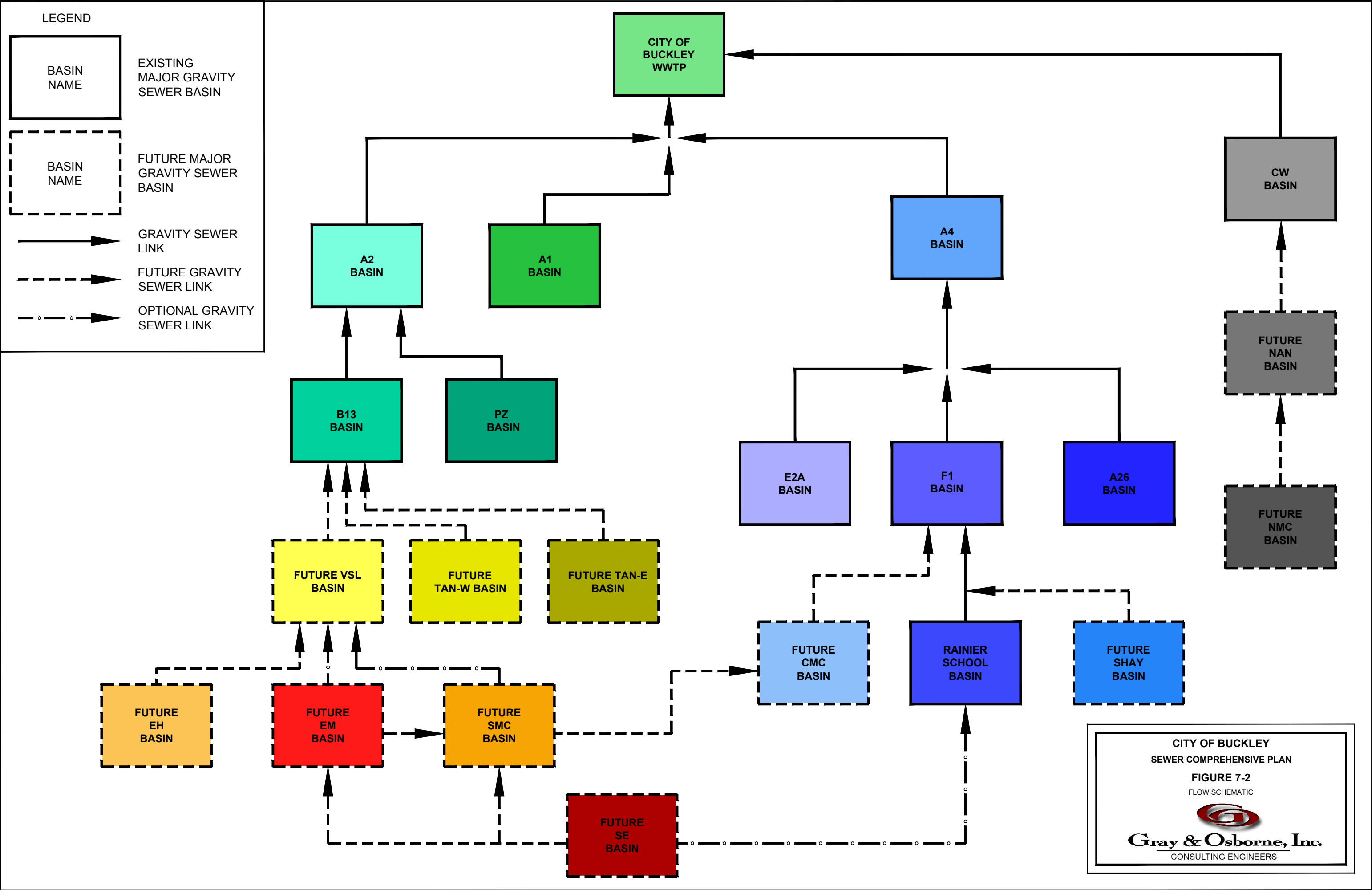


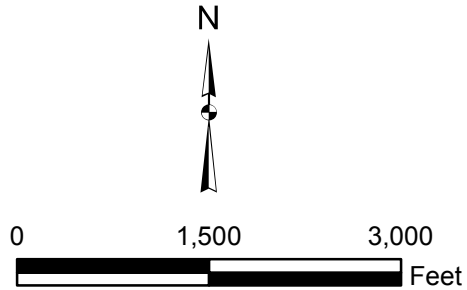
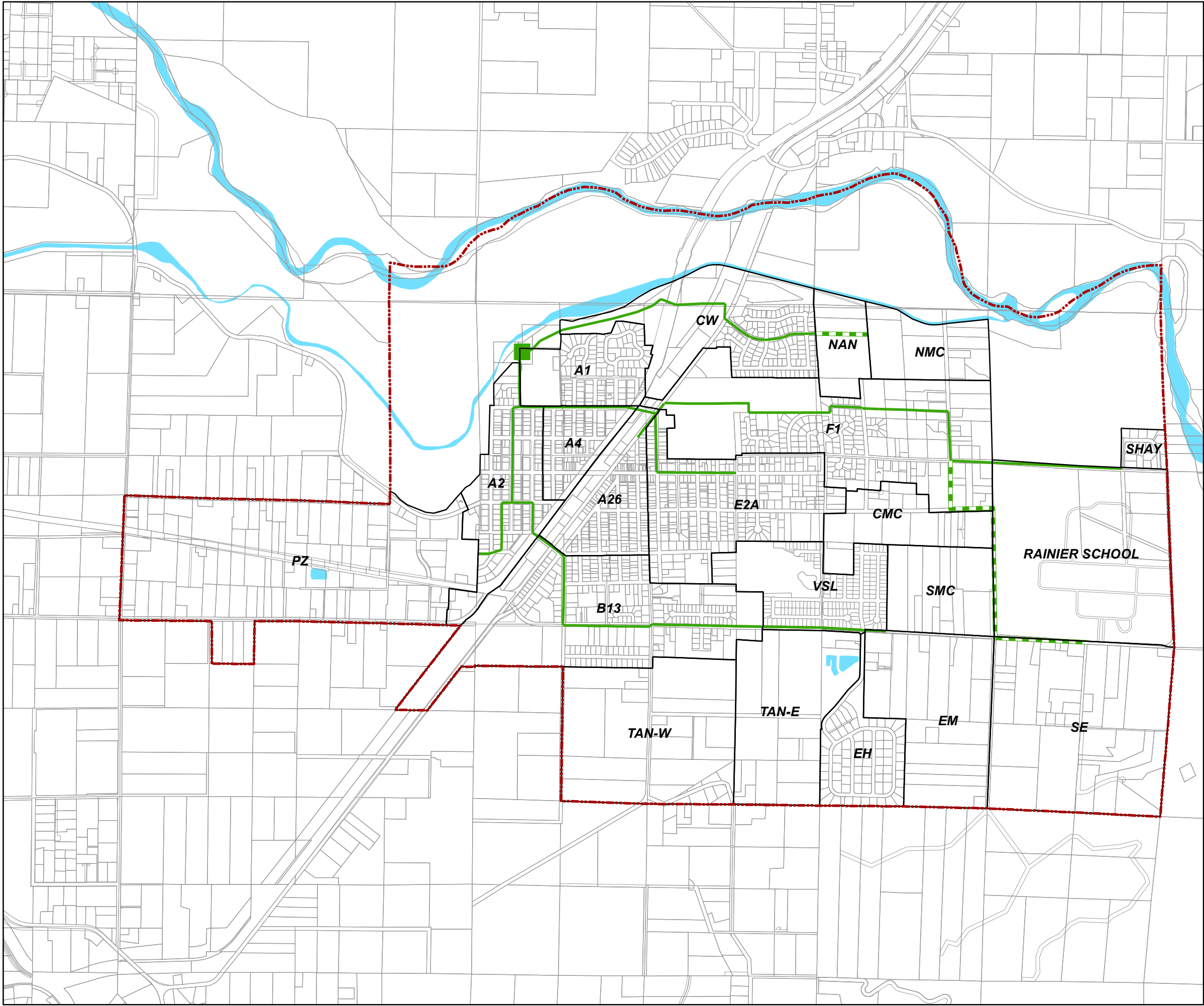
Legend

- CITY LIMITS
- BASINS:**
- A1 BASIN
- A2 BASIN
- A4 BASIN
- A26 BASIN
- B13 BASIN
- CW BASIN
- E2A BASIN
- F1 BASIN
- PZ BASIN
- RAINIER SCHOOL BASIN
- FUTURE CMC BASIN
- FUTURE EH BASIN
- FUTURE EM BASIN
- FUTURE NAN BASIN
- FUTURE NMC BASIN
- FUTURE SE BASIN
- FUTURE SHAY BASIN
- FUTURE SMC BASIN
- FUTURE TAN-E BASIN
- FUTURE TAN-W BASIN
- FUTURE VSL BASIN

CITY OF BUCKLEY
SEWER COMPREHENSIVE PLAN
FIGURE 7-1
DRAINAGE BASIN DESIGNATION
AND FUTURE SEWER EXTENSIONS

Gray & Osborne, Inc.
CONSULTING ENGINEERS





Legend

- DESIGNATED TRUNK LINES
- FUTURE TRUNK LINES
- EXISTING SEWER TREATMENT PLANT
- DRAINAGE BASIN PARAMETERS
- EXISTING BUCKLEY CITY LIMITS

SOURCE: PIERCE COUNTY GIS

CITY OF BUCKLEY
SEWER COMPREHENSIVE PLAN

FIGURE 7-3
TRUNK LINE DESIGNATION



as the product of average day flow and the peaking factor. Table 7-1 summarizes the flows for each of the ten (10) basins identified.

TABLE 7-1
Existing Basin Summary Information

Basin Identification⁽¹⁾	Total Acreage	Number of MH's	Average Annual I/I (GPD)⁽²⁾	Average Dry Weather Flow (GPD)⁽²⁾	Average Wet Weather Flow (GPD)⁽²⁾	Peak Wet Weather Flow (GPD)⁽²⁾
A1	49	4	15,200	33,400	48,600	97,200
A2	73	16	22,500	43,500	66,000	132,000
A4	31	9	9,500	42,700	52,200	104,400
A26	54	4	16,600	35,700	52,300	104,600
B13	161	20	49,700	79,900	129,600	259,200
CW	100	16	30,800	31,000	61,800	123,600
E2A	108	9	33,400	80,800	114,200	228,400
F1	180	28	55,400	77,900	133,300	266,600
PZ	232	1	71,300	33,000	104,300	208,600
Rainier	173	1	53,400	24,700	78,100	156,200

(1) Per Figure 7-1.

(2) Rounded to hundreds of gallons

Figure 7-2 identifies the existing trunk lines that were determined within the identified drainage basins, and the flows described above were applied.

Future drainage basin loads were applied to existing drainage basins at the appropriate upstream manholes, which can be found in Appendix C. Future trunk lines will be sized with the minimum slope recommended by the Ecology “Orange Book” and under the requirement that trunk sewers should be designed so that under ultimate development peak flow they should operate at 50 percent of pipe capacity. Based on review of the existing elevations and contours, it is anticipated that the proposed drainage basins in the Southeast portion of the City limits are capable of being connected with gravity lines (with slopes of approximately 1-2 percent and depth of approximately 6 feet). However, it would be in the best interest of the City to route the proposed drainage basins immediately north and connect at South McNeeley Street. Directing the proposed drainage basin loads north would alleviate capacity issues as opposed to directing the flow west along Ryan Road.

It should be noted that diameters, lengths and alignments are conceptual in nature and may change based on more detailed evaluation and survey elevations to be determined at the time of actual design.

Table 7-2 summarizes the flows for each of the 11 future basins identified.

TABLE 7-2

Future Basin Summary Information

Basin Identification⁽¹⁾	Total Acreage	EDU's	Average Dry Weather Flow (GPD)⁽²⁾	Average Wet Weather Flow (GPD)⁽²⁾	Peak Wet Weather Flow (GPD)⁽²⁾
CMC	48	77	20,400	35,100	10,300
EH	47	76	20,100	34,700	69,300
EM	103	165	43,800	75,400	150,900
NAN	29	68	18,000	26,800	53,600
NMC	41	100	26,500	39,400	78,800
SE	168	272	72,000	123,800	247,700
Shay	10	20	5,300	8,300	16,600
SMC	51	83	22,000	37,800	75,700
TAN-E	96	267	70,700	121,600	243,300
TAN-W	135	106	28,000	48,300	96,500
VSL	67	109	28,800	49,600	99,100

(1) Per Figure 7-1.

(2) Rounded to hundreds of gallons

In order to accommodate future loads, Table 7-3 identifies trunk sewer lines that have the potential to be problematic due to growth projections within the City limits. At this time capital improvement projects are not recommended to add capacity at the potentially over capacity segments shown in Table 7-3. In each case of projected over capacity at buildout PWWF, the surcharge above the pipe crown is less than 0.6 feet. Following the addition of significant additional sewer connections to the Ryan Road trunk sewer, the City crews should continue to monitor the following four trunk sewer segments:

- B4 to B3
- B3 to B2
- B29 to B27
- B39 to B38.

The costs of the collection system improvements identified in this chapter will be shared between the City and the Developers whose projects drive the need for the improvements and extensions. Table 7-3 provides a summary of the capital improvement needs for the collection system. For each project, a portion of the eligible cost will be allocated to the City and a portion will be allocated to Developers. The allocation is based on several factors including the proximity to existing sewers, construction and permitting issues, and known and anticipated development patterns. The division of costs will change based on developer capacity needs, parcel subdivisions and other factors that cannot be fully predicted at this time.

TABLE 7-3**Existing Trunk Sewer Segments Over 80 Percent Capacity**

Up- stream MH No.	Down- stream MH No.	Location	Percent Capacity Existing PWWF	Percent Capacity Buildout PWWF	Pipe Slope	Pipe Diam.	Pipe Segment Length	Surcharge Height at Buildout PWWF
A 10	A9	Intersection of 2 nd St. & Park Ave.	44%	91%	0.3%	12"	114'	0.0'
A14	A13	2 nd St. between Main St. & Mason Ave.	37%	81%	0.3%	12"	465'	0.0'
B3	B2	3 rd St. between Mason Ave. & SR 410	94%	273%	0.0%	12"	469'	0.3'
B4	B3	Wheeler Ave. across SR 410 corridor	41%	122%	0.2%	10"	224'	0.6'
B29	B27	Division St. between Jefferson Ave. & Coul Ave.	41%	131%	0.1%	10"	411'	0.4'
B38	B28	Division St. between Coul Ave. & Ryan Rd.	26%	95%	0.2%	10"	358'	0.0'
B39	B38	Division St. between Coul Ave. & Ryan Rd.	48%	181%	0.1%	10"	293'	0.4'
B47	B39	Ryan Rd. between Division St. & Ashley Ct.	20%	91%	0.2%	10"	336'	0.0'
B64	B57	Ryan Rd. between Spiketon Rd. & Bevlo St.	12%	97%	0.1%	10"	312'	0.0'
C11	C10	Park Avenue across SR 410 corridor	43%	81%	0.2%	14"	171'	0.0'
C12	C11	Park Avenue across SR 410 corridor	42%	80%	0.2%	14"	305'	0.0'

(1) The estimated share for City and developer is based on several factors including proximity to existing sewers, construction and permitting issues and known and anticipated development patterns. Actual City share will be provided through City constructed public works projects and compensation for over sizing of developer built sewer facilities as allowed by City code.

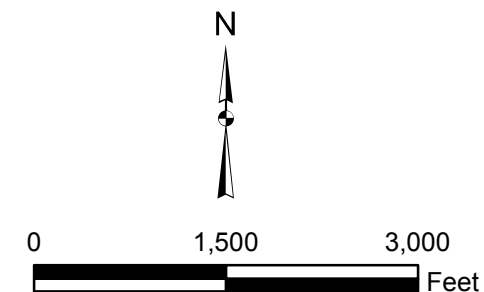
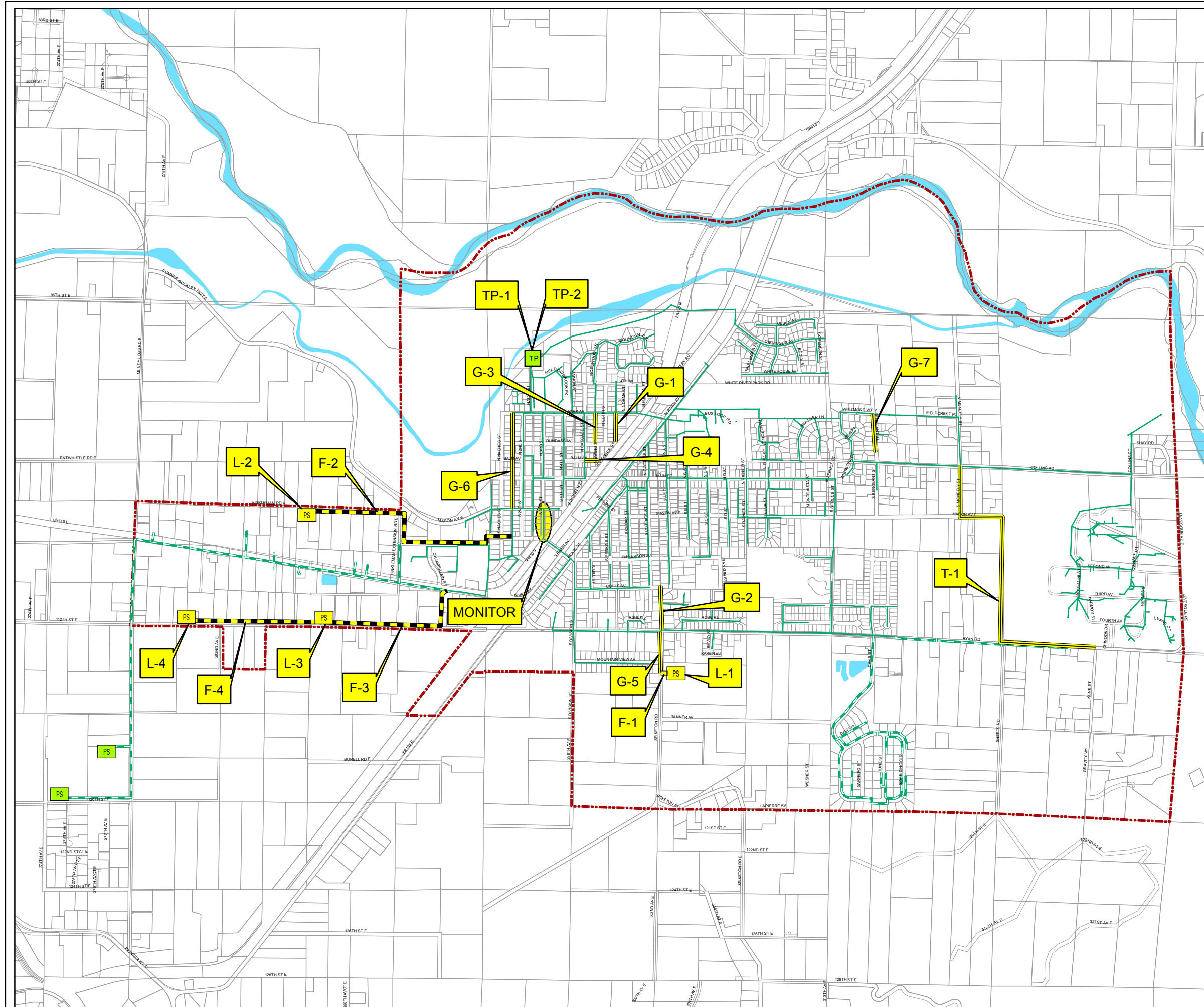
Figure 7-3 shows all of the major trunk lines that exist now, are in active design or that are planned to be added to the City system to meet future City limits requirements. This only includes major sewer trunk lines necessary to serve larger geographic areas defined somewhat by natural drainage patterns and the City limits. Sewers connecting to the trunk sewers to serve individual developments will be constructed by developers as part of development projects.

The City of Buckley maintains a force main along SR 410 East from the City limit at Mundy Loss Road to 100' east of Chamberlain Street, which supplies the PZ basin (as defined in Figure 7-1). It has been determined that this force main can withstand future loads and operate under capacity based on a 6 feet per second velocity. The force main has capacity for development on the north and south sides of SR-410 from Mundy-Loss Road to Chamberlain Road.

The increased environmental protection requirements for wetlands and restoration of threatened or endangered species under the Endangered Species Act presents permitting difficulties when stream corridor construction is being considered. Recognizing these difficulties, the City may modify this plan to use additional pump stations and force mains for conveying wastewater when necessary to reduce environmental impacts. All pump stations will be constructed consistent with City Standards.




Figure 7-4 shows the capital improvement plan project locations. Table 7-4 shows the 6-Year Capital Improvement Plan projects, project costs, and planned year of construction. Detailed cost estimates for selected projects are included in Appendix G.

The gravity sewer segment on South 3rd Street has been identified as over-capacity in Chapter and in Table 7-3. The City plans to perform periodic visual inspections of this segment during peak we weather flow conditions to determine if a capital improvement plan project should be added for this segment. The segment is identified in Figure 7-4 with the label "MONITOR."








Legend

CAPITAL IMPROVEMENTS:

-  PROPOSED SEWER FORCE MAINS
 PROPOSED GRAVITY SEWER LINES
 PROPOSED PUMP STATION

EXISTING SEWER SYSTEM:

-  EXISTING SEWER FORCE MAINS
 EXISTING GRAVITY SEWER LINES
 EXISTING SEWER TREATMENT PLANT
 EXISTING PUMP STATION
 EXISTING BUCKLEY CITY LIMITS & UGA

SOURCE: PIERCE COUNTY GIS

CITY OF BUCKLEY
SEWER COMPREHENSIVE PLAN

FIGURE 7-4
CAPITAL IMPROVEMENTS



TABLE 7-4**Six-Year Capital Improvement Costs and Schedules**

Project Number	Project Name/Description	Estimated Cost	2018	2019	2020	2021	2022	2023
G-1	Gravity Sewer: 450 LF of 8" PVC, Alley to the East of Edith St., from Park Ave. to Dundass Ave.	\$151,000	\$151,000					
G-2	Gravity Sewer: 500 LF of 8" PVC, Spiketon Rd from Ryan Rd to A St.	\$180,000			\$180,000			
G-3	Gravity Sewer: 450 LF of 8" PVC, Alley between Cascade St. and Edith St. from Dundass Ave. to Park Ave.	\$155,000	\$155,000					
G-4	Gravity Sewer: 200 LF of 8" PVC, Near 550 Balm Ave.	\$101,000	\$101,000					
G-5	Gravity Sewer: 900 LF of 8" PVC, Spiketon Rd from Ryan Rd to 649 Spiketon Rd	\$284,000			\$284,000			
G-6	Gravity Sewer: 1,000 LF of 8" PVC, Alley between Naches St. and Second St. from Park Ave. to Mason Ave.	\$325,000				\$325,000		
G-7	Sergeant Road: 700 LF of 8" PVC, Whitmore Way to Collins Road	\$190,000				\$190,000		
T-1	Trunk Sewer: 4,800 LF of 12" PVC, McNeely St., Mason Ave., State Sch prop line, Ryan Rd to Klink St.	\$1,633,000			\$816,500	\$816,500		
L-1	South Spiketon Rd Lift Station: 500 gpm, 2 pumps with Emergency Generator	\$866,000	\$217,000	\$649,000				
F-1	Force Main: 1,300 LF of 6" D.I., South Spiketon Rd Force Main	\$253,000	\$63,000	\$190,000				

TABLE 7-4 – (continued)
Six-Year Capital Improvement Costs and Schedules

Project Number	Project Name/Description	Estimated Cost	2018	2019	2020	2021	2022	2023
L-2	Hinkleman Road Lift Station – 200 gpm, 2 pumps with Emergency Generator	\$300,000				\$300,000		
F-2	Hinkleman Road-construct 3.800 LF of new 4" Ductile Iron Force Main	\$710,000				\$710,000		
L-3	East 112 th Street Lift Station – 250 gpm, 2 pumps with Emergency Generator.	\$350,000						\$350,000
F-3	East 112 th Street-construct 2,400 LF of new 4" Ductile Iron Force Main	\$450,000						\$450,000
L-4	West 112 th Street Lift Station – 150 gpm, 2 pumps with Emergency Generator.	\$250,000						
F-4	West 112 th Street-construct 2.300 LF of new 4" Ductile Iron Force Main	\$430,000						
TP-1	WWTP Non-Potable Water System	\$158,000	\$158,000					
TP-2	WWTP Wastewater Reuse Feasibility Study	\$100,000			\$100,000			
	Totals	\$6,886,000	\$845,000	\$839,000	\$1,380,500	\$2,341,500	\$0	\$800,000

CHAPTER 8

FINANCIAL ANALYSIS

This chapter describes how the City can finance the wastewater system improvements outlined in Chapter 7, Wastewater Collection System. The potential funding sources, financial status of the wastewater utility, the funding required to pay for the scheduled improvements, and the impact of wastewater improvements on wastewater rates are presented herein.

FINANCIAL STATUS OF EXISTING WASTEWATER UTILITY

CURRENT WASTEWATER RATES

Wastewater rates and charges for the City are specified by City Council resolution, pursuant to City of Buckley Municipal Code (BMC) 14.08.030. Current rates are set by Resolution No. 17-01. The City charges for sewer service on a monthly basis. Table 8-1 lists the City's current schedule of rates and charges.

TABLE 8-1

Monthly Wastewater Service Charges⁽¹⁾

Customer Type	Monthly Base Charge⁽²⁾
Single Family Residence	\$77.99
Multi-Family and/or Accessory Residences	\$65.89 per unit
Mobile Homes	\$77.88
Non-System Sewage Disposal	\$275.66/105 cubic feet
Commercial Users	\$77.99/900 cubic feet +\$3.05/100 cubic feet excess

(1) Source: City of Buckley Resolution No. 17-01

(2) Users outside the City limits shall pay a surcharge of 20 percent of the total charge.

CURRENT GENERAL FACILITIES CHARGES

The City's general facilities charges are also specified by City Council Resolution, as specified in BMC 14.10.016. Current charges are set by Resolution No. 17-01. These charges are applicable only to new customers connecting to the system and are intended to enable the utility to pay for growth related capacity costs. In addition to the general facility charge, a new customer is charged an installation fee to cover the cost of installing the service connection. General facility charges and connection fees are listed in Table 8-2.

TABLE 8-2**General Facility and Connection Charges⁽¹⁾**

GFC for Facility Type	2017
Single Family Residence	\$7,521.47
Multi-Family and/or Accessory Residences	\$5,640.34
For all other uses	\$7,521.47/ERU ⁽²⁾
Connection Charge	2017
Connection	\$873.70

(1) Source: City of Buckley Resolution No. 17-01

(2) ERU=Equivalent Residential Unit. Each equivalent residential unit means 265 gallons per day: provided, that every use shall be assumed to be at least one ERU.

402 WATER SEWER OPERATING FUND

The City operates on a combined water and sewer utility operating fund (No. 402). For this analysis, water and sewer revenues and expenditures are separated in the following sections.

402 Water Sewer Operating Fund Revenues

The operating fund segregates revenues into several categories: Charges for Goods and Services, Intergovernmental Revenues, Miscellaneous Revenues, and Interfund Transfers In. Table 8-3 shows the historic sewer utility revenues for the years 2011-2016. Sewer utility revenues are differentiated from water utility revenues. Revenues that are not specifically water or sewer are proportioned between water and sewer in proportion to the revenues that are clearly water or sewer revenues.

TABLE 8-3**Historic 402 Water Sewer Operating Fund Revenues**

Item	2011	2012	2013	2014	2015	2016
Charges for Goods and Services - Sewer						
Sewer Service Charges	\$1,345,444	\$1,449,099	\$1,495,629	\$1,529,843	\$1,543,943	\$1,624,217
Sewer Charges DSHS	\$193,641	\$242,838	\$243,114	\$278,461	\$309,600	\$284,376
Sewer Connections	\$0	\$325	\$325	\$325	\$1,690	\$2,990
Misc. Sewer Charges	\$390	\$0	\$0	\$0	\$0	\$0
Total Charges for Goods and Services - Sewer	\$1,539,475	\$1,692,263	\$1,739,068	\$1,808,629	\$1,855,232	\$1,911,583
Total Charges for Goods and Services - Water	\$624,385	\$696,196	\$726,990	\$758,850	\$798,167	\$793,951

TABLE 8-3 (continued)**Historic 402 Water Sewer Operating Fund Revenues**

Item	2011	2012	2013	2014	2015	2016
Total Charges for Goods and Services -Water + Sewer	\$2,163,861	\$2,388,459	\$2,466,058	\$2,567,479	\$2,653,400	\$2,705,534
Other Charges for Goods and Services - Water	\$2,719	\$1,684	\$1,610	\$677	\$3,141	\$5,607
Other Charges for Goods and Services - Sewer	\$6,704	\$4,094	\$3,852	\$1,614	\$7,301	\$13,499
Total Other Charges for Goods and Services	\$9,423	\$5,778	\$5,463	\$2,291	\$10,442	\$19,106
Total Charge for Goods and Services	\$2,173,284	\$2,394,237	\$2,471,521	\$2,569,770	\$2,663,842	\$2,724,640
Intergovernmental Revenues						
Disaster Assistance - Water	\$0	\$2,526	\$0	\$0	\$0	\$0
Disaster Assistance - Sewer	\$0	\$6,139	\$0	\$0	\$0	\$0
Total Disaster Assistance	\$0	\$8,665	\$0	\$0	\$0	\$0
Total Intergovernmental Revenues	\$0	\$8,665	\$0	\$0	\$0	\$0
Misc Revenues						
Misc Revenues - Water	\$2,820	\$296	\$43,573	\$18,500	\$26,618	\$25,348
Misc Revenues - Sewer	\$6,954	\$719	\$104,233	\$44,092	\$61,870	\$61,029
Total Misc Revenues	\$9,774	\$1,014	\$147,806	\$62,592	\$88,487	\$86,377
Non revenues						
Non revenues - Water	\$1,459	\$1,452	\$2,154	\$2,726	\$1,449	\$5,781
Non revenues - Sewer	\$3,597	\$3,528	\$5,153	\$6,497	\$3,367	\$13,920
Total Non revenues	\$5,056	\$4,980	\$7,307	\$9,222	\$4,816	\$19,701
Interfund Transfers In						
From 405 Sewer Ext & Replace	\$0	\$0	\$0	\$0	\$0	\$0
Total Interfund Transfers In	\$0	\$0	\$0	\$0	\$0	\$0
Total 402 Fund Water Revenues	\$631,384	\$702,153	\$774,327	\$780,753	\$829,375	\$830,688
Total 402 Fund Sewer Revenues	\$1,556,730	\$1,706,743	\$1,852,306	\$1,860,832	\$1,927,770	\$2,000,030
Total 402 Fund, Water/Sewer Revenues	\$2,188,113	\$2,408,896	\$2,626,634	\$2,641,585	\$2,757,145	\$2,830,718

402 Water Sewer Operating Fund Expenditures

Historic 402 Water Sewer Operating Fund Expenditures are shown in Table 8-4. Expense categories include Water Administration General, Water Maintenance, Sewer Administration General, Sewer Maintenance, Non-Expenditures, and Other Financing Uses. As with Water and Sewer Revenues in Table 8-3, Water and Sewer Expenditures are segregated in Table 8-4.

TABLE 8-4**Historic 402 Water Sewer Operating Fund Expenditures**

Item	2011	2012	2013	2014	2015	2016
Water Administration General						
Supplies	\$401	\$912	\$617	\$76	\$5,922	\$4,527
Professional Services	\$66,439	\$147,800	\$62,223	\$14,848	\$19,452	\$59,262
Professional Services "Farm"			\$4,962	\$0	\$0	\$0
Communication	\$2,290	\$2,162	\$2,255	\$1,372	\$2,899	\$3,049
Advertising	\$0	\$0	\$0	\$0	\$0	\$0
Public Utility Services	\$3,257	\$3,089	\$4,109	\$3,514	\$3,037	\$3,245
Repair & Maintenance	\$1,219	\$2,953	\$1,190	\$1,822	\$2,484	\$1,085
Miscellaneous	\$918	\$1,020	\$1,035	\$3,660	\$2,100	\$2,894
State of Washington Excise Taxes	\$28,348	\$35,486	\$37,579	\$39,319	\$41,122	\$42,811
City Utility Taxes	\$64,761	\$69,401	\$72,380	\$75,127	\$78,936	\$80,506
Permits & Fees	\$4,782	\$1,529	\$2,697	\$7,378	\$2,505	\$2,537
Total Water Admin General	\$172,414	\$264,352	\$189,047	\$147,116	\$158,457	\$199,915
Water Maintenance						
Salaries, Wages and Benefits	\$217,775	\$243,353	\$262,411	\$271,636	\$303,145	\$352,813
Supplies	\$30,843	\$37,732	\$35,951	\$56,165	\$50,154	\$67,250
Supplies "Farm"			\$14,927	\$157	\$0	\$0
Fuel For Pumping	\$6,713	\$14,078	\$3,025	\$2,532	\$1,721	\$474
Fuel for Vehicles	\$2,706	\$9,758	\$5,577	\$6,669	\$3,020	\$3,833
Small Tools	\$0	\$0	\$0	\$0	\$344	\$369
Professional Services	\$7,386	\$3,820	\$30	\$111	\$2,665	\$4,990
Prof Svcs Water Quality Test	\$7,238	\$7,404	\$9,229	\$9,733	\$9,172	\$16,468
Communication	\$217	\$841	\$962	\$1,411	\$1,101	\$1,046
Public Utility Services	\$14,261	\$14,334	\$22,498	\$15,870	\$32,890	\$33,752
Public Utility Services "Farm"			\$7,434	\$5,854	\$0	\$0
Repair & Maintenance	\$3,783	\$2,614	\$35	\$13,604	\$1,761	\$14,772
Miscellaneous	\$86	\$1,383	\$275	\$311	\$1,184	\$329
Total Water Maintenance	\$291,008	\$335,316	\$362,354	\$384,052	\$407,159	\$496,096
Total Water Utility Expenses	\$463,422	\$599,668	\$551,400	\$531,168	\$565,616	\$696,011

TABLE 8-4 – (continued)**Historic 402 Water Sewer Operating Fund Expenditures**

Item	2011	2012	2013	2014	2015	2016
Sewer Expenditures						
Sewer Admin General	\$214,418	\$229,625	\$232,960	\$234,384	\$252,181	\$253,118
Sewer Maint	\$479,573	\$475,628	\$510,122	\$609,264	\$669,645	\$742,959
Total Sewer Utility Expenses	\$693,991	\$705,252	\$743,082	\$843,648	\$921,826	\$996,077
Non-Expenditures						
Misc Reimbursements	\$735	\$100	\$0	\$0	\$0	\$0
Utility Overpay, Water	\$815	\$242	\$356	\$943	\$2,485	\$2,313
Water Connection Fee Reimbursement	\$135	\$0	\$0	\$0	\$0	\$0
Utility Overpay, Sewer	\$0	\$0	\$0	\$1,510	\$0	\$0
Sewer Connection Fee Reimbursement	\$65	\$0	\$0	\$0	\$0	\$0
Water portion of Non-Expenditures	\$1,638	\$342	\$356	\$943	\$2,485	\$2,313
Sewer portion of Non-Expenditures	\$112	\$0	\$0	\$1,510	\$0	\$0
Total Non-Expenditures	\$1,750	\$342	\$356	\$2,453	\$2,485	\$2,313
Other Financing Uses						
Transfers Out						
To 001 C.E. Admin Water	\$61,396	\$62,654	\$65,449	\$79,664	\$67,333	\$59,709
To 308 Water Rights	\$10,000	\$0	\$0	\$0	\$1,141	\$0
To 001 Insurance Portion Water	\$7,499	\$7,874	\$46,860	\$8,521	\$13,963	\$14,661
To 406 Water Imp Fund	\$100,215	\$110,952	\$105,893	\$105,893	\$331,893	\$121,546
To 001 C.E. Admin Sewer	\$54,413	\$56,779	\$61,716	\$74,283	\$70,709	\$58,773
To 405 Sewer Imp Fund	\$705,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000
To 001 Insurance Portion Sewer	\$36,254	\$38,067	\$0	\$41,197	\$35,191	\$36,951
To 308 Comp Plan	\$0	\$0	\$0	\$10,000	\$15,000	\$0
To 307 Cap Imp - PW Bldg	\$0	\$0	\$10,000	\$0	\$0	\$0
To 430 Util Equip	\$12,000	\$9,996	\$10,000	\$10,000	\$10,000	\$10,000
To Current Expense Dispatcher	\$33,921	\$34,599	\$8,650	\$8,650	\$8,650	\$6,500
Water Portion of Transfers Out	\$187,548	\$189,366	\$224,272	\$199,326	\$425,307	\$199,019
Other Portion of Transfers Out	\$833,150	\$881,555	\$834,296	\$888,882	\$878,574	\$859,121
Total Other Financing Uses	\$1,020,698	\$1,070,921	\$1,058,568	\$1,088,208	\$1,303,880	\$1,058,140
Total 402 Fund, Water/Sewer Expenditures						
Water Portion of 402 Fund Expenses	\$652,608	\$789,376	\$776,029	\$731,437	\$993,408	\$897,344
Sewer Portion of 402 Fund Expenses	\$1,527,254	\$1,586,808	\$1,577,378	\$1,734,040	\$1,800,400	\$1,855,198
Total 402 Fund Expenditures	\$2,179,862	\$2,376,184	\$2,353,407	\$2,465,477	\$2,793,807	\$2,752,542

402 Water Sewer Operating Fund Cash Flow

Tables 8-3 and 8-4 are summarized in Table 8-5. From Table 8-5 it is clear that the total 402 Water Sewer Operating Fund is solvent and is maintaining a significant balance. However, expenditures for water operations have exceeded revenues from water operations for 2012 through 2016, resulting in a net loss of approximately \$271,000 over the 6 year data period. During the same period, the sewer portion of the fund has a net gain of approximately \$794,000.

TABLE 8-5**Historic 402 Water Sewer Operating Fund Cash Flow**

Item	2011	2012	2013	2014	2015	2016
Total 402 Water Sewer Operating Fund Cash Flow						
Beginning Balance	\$3,117	\$11,369	\$44,082	\$317,309	\$493,416	\$456,755
Total Revenues	\$2,188,113	\$2,408,896	\$2,626,634	\$2,641,585	\$2,757,145	\$2,830,718
Total Expenditures	\$2,179,862	\$2,376,184	\$2,353,407	\$2,465,477	\$2,793,807	\$2,752,542
Ending Balance	\$11,369	\$44,082	\$317,309	\$493,416	\$456,755	\$534,931
Water Portion of 402 Water Sewer Operating Fund Cash Flow						
Beginning Balance	\$28,793	\$7,569	\$(79,654)	\$(81,355)	\$(32,039)	\$(196,071)
Total Revenues	\$631,384	\$702,153	\$774,328	\$780,753	\$829,375	\$830,688
Total Expenditures	\$652,608	\$789,376	\$776,029	\$731,437	\$993,408	\$897,344
Ending Balance	\$7,569	\$(79,654)	\$(81,355)	\$(32,039)	\$(196,071)	\$(262,727)
Sewer Portion of 402 Water Sewer Operating Fund Cash Flow						
Beginning Balance	\$(25,675)	\$3,801	\$123,736	\$398,664	\$525,455	\$652,826
Total Revenues	\$1,556,730	\$1,706,743	\$1,852,306	\$1,860,832	\$1,927,770	\$2,000,030
Total Expenditures	\$1,527,254	\$1,586,808	\$1,577,378	\$1,734,040	\$1,800,400	\$1,855,198
Ending Balance	\$3,801	\$123,736	\$398,664	\$525,455	\$652,826	\$797,658

405 SEWER LINE REPAIR AND CONSTRUCTION FUND

Sewer Line repair and sewer facilities constructions are funded through the 405 Sewer Line Repair and Construction Fund.

405 Sewer Line Repair and Construction Fund Revenues

Historic revenues for the 405 Fund are summarized in Table 8-6. The primary revenues for the 405 Fund have been transfers from the 402 Fund.

TABLE 8-6**Historic 405 Sewer Line Repair and Construction Fund Revenues**

Item	2011	2012	2013	2014	2015	2016
Intergovernmental Revenues						
R&C SERF Board White River Property	\$0	\$0	\$0	\$0	\$0	\$0
Total Intergovernmental Revenues	\$0	\$0	\$0	\$0	\$0	\$0
Miscellaneous Revenues						
Investment Interest	\$570	\$1,285	\$1,035	\$758	\$5,446	\$12,503
Space & Facilities Leases (Long-Term)	\$0	\$0	\$0	\$0	\$0	\$0
Facilities Charge	\$92,183	\$131,110	\$20,032	\$27,725	\$168,775	\$360,689
Developer Portions	\$0	\$0	\$4,403	\$0	\$579	\$2,895
DSHS Share STP Design Upgrade	\$0	\$0	\$0	\$0	\$0	\$0
DSHS Share (WWTP Const.)	\$54,252	\$0	\$0	\$0	\$0	\$0
Misc Reimbursements	\$0	\$0	\$0	\$352	\$0	\$75
Total Misc Revenues	\$147,005	\$132,395	\$25,470	\$28,836	\$174,800	\$376,162
Other Financing Sources						
Sale of Fixed Asset - Taylor Property	\$0	\$0	\$0	\$144,482	\$0	\$0
Transfer In from 402 Water/Sewer	\$705,000	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000
Total Other Financing Sources	\$705,000	\$750,000	\$750,000	\$894,482	\$750,000	\$750,000
Total 405 Fund, Sewer Line Repairs and Construct Revenues	\$852,005	\$882,395	\$775,470	\$923,317	\$924,800	\$1,126,162

405 Sewer Line Repair and Construction Fund Expenditures

Historic expenditures from the 405 Fund are summarized in Table 8-7. The majority of the fund has been spent on the construction of the wastewater treatment facility (WWTF) expansion and the repayment of loans associated with the WWTF.

TABLE 8-7**Historic 405 Sewer Line Repair and Construction Fund Expenditures**

Item	2011	2012	2013	2014	2015	2016
Sewer Utilities						
Administration - General						
Comp. Sewer Plan Update	\$0	\$0	\$12,901	\$43,102	\$7,527	\$0
Advertising/Latecomers'	\$0	\$0	\$0	\$0	\$0	\$2,206
Total Administration - General	\$0	\$0	\$12,901	\$43,102	\$7,527	\$2,206
Total Maintenance	\$391	\$0	\$25	\$0	\$0	\$7,801
Operations General						
Professional Services	\$8,281	\$13,925	\$13,501	\$15,360	\$8,698	\$9,907
Professional Services Base Mapping	\$0	\$121	\$0	\$0	\$2,361	\$2,963
Total Operations General	\$8,281	\$14,046	\$13,501	\$15,360	\$11,059	\$12,870
Total Sewer Utilities	\$8,672	\$14,046	\$26,427	\$58,463	\$18,585	\$22,876
Non expenditures						
Other None expenditures						
Sewer Lottery Deposit Refund	\$0	\$5,240	\$0	\$0	\$0	\$0
Total Other Non expenditures	\$0	\$5,240	\$0	\$0	\$0	\$0
Total Non expenditures	\$0	\$5,240	\$0	\$0	\$0	\$0
Other Financing Uses						
PWTF Principle Debt	\$669,579	\$617,606	\$617,606	\$617,606	\$617,606	\$617,606
PWTF Interest and Debt Service	\$0	\$47,864	\$43,753	\$39,643	\$32,572	\$31,423
Total Interest and Other Debt Service Costs	\$669,579	\$665,469	\$661,359	\$657,249	\$650,178	\$649,029
Total Capital Expenditures	\$169,368	\$11,506	\$105,769	\$105,429	\$70,948	\$54,830
Transfer Out	\$0	\$0	\$0	\$0	\$12,040	\$30,803
Total Other Financing Uses	\$838,947	\$676,975	\$767,128	\$762,678	\$733,166	\$734,662
Total 405 Fund, Sewer Line Repairs and Construct Expenditures	\$847,619	\$696,261	\$793,555	\$821,140	\$751,751	\$757,538

405 Sewer Line Repair and Construction Fund Cash Flow

Beginning 405 Fund balances, total 405 Fund Revenues, total 405 Fund Expenditures and resulting ending 405 Fund balances are summarized in Table 8-8.

TABLE 8-8**Historic 405 Sewer Line Repair and Construction Fund Cash Flow**

Item	2011	2012	2013	2014	2015	2016
Beginning Fund Balance	\$645,110	\$649,496	\$835,631	\$817,545	\$919,722	\$1,092,771
405 Revenues	\$852,005	\$882,395	\$775,470	\$923,317	\$924,800	\$1,126,162
405 Expenditures	\$847,619	\$696,261	\$793,555	\$821,140	\$751,751	\$757,538
Ending 405 Fund Balance	\$649,496	\$835,631	\$817,545	\$919,722	\$1,092,771	\$1,461,396

PROJECTED EXPENSES AND REVENUES**GROWTH AND INFLATION RATES**

Projected growth is required to estimate future revenues as well as expenses associated with providing sewer service. Chapter 2 projects 3.21 percent average annual sewer system growth through year 2035. Also, it is assumed that all expenses will grow at the projected rate of inflation. Inflation rate projections were obtained as estimated by three financial institutions, including International Monetary Fund (IMF), Organization for Economic Cooperation and Development (OECD), and Economist Intelligence Unit (EIU). IMF and OECD provide inflations projections through 2019, while EIU provides a longer term an inflation projection through 2060. Inflation rate projections through 2019 are averaged from the three sources. Inflation rates after 2019 are strictly EIU projections. The various projected inflation rates and the average values used for this report are as shown in Table 8-9.

TABLE 8-9**Projected Expenses Inflation Rates**

Rate	2017	2018	2019	2020	2021	2022
IMF	2.21%	2.12%	1.99%	(1)	(1)	(1)
OECD	2.30%	2.50%	2.00%	(1)	(1)	(1)
EIU	1.90%	1.97%	2.01%	2.03%	2.05%	2.07%
Average	2.14%	2.20%	2.00%	2.03%	2.05%	2.07%

(1) IMF and OECD inflation projections end at 2019.

Revenues do not automatically change with inflation rates, so revenue rates will need to be adjusted to keep pace with inflation plus the need to fund capital improvements.

402 WATER SEWER OPERATING FUND PROJECTIONS**Projected 402 Water Sewer Operating Fund Sewer Revenues**

Projected 402 Water Sewer Operating Fund sewer revenues are shown in Table 8-10. Sewer sales and connection fee rate adjustment are shown to cover inflation and capital improvements. The 2017 value for Sewer Sales per EDU is based on the current monthly rate of \$77.99. Projected EDUs are taken from the Moderate Growth Scenario in Table 6-3. New EDUs are the difference between Projected EDUs from year to year. Other miscellaneous revenues shown in Table 8-3 are not included in this projection because they are generally relatively small and inconsistent. Water service revenues are not included in Table 8-10 because they are assumed to be for water system operations, maintenance and improvements.

TABLE 8-10**Projected 402 Water Sewer Operating Fund Sewer Revenues**

Item	2017	2018	2019	2020	2021	2022
Sewer Service Charges						
Rate Increase	0%	0%	0%	0%	0%	0%
Sewer Charges per EDU	\$936	\$936	\$936	\$936	\$936	\$936
Projected EDUs	1,775	1,824	1,874	1,926	1,979	2,034
Projected Sewer Service Charges	\$1,661,187	\$1,707,264	\$1,754,064	\$1,802,736	\$1,852,344	\$1,903,824
Sewer Charges DSHS	\$278,500	\$278,500	\$278,500	\$278,500	\$278,500	\$278,500
Sewer Connections						
Connection Fee Increase	0%	0%	0%	0%	0%	0%
Connection Fee per EDU	\$838	\$838	\$838	\$838	\$838	\$838
New EDUs	48	49	50	52	53	55
Projected Sewer Connection Fees	\$40,210	\$41,062	\$41,900	\$43,576	\$44,414	\$46,090
Total Projected 402 Fund Sewer Revenues	\$1,979,897	\$2,026,826	\$2,074,464	\$2,124,812	\$2,175,258	\$2,228,414

Projected 402 Water Sewer Operating Fund Sewer Expenditures

Projected 402 Water Sewer Operating Fund expenditures are shown in Table 8-11. All expenses are increase annually by the inflation rates shown in Table 8-9. All expenses are also increased annually by the system annual growth rate of 3.21 percent based on the Chapter 2 sewer system growth projections.

Transfers to 405 Sewer Line Repair and Construction are included to help pay for capital improvements. Transfers to C.E. Admin Sewer begin with a value based on a straight regression line of historic values from Table 8-4, projected to 2017. Transfers to Insurance Portion Sewer are based on the average value from Table 8-4. Transfers to 308 Comp Plan, 307 Capital Improvements – PW Bldg., and to 430 Utility Equipment, are all based on the proportion of the average values of transfers out from Table 8-4 that are

attributable to the sewer utility. Transfers to C.E.Admin Water, 406 Water Fund, and Insurance Portion Water, as well as other water service expenses, are not included in Table 8-11 because they are assumed to be covered by the water services revenues portion of the 402 Water Sewer Operating Fund.

TABLE 8-11**Projected 402 Water Sewer Operating Fund Sewer Expenditures**

Item	2017	2018	2019	2020	2021	2022
Sewer Expenditures						
Sewer Admin General	\$288,600	\$304,400	\$320,500	\$337,500	\$355,500	\$374,500
Sewer Maint	\$621,600	\$655,600	\$690,200	\$726,800	\$765,500	\$806,400
Total Sewer Utility Expenses	\$910,200	\$960,000	\$1,010,700	\$1,064,300	\$1,121,000	\$1,180,900
Other Financing Uses						
Transfers Out						
To 001 C.E. Admin Sewer	\$88,800	\$93,700	\$98,600	\$103,800	\$109,300	\$115,100
To 405 Sewer Imp Fund	\$1,000,000	\$1,000,000	\$900,000	\$850,000	\$850,000	\$900,000
To 001 Insurance Portion Sewer	\$46,600	\$49,200	\$51,800	\$54,500	\$57,400	\$60,500
To 308 Comp Plan	\$4,400	\$4,600	\$4,800	\$5,100	\$5,400	\$5,700
To 307 Cap Imp - PW Bldg	\$5,100	\$5,400	\$5,700	\$6,000	\$6,300	\$6,600
To 430 Utility Equipment	\$10,600	\$11,200	\$11,800	\$12,400	\$13,100	\$13,800
To Current Expense Dispatcher	\$8,000	\$8,400	\$8,800	\$9,300	\$9,800	\$10,300
Total Other Financing Uses	\$1,163,500	\$1,172,500	\$1,081,500	\$1,041,100	\$1,051,300	\$1,112,000
Total 402 Fund Sewer Expenditures	\$2,073,700	\$2,132,500	\$2,092,200	\$2,105,400	\$2,172,300	\$2,292,900

Projected 402 Water Sewer Operating Fund Sewer Cash Flow

Total 402 Water Sewer Operating Fund sewer revenues from Table 8-10, and total 402 Water Sewer Operating Fund sewer expenditures from Table 8-11 are summarized in Table 8-12. Beginning balance for 2017 is a proportion of the total 402 Water Sewer Operating Fund ending balance from Table 8-5 based on the proportion of Sewer operating expenses to total Water Sewer Fund operating expenses.

TABLE 8-12**Projected 402 Water Sewer Operating Fund Sewer Cash Flow**

Item	2017	2018	2019	2020	2021	2022
Beginning Sewer Portion Balance	\$597,658	\$503,855	\$398,181	\$380,445	\$399,857	\$402,815
Total Sewer Revenues	\$1,979,897	\$2,026,826	\$2,074,464	\$2,124,812	\$2,175,258	\$2,228,414
Total Sewer Expenses	\$2,073,700	\$2,132,500	\$2,092,200	\$2,105,400	\$2,172,300	\$2,342,900
Ending Sewer Portion Balance	\$503,855	\$398,181	\$380,445	\$399,857	\$402,815	\$288,329

405 SEWER LINE REPAIR AND CONSTRUCTION FUND PROJECTIONS

Sewer System capital improvements are paid for through the 405 Sewer Line Repair and Construction Fund. Table 8-13 shows projected 405 Sewer Line Replacement and Construction Fund revenues, expenditures and balances. The initial balance is directly from Table 8-8. Revenues to the 405 Sewer Line Repair and Construction Fund include Transfers In from the 402 Water Sewer Operating Fund, as shown in Table 8-11, and Sewer Facilities Charges for new system connections. Expenditures from the 405 Sewer Line Repair and Construction Fund include Construction Operation Costs, Debt Service Costs, and Capital Improvements.

Transfers in from the 402 Water Sewer Operating Fund have been inserted to help with funding of capital improvements while maintaining a reserve in the sewer portion of the 402 Water Sewer Operating Fund. Capital facilities charges are calculated from the total number of new EDUs each year, based on the Moderate Growth EDU projections in Table 6-3. Facilities charges per EDU shown for 2017 are current rates, while Facilities Charges for 2018 through 2022 have been reduced consistent with the value of existing and projected sewer infrastructure. Operations costs related to Capital Improvements are presumed to be proportional to the cost of the capital improvements for each year in proportion to the operational costs and capital facilities costs from Table 8-7. Debt service costs are carried forward from Table 8-7. Capital improvements come directly from Table 7-4.

TABLE 8-13

**Projected 405 Sewer Line Replacement and Construction Fund,
with Capital Improvements and Facilities Charge Adjustments**

Item	2017	2018	2019	2020	2021	2022
Balance Forward	\$2,049,875	\$1,998,826	\$1,775,377	\$1,457,128	\$1,094,979	\$419,730
Projected 405 Fund Revenues						
Transfer In from 402 Water/Sewer	\$1,000,000	\$1,000,000	\$900,000	\$850,000	\$850,000	\$950,000
New EDUs	49	50	52	53	55	55
Facilities Charges per EDU	\$6,100	\$6,100	\$6,100	\$6,100	\$6,100	\$6,100
Facilities Charges	\$298,900	\$305,000	\$317,200	\$323,300	\$335,500	\$335,500
Total Projected 405 Fund Revenues	\$1,298,900	\$1,305,000	\$1,217,200	\$1,173,300	\$1,185,500	\$1,285,500
Projected 405 Fund Expenditures						
Operations Costs	\$48,700	\$61,200	\$61,700	\$61,700	\$84,500	\$63,400
Debt Service Costs	\$657,249	\$657,249	\$657,249	\$657,249	\$657,249	\$657,249
Capital Improvements	\$644,000	\$810,000	\$816,500	\$816,500	\$1,119,000	\$839,000
Total Projected 405 Fund Expenditures	\$1,349,949	\$1,528,449	\$1,535,449	\$1,535,449	\$1,860,749	\$1,559,649
Ending Fund Balance	\$1,998,826	\$1,775,377	\$1,457,128	\$1,094,979	\$419,730	\$145,581

COMPARISON OF SEWER RATES

City of Buckley sewer rates are shown in Table 8-1. A typical water usage of 190 gpd equates to an average monthly use of 762 cubic feet (CF) per month. Sewer rates for Buckley and other nearby cities are summarized in Table 8-14.

TABLE 8-14

Monthly Sewer Rates for Nearby Utilities

Utility	Base Rate	Volume Rate per CCF	Bill for 762 CF	Bill for 900 CF
Buckley	\$77.99	None	\$77.99	\$77.99
Bonney Lake	\$57.88	\$3.60	\$85.31	\$90.28
Enumclaw	\$29.02	\$8.63	\$94.78	\$106.69
Puyallup	\$35.82	\$5.43	\$77.20	\$84.69
Sumner	\$50.69	\$7.46	\$107.54	\$117.83
Wilkeson	\$79.00	\$2.00	\$94.24	\$97.00

ALTERNATE SEWER RATE STRUCTURE

As indicated in Table 8-14, the City of Buckley is the only sewer utility that utilizes a base rate only, with no volume charge. Volume charges in sewer rates are typically based on water meter readings in the winter months. The benefit of a base rate only rate structure is the predictability of the sewer rate revenue. Changing from a base rate only to a base rate with volume charges may result in lower revenues, as customers may reduce water usage. The City is interested in evaluating tiered rates, which is essentially a base rate, depending on the volume of water used. After evaluation of various tiered rate structures, the selected alternative by the City is shown in Table 8-15.

TABLE 8-15

Alternate Sewer Rate Structure

Monthly Water Usage ⁽¹⁾	Base Rate
0 to 2 ccf	\$70.20
>2 to 4 ccf	\$75.72
>4 to 7 ccf	\$77.99
>7 to 10 ccf	\$93.59
>10 ccf	\$109.19

(1) 1 ccf = 100 cubic feet or 748 gallons

RECOMMENDATIONS

Tables 8-10 and 8-13 indicate that increases in sewer rates, sewer connection fees, and general facilities charges are not necessary to fund projected operations expenses and capital improvements. Table 8-13 indicates that a reduction in the general facilities charge to \$6,100 will still provide sufficient revenues for capital improvements. Tables 8-11 and 8-13 indicate transfers from the 402 Water Sewer Operating Fund to the 405 Sewer Line Repair and Construction Fund to fund the capital improvement schedule.

The City's current monthly sewer rate for residential customers is lower than most of the neighboring communities. Most of the neighboring communities have a volume charge in addition to a base rate. Table 8-15 includes a tiered rate structure that the City plans to adopt. Based on the current water use, switching to the tiered rate structure is anticipated to generate about 107.6 percent of the current rate structure revenue. The recommended revised rate structure, as shown in Table 8-15 is recommended for implementation by the City.

APPENDIX A

NPDES PERMIT, FACT SHEET, AND RELATED CORRESPONDENCE



Issuance Date: April 10, 2003
Effective Date: May 1, 2003
Expiration Date: April 30, 2008
Modification Date: February 25, 2004

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT NO. WA0023361**

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504-7600

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1251 et seq.

**City of Buckley
P.O. Box 1960
Buckley, WA 98321**

Plant Location:
600 Hatch Avenue
Buckley, Pierce County, Washington

Water Body I.D. No.:
WA-10-1040

Plant Type:
Secondary Treatment – Oxidation Ditch
Chlorine Disinfection

Receiving Water:
White River at Buckley
River Mile 21.8

Discharge Location:
Latitude: 47° 10' 19" N
Longitude: 122° 02' 08" W

is authorized to discharge in accordance with the special and general conditions that follow.

Kelly Susewind, P.E.
Southwest Regional Manager
Water Quality Program
Washington State Department of Ecology

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SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Permit Section	Submittal	Frequency	First Submittal Date
S1.B	Compliance Schedule Status Report	1/permit cycle	March 31, 2004
S3.	Discharge Monitoring Report	monthly	June 15, 2003
S3.E	Noncompliance Notification	as necessary	
S4.B.	Plans for Maintaining Adequate Capacity	as necessary	
S4.C.	Notification of New or Altered Sources	as necessary	
S4.D.	Infiltration and Inflow Evaluation	annually	January 15, 2004
S4.E.	Waste load Assessment	annually	January 15, 2004
S6.D.	Industrial User Survey	1/permit cycle	June 30, 2006
S8.	Receiving Water Study Sampling and Quality Assurance Plan	1/permit cycle	November 1, 2003
S8.	Receiving Water and Effluent Study Results	1/permit cycle	November 30, 2007
S9.A	Acute Toxicity Effluent Characterization with Permit Renewal Application	2/permit cycle	Once in the Last Summer & Once in the Last Winter Prior to Submission of the Renewal Application
S10.A	Chronic Toxicity Effluent Characterization with Permit Renewal Application	2/permit cycle	Once in the Last Summer & Once in the Last Winter Prior to Submission of the Renewal Application
S11.	Outfall Evaluation	monthly	
G1.	Notice of Change in Authorization	as necessary	
G4.	Permit Application for Substantive Changes to the Discharge	as necessary	
G5.	Engineering Report for Construction or Modification Activities	as necessary	
G7.	Application for Permit Renewal	1/permit cycle	November 30, 2007
G21	Notice of Planned Changes	as necessary	
G22	Reporting Anticipated Non-compliance	as necessary	

SPECIAL CONDITIONS

S1. DISCHARGE LIMITATIONS

A. Effluent Limitations

All discharges and activities authorized by this permit shall be consistent with the terms and conditions of this permit. The discharge of any of the following pollutants more frequently than, or at a level in excess of, that identified and authorized by this permit shall constitute a violation of the terms and conditions of this permit.

Beginning on the effective date of this permit and lasting through the expiration date the Permittee is authorized to discharge municipal wastewater at the permitted location subject to complying with the following limitations:

EFFLUENT LIMITATIONS: OUTFALL # 001				
Parameter	Average Monthly ^a		Average Weekly ^a	
Biochemical Oxygen Demand ^b (5 day)	30 mg/L 134 lbs/day 85% minimum removal		45 mg/L 201 lbs/day	
Total Suspended Solids ^b	30 mg/L 114 lbs/day 85% minimum removal		45 mg/L 171 lbs/day	
Fecal Coliform Bacteria	100/100 mL		200/100 mL	
pH ^c	Daily minimum is equal to or greater than 6.0 and the daily maximum is less than or equal to 8.5.			
Parameter	Average Monthly ^a		Maximum Daily ^d	
Total Residual Chlorine	9 µg/L		23 µg/L	
Total Ammonia (as NH ₃ -N) May-October	2.6 mg/L		7.43 mg/L 62 lb/day	
	Interim	Final	Interim	Final
Total Copper ^e	27 µg/L	11.13 µg/L	38.5 µg/L	16.24 µg/L

^a The average monthly and weekly effluent limitations are based on the arithmetic mean of the samples taken with the exception of fecal coliform, which is based on the geometric mean.

^b The average monthly effluent concentration for BOD₅ and Total Suspended Solids shall not exceed 30 mg/L or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.

^c Indicates the range of permitted values. When pH is continuously monitored, excursions between 5.0 and 6.5, or 8.5 and 10.0 shall not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.0 are violations. The instantaneous maximum and minimum pH shall be reported monthly.

^d The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant

discharged over the day. For other units of measurement, the daily discharge is the average measurement of the pollutant over the day.

° See compliance schedule in S1.B.

B. Compliance Schedule

Beginning on the effective date of this permit, the Permittee shall comply with the interim limits for copper. Within 48 months the effective date of this permit, but no later than March 1, 2007, the Permittee shall comply with the final water quality based limits for copper.

By March 31, 2004, the Permittee shall submit a status report on the progress being made toward meeting the final effluent water quality-based limits for copper. The report shall include data showing the trend of influent and effluent copper concentrations and shall describe further actions necessary to comply with the final water quality-based limits for copper by March 1, 2007.

C. Mixing Zone Descriptions

The maximum boundaries of the mixing zones are defined as follows:

Chronic Mixing Zone: 26.75 feet wide, extends 300 feet downstream and 100 feet upstream.

Acute Mixing Zone: 26.75 feet wide, extends 30 feet downstream and 10 feet upstream.

S2. MONITORING REQUIREMENTS

A. Monitoring Schedule⁽¹⁾

Category	Parameter	Units	Minimum Sampling Frequency	Sample Type
Wastewater Influent	BOD ₅	mg/L lb/day	2week	24-hour composite
Wastewater Influent	TSS	mg/L lb/day	2/week	24-hour composite
Wastewater Effluent	Flow	MGD	continuous ⁽²⁾	record daily totalizer
Wastewater Effluent	Temperature	°C	daily (7/week)	grab/meter
Wastewater Effluent	BOD ₅	mg/L lb/day	2/week	24-hour composite
Wastewater Effluent	TSS	mg/L lb/day	2/week	24-hour composite

Category	Parameter	Units	Minimum Sampling Frequency	Sample Type
Wastewater Effluent	Fecal Coliform Bacteria	cfu/100mL	2/week	grab
Wastewater Effluent	pH	Standard Units	daily (7/week)	grab/meter
Wastewater Effluent	Total Ammonia (as NH ₃ -N)	mg/L	2/week	grab
Wastewater Effluent	Dissolved Oxygen	mg/L	daily (7/week)	grab
Wastewater Effluent	Alkalinity (CaCO ₃)	mg/L	1/month	24-hour composite
Wastewater Effluent	Hardness (as CaCO ₃)	mg/L	1/month	grab
Wastewater Effluent	Total Copper	µg/L	1/month	24-hour composite
Wastewater Effluent	Priority Pollutant Scan	mg/L	yearly ⁽⁵⁾	24-hour composite
Gauge near plant	Rainfall	inches	daily (7/week)	24-hr measurement
Final Sludge	Priority Pollutant Scan	mg/L	yearly ⁽⁵⁾	grab

- ⁽¹⁾ For all monitoring, the permittee shall use methods that can achieve a method detection level (MDL) equal to 0.1 times the effluent limitation or the most sensitive EPA approved method, whichever is greater. If the analytical result for any sample is below the MDL, the permittee shall report "less than {numeric MDL}" on the DMR. For purposes of averaging results, the permittee shall use actual values for all values above the MDL and zero for values below the MDL.
- ⁽²⁾ Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance. Sampling shall be taken every four hours when continuous monitoring is not possible.
- ⁽³⁾ Quarterly is defined as: March, June, September, and December of each year.
- ⁽⁴⁾ Semi-annual is defined as June and December of each year.
- ⁽⁵⁾ Yearly is defined as March of each year.

B. Sampling and Analytical Procedures

Samples and measurements taken to meet the requirements of this permit shall be representative of the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets and maintenance-related conditions affecting effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit shall conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 Code of Federal Regulations (CFR) Part 136 or to the latest revision of *Standard Methods for the Examination of Water and Wastewater* (APHA), unless otherwise specified in this permit or approved in writing by the Department of Ecology (Department).

C. Flow Measurement

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the quantity of monitored flows. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements are consistent with the accepted industry standard for that type of device. Frequency of calibration shall be in conformance with manufacturer's recommendations and at a minimum frequency of at least one calibration per year. Calibration records shall be maintained for at least three years.

D. Laboratory Accreditation

All monitoring data required by the Department shall be prepared by a laboratory registered or accredited under the provisions of, *Accreditation of Environmental Laboratories*, Chapter 173-50 Washington Administrative Code (WAC). Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement. Conductivity and pH shall be accredited if the laboratory must otherwise be registered or accredited. The Department exempts crops, soils, and hazardous waste data from this requirement pending accreditation of laboratories for analysis of these media.

S3. REPORTING AND RECORDKEEPING REQUIREMENTS

The Permittee shall monitor and report in accordance with the following conditions. The falsification of information submitted to the Department shall constitute a violation of the terms and conditions of this permit.

A. Reporting

The first monitoring period begins on the effective date of the permit. Monitoring results shall be submitted monthly. Monitoring data obtained during each monitoring period shall be summarized, reported, and submitted on a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by the Department. DMR forms shall be received by the Department no later than the 15th day of the month following the completed monitoring period, unless otherwise specified in this permit. Priority pollutant analysis data shall be submitted no later than 45 days following the monitoring period. Unless otherwise specified, all toxicity test data shall be submitted within 60 days after the sample date. The report(s) shall be sent to the Department of Ecology, Southwest Regional Office, P.O. Box 47775, Olympia, Washington 98504-7775.

All laboratory reports providing data for organic and metal parameters shall include the following information: sampling date, sample location, date of analysis, parameter name,

CAS number, analytical method/ number, method detection limit (MDL), laboratory practical quantitation limit (PQL), reporting units, and concentration detected.

Discharge Monitoring Report forms must be submitted monthly whether or not the facility was discharging. If there was no discharge during a given monitoring period, submit the form as required with the words "no discharge" entered in place of the monitoring results.

B. Records Retention

The Permittee shall retain records of all monitoring information for a minimum of three years. Such information shall include all calibration and maintenance records and all original 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. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by the Department.

C. Recording of Results

For each measurement or sample taken, the Permittee shall record the following information: (1) the date, exact place, method, and time of sampling or measurement; (2) the individual who performed the sampling or measurement; (3) the dates the analyses were performed; (4) the individual who performed the analyses; (5) the analytical techniques or methods used; and (6) the results of all analyses.

D. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit using test procedures specified by Condition S2 of this permit, then the results of such monitoring shall be included in the calculation and reporting of the data submitted in the Permittee's DMR.

E. Noncompliance Notification

In the event the Permittee is unable to comply with any of the terms and conditions of this permit due to any cause, the Permittee shall:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance, correct the problem and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to the Department within 30 days after becoming aware of the violation.
2. Immediately notify the Department of the failure to comply.

3. Submit a detailed written report to the Department within 30 days (five days for upsets and bypasses), unless requested earlier by the Department. The report shall contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

S4. FACILITY LOADING

A. Design Criteria

Flows or waste loadings of the following design criteria for the permitted treatment facility shall not be exceeded:

Average flow for the maximum month: 1.0 MGD

BOD₅ loading for maximum month: 895 lb/day

TSS loading for maximum month: 760 lb/day

B. Plans for Maintaining Adequate Capacity

When the actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three consecutive months, or when the projected increases would reach design capacity within five years, whichever occurs first, the Permittee shall submit to the Department, a plan and a schedule for continuing to maintain capacity at the facility sufficient to achieve the effluent limitations and other conditions of this permit. This plan shall address any of the following actions or any others necessary to meet this objective.

1. Analysis of the present design including the introduction of any process modifications that would establish the ability of the existing facility to achieve the effluent limits and other requirements of this permit at specific levels in excess of the existing design criteria specified in paragraph A above.
2. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system.
3. Limitation on future sewer extensions or connections or additional waste loads.
4. Modification or expansion of facilities necessary to accommodate increased flow or waste load.
5. Reduction of industrial or commercial flows or waste loads to allow for increasing sanitary flow or waste load.

Engineering documents associated with the plan must meet the requirements of WAC 173-240-060, "Engineering Report," and be approved by the Department prior to any construction. The plan shall specify any contracts, ordinances, methods for financing, or other arrangements necessary to achieve this objective.

C. Duty to Mitigate

The Permittee is required to 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

D. Notification of New or Altered Sources

The Permittee shall submit written notice to the Department whenever any new discharge or a substantial change in volume or character of an existing discharge into the publicly owned treatment works (POTW) is proposed which: (1) would interfere with the operation of, or exceed the design capacity of, any portion of the POTW; (2) is not part of an approved general sewer plan or approved plans and specifications; or (3) would be subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act. This notice shall include an evaluation of the POTW's ability to adequately transport and treat the added flow and/or waste load, the quality and volume of effluent to be discharged to the POTW, and the anticipated impact on the Permittee's effluent [40 CFR 122.42(b)].

E. Infiltration and Inflow Evaluation

1. The Permittee shall conduct an infiltration and inflow evaluation. Refer to the U.S. EPA publication, *I/I Analysis and Project Certification*, available as Publication No. 97-03 at: Publications Office, Department of Ecology, P.O. Box 47600, Olympia, Washington 98504-7600. Plant monitoring records may be used to assess measurable infiltration and inflow.
2. A report shall be prepared which summarizes any measurable infiltration and inflow. If infiltration and inflow have increased by more than 15 percent from that found in the first report based on equivalent rainfall, the report shall contain a plan and a schedule for: (1) locating the sources of infiltration and inflow; and (2) correcting the problem.
3. The report covering the previous year from November 1, through October 31, shall be submitted by January 15, 2004, and annually thereafter.

F. Waste load Assessment

The Permittee shall conduct an annual assessment (November 1, through October 31) of their flow and waste load and submit a report to the Department by January 15, 2004, and annually thereafter. The report shall contain the following: an indication of compliance or noncompliance with the permit effluent limitations; a comparison between the existing and design monthly average dry weather and wet weather flows, peak flows, BOD, and total suspended solids loadings; and (except for the first report) the percentage increase in these parameters since the last annual report. The report shall also state the present and design population or population equivalent, projected population growth rate, and the

estimated date upon which the design capacity is projected to be reached, according to the most restrictive of the parameters above. The interval for review and reporting may be modified if the Department determines that a different frequency is sufficient.

S5. OPERATION AND MAINTENANCE

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed to achieve compliance with the terms and 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, which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

A. Certified Operator

An operator certified for at least a Class II plant by the state of Washington shall be in responsible charge of the day-to-day operation of the wastewater treatment plant. An operator certified for at least a Class I plant shall be in charge during all regularly scheduled shifts.

B. O & M Program

The Permittee shall institute an adequate operation and maintenance program for their entire sewage system. Maintenance records shall be maintained on all major electrical and mechanical components of the treatment plant, as well as the sewage system and pumping stations. Such records shall clearly specify the frequency and type of maintenance recommended by the manufacturer and shall show the frequency and type of maintenance performed. These maintenance records shall be available for inspection at all times.

C. Short-term Reduction

If a Permittee contemplates a reduction in the level of treatment that would cause a violation of permit discharge limitations on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee shall give written notification to the Department, if possible, 30 days prior to such activities, detailing the reasons for, length of time of, and the potential effects of the reduced level of treatment. This notification does not relieve the Permittee of their obligations under this permit.

D. Electrical Power Failure

The Permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of this permit during electrical power failure at the treatment plant and/or sewage lift stations either by means of alternate power sources, standby generator, or retention of inadequately treated wastes. The Permittee shall maintain Reliability Class II (EPA 430-99-74-001) at the wastewater treatment plant, which requires primary sedimentation and disinfection.

E. Prevent Connection of Inflow

The Permittee shall strictly enforce their sewer ordinances and not allow the connection of inflow (roof drains, foundation drains, etc.) to the sanitary sewer system.

F. Bypass Procedures

Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited, and the Department may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, or 3) is applicable.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health as determined by the Department prior to the bypass. The Permittee shall submit prior notice, if possible at least 10 days before the date of the bypass.

2. Bypass which is unavoidable, unanticipated and results in noncompliance of this permit.

This bypass is permitted only if:

- a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.
 - b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.
 - c. The Department is properly notified of the bypass as required in Condition S3E of this permit.
3. Bypass which is anticipated and has the potential to result in noncompliance of this permit

The Permittee shall notify the Department at least 30 days before the planned date of bypass. The notice shall contain: (1) a description of the bypass and its cause; (2) an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing; (3) a cost-effectiveness analysis of alternatives

including comparative resource damage assessment; (4) the minimum and maximum duration of bypass under each alternative; (5) a recommendation as to the preferred alternative for conducting the bypass; (6) the projected date of bypass initiation; (7) a statement of compliance with State Environmental Policy Act (SEPA); (8) a request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated; and (9) steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above shall be considered during preparation of the engineering report or facilities plan and plans and specifications and shall be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

The Department will consider the following prior to issuing an administrative order for this type bypass:

- a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.
- b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.
- c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, the Department will approve or deny the request. The public shall be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by the Department under Revised Code of Washington (RCW) 90.48.120.

G. Operations and Maintenance Manual

The approved Operations and Maintenance (O&M) Manual shall be kept available at the treatment plant and all operators shall follow the instructions and procedures of this manual. The O&M Manual shall be reviewed by the Permittee at least annually and substantial changes or updates shall be submitted to the Department whenever they are incorporated into the manual

S6. PRETREATMENT

A. General Requirements

The Permittee shall work with the Department to ensure that all commercial and industrial users of the POTW are in compliance with the pretreatment regulations promulgated in 40 CFR Part 403 and any additional regulations that may be promulgated under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act.

B. Wastewater Discharge Permit Required

The Permittee shall not allow significant industrial users (SIUs) to discharge wastewater to the Permittee's sewerage system until such user has received a wastewater discharge permit from the Department in accordance with Chapter 90.48 RCW and Chapter 173-216 WAC, as amended.

C. Identification and Reporting of Existing, New, and Proposed Industrial Users

1. The Permittee shall take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging or proposing to discharge to the Permittee's sewerage system (see Appendix B of Fact Sheet for definitions).
2. Within 30 days of becoming aware of an unpermitted existing, new, or proposed industrial user who may be an SIU, the Permittee shall notify such user by registered mail that, if classified as an SIU, they shall be required to apply to the Department and obtain a state waste discharge permit. A copy of this notification letter shall also be sent to the Department within this same 30-day period.
3. The Permittee shall also notify all PSIUs, as they are identified, that if their classification should change to an SIU, they shall be required to apply to the Department for a state waste discharge permit within 30 days of such change.

D. Industrial User Survey

The Permittee shall complete and submit to the Department an Industrial User Survey listing all SIUs and PSIUs discharging to the POTW. The survey shall be received by the Department by June 30, 2006. At a minimum, the list of SIUs and PSIUs shall be developed by means of a telephone book search, a water utility billing records search, and a physical reconnaissance of the service area. Information on PSIUs shall at least include: the business name, telephone number, address, description of the industrial process(es), and the known wastewater volumes and characteristics. For assistance with the development of the Industrial User Survey, the Permittee shall refer to the Department's guidance document entitled "Performing an Industrial User Survey."

E. Duty to Enforce Discharge Prohibitions

1. In accordance with 40 CFR 403.5(a), the Permittee shall not authorize or knowingly allow the discharge of any pollutants into its POTW which cause pass through or interference, or which otherwise violates general or specific discharge prohibitions contained in 40 CFR Part 403.5 or WAC-173-216-060.

2. The Permittee shall not authorize or knowingly allow the introduction of any of the following into their treatment works:
 - a. Pollutants which create a fire or explosion hazard in the POTW (including, but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21).
 - b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, or greater than 11.0 standard units, unless the works are specifically designed to accommodate such discharges.
 - c. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.
 - d. Any pollutant, including oxygen demanding pollutants, (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.
 - e. Petroleum oil, nonbiodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.
 - f. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity which may cause acute worker health and safety problems.
 - g. Heat in amounts that will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities such that the temperature at the POTW headworks exceeds 40°C (104°F) unless the Department, upon request of the Permittee, approves, in writing, alternate temperature limits.
 - h. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.
 - i. Wastewaters prohibited to be discharged to the POTW by the Dangerous Waste Regulations (Chapter 173-303 WAC), unless authorized under the Domestic Sewage Exclusion (WAC 173-303-071).
3. All of the following are prohibited from discharge to the POTW unless approved in writing by the Department under extraordinary circumstances (such as a lack of direct discharge alternatives due to combined sewer service or the need to augment sewage flows due to septic conditions):
 - a. Noncontact cooling water in significant volumes.
 - b. Stormwater, and other direct inflow sources.

- c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment, or would not be afforded a significant degree of treatment by the system.
4. The Permittee shall notify the Department if any industrial user violates the prohibitions listed in this section.

S7. RESIDUAL SOLIDS

Residual solids include screenings, grit, scum, primary sludge, waste activated sludge, and other solid waste. The Permittee shall store and handle all residual solids in such a manner so as to prevent their entry into state ground or surface waters. The Permittee shall not discharge leachate from residual solids to state surface or ground waters.

S8. RECEIVING WATER STUDY

The Permittee shall collect receiving water information necessary to determine if the effluent has a reasonable potential to cause a violation of the water quality standards. If reasonable potential exists the Department will use this information to calculate effluent limits. All sampling and analysis shall be conducted in accordance with the guidelines given in *Guidelines and Specifications for Preparing Quality Assurance Project Plans*, Ecology Publication 91-16. The Permittee shall submit a sampling and quality assurance plan for Department review and approval within 180 days of the effective date of this permit.

The Permittee shall sample and analyze the receiving water for BOD₅, Total Suspended Solids, Dissolved Oxygen, Alkalinity, Total Ammonia, Total Kjeldahl Nitrogen, Total Phosphorus, Ortho Phosphorus, Hardness, Temperature, pH, Mercury, and Arsenic. The following metals shall be analyzed for both total recoverable and dissolved: Cadmium, Chromium, Copper, Lead, Nickel, Silver, and Zinc. The time of sampling shall be as close as possible to the time of critical period. The Permittee shall follow the clean sampling techniques (Method 1669: Sampling Ambient Water for Trace Metals at Environmental Protection Agency (EPA) Water Quality Criteria Levels, EPA Publication No. 821-R-95-034, April 1995). The sampling station accuracy requirements are ± 20 meters. The receiving water sampling location should be outside the zone of influence of the effluent. The Department considers ten receiving water samples to be the optimal data set and four to be the minimum, for determining reasonable potential to cause a violation of the water quality standards. All chemical analysis shall be conducted according to methods given in 40 CFR 136 and shall have the following detection levels:

POLLUTANT PARAMETER	DETECTION LIMIT REQUIRED
Copper	1.0 µg/L
Lead	1.0 µg/L
Nickel	1.0 µg/L
Chromium	1.0 µg/L
Zinc	4.0 µg/L

Cadmium	0.1 µg/L
Silver	0.2 µg/L
Mercury	0.2 µg/L
Arsenic	1.0 µg/L

Any subsequent sampling and analysis shall also meet these requirements. The Permittee may conduct a cooperative receiving water study with other National Pollutant Discharge Elimination System (NPDES) Permittees discharging in the same vicinity. The Permittee shall submit the results of the study to the Department within 90 days of completing the effluent and receiving water studies.

S9. ACUTE TOXICITY

A. Testing Requirements

The Permittee shall test final effluent once in the last summer and once in the last winter prior to submission of the application for permit renewal. The two species listed below shall be used on each sample and the results submitted to the Department as a part of the permit renewal application process. The Permittee shall conduct acute toxicity testing on a series of five concentrations of effluent and a control in order to be able to determine appropriate point estimates and an NOEC. The percent survival in 100 percent effluent shall also be reported.

Acute toxicity tests shall be conducted with the following species and protocols:

- 1) Fathead minnow, *Pimephales promelas* (96 hour static-renewal test, method: EPA/600/4-90/027F)
- 2) Daphnid, *Ceriodaphnia dubia*, *Daphnia pulex*, or *Daphnia magna* (48 hour static test, method: EPA/600/4-90/027F).

B. Sampling and Reporting Requirements

1. All reports for effluent characterization or compliance monitoring shall be submitted in accordance with the most recent version of Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* in regards to format and content. Reports shall contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data on floppy disk for electronic entry into the Department's database, then the Permittee shall send the disk to the Department along with the test report, bench sheets, and reference toxicant results.
2. Testing shall be conducted on 24-hour composite effluent samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.

3. All samples and test solutions for toxicity testing shall have water quality measurements as specified in Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* or most recent version thereof.
4. All toxicity tests shall meet quality assurance criteria and test conditions in the most recent versions of the EPA manual listed in subsection A. and the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If test results are determined to be invalid or anomalous by the Department, testing shall be repeated with freshly collected effluent.
5. Control water and dilution water shall be laboratory water meeting the requirements of the EPA manual listed in subsection A or pristine natural water of sufficient quality for good control performance.
6. The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.
7. The Permittee may choose to conduct a full dilution series test during compliance monitoring in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the ACEC.
8. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing and do not comply with the acute statistical power standard of 29 percent as defined in WAC 173-205-020 must be repeated on a fresh sample with an increased number of replicates to increase the power.

S10. CHRONIC TOXICITY

A. Testing Requirements

The Permittee shall test final effluent once in the last summer and once in the last winter prior to submission of the application for permit renewal. All of the chronic toxicity tests listed below shall be conducted on each sample. The results of this chronic toxicity testing shall be submitted to the Department as a part of the permit renewal application process.

The Permittee shall conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control in order to be able to determine appropriate point estimates and an NOEC. This series of dilutions shall include the acute critical effluent concentration (ACEC). The ACEC equals 38 percent effluent. The Permittee shall compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.

Chronic toxicity tests shall be conducted with the following species and the most recent version of the following protocols:

Freshwater Chronic Toxicity Test Species		Method
Fathead minnow	<i>Pimephales promelas</i>	EPA/600/4-91/002
Water flea	<i>Ceriodaphnia dubia</i>	EPA/600/4-91/002

B. Sampling and Reporting Requirements

1. All reports for effluent characterization or compliance monitoring shall be submitted in accordance with the most recent version of Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* in regards to format and content. Reports shall contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data on floppy disk for electronic entry into the Department's database, then the Permittee shall send the disk to the Department along with the test report, bench sheets, and reference toxicant results.
2. Testing shall be conducted on 24-hour composite effluent samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.
3. All samples and test solutions for toxicity testing shall have water quality measurements as specified in Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* or most recent version thereof.
4. All toxicity tests shall meet quality assurance criteria and test conditions in the most recent versions of the EPA manual listed in subsection A. and the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If test results are determined to be invalid or anomalous by the Department, testing shall be repeated with freshly collected effluent.
5. Control water and dilution water shall be laboratory water meeting the requirements of the EPA manual listed in subsection A or pristine natural water of sufficient quality for good control performance.
6. The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.
7. The Permittee may choose to conduct a full dilution series test in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the ACEC and the CCEC. The ACEC and CCEC may either substitute for the effluent concentration that is closest to it in the dilution series or be an extra effluent concentration.

8. All whole effluent toxicity tests that involve hypothesis testing and do not comply with the chronic statistical power standard of 39 percent as defined in WAC 173-205-020 must be repeated on a fresh sample with an increased number of replicates to increase the power.

S11. OUTFALL EVALUATION

The Permittee shall inspect the outfall line and diffuser at least once a month to document its integrity and continued function. The inspection shall be noted on the monthly Discharge Monitoring Report submitted to the Department.

GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

All applications, reports, or information submitted to the Department shall be signed and certified.

- A. All permit applications shall be signed by either a principal executive officer or a ranking elected official.
- B. All reports required by this permit and other information requested by the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - 1. The authorization is made in writing by a person described above and submitted to the Department.
 - 2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
- C. Changes to authorization. If an authorization under paragraph B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph B.2 above must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.
- D. Certification. Any person signing a document under this section shall make the following certification:

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

G2. RIGHT OF INSPECTION AND ENTRY

The Permittee shall allow an authorized representative of the Department, upon the presentation of credentials and such other documents as may be required by law:

- A. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.
- B. To have access to and copy - at reasonable times and at reasonable cost - any records required to be kept under the terms and conditions of this permit.
- C. To inspect - at reasonable times - any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.
- D. To sample or monitor - at reasonable times - any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G3. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the permittee) or upon the Department's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR 122.62, 122.64 or WAC 173-220-150 according to the procedures of 40 CFR 124.5.

- A. The following are causes for terminating this permit during its term, or for denying a permit renewal application:
 - 1. Violation of any permit term or condition.
 - 2. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.
 - 3. A material change in quantity or type of waste disposal.
 - 4. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination [40 CFR Part 122.64(3)].
 - 5. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit [40 CFR Part 122.64(4)].
 - 6. Nonpayment of fees assessed pursuant to RCW 90.48.465.
 - 7. Failure or refusal of the permittee to allow entry as required in RCW 90.48.090.
- B. The following are causes for modification but not revocation and reissuance except when the permittee requests or agrees:
 - 1. A material change in the condition of the waters of the state.
 - 2. New information not available at the time of permit issuance that would have justified the application of different permit conditions.

3. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.
 4. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.
 5. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.
 6. The Department has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.
 7. Incorporation of an approved local pretreatment program into a municipality's permit.
- C. The following are causes for modification or alternatively revocation and reissuance:
1. Cause exists for termination for reasons listed in A1 through A7 of this section, and the Department determines that modification or revocation and reissuance is appropriate.
 2. The Department has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G8) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new permittee.

G4. REPORTING A CAUSE FOR MODIFICATION

The Permittee shall submit a new application, or a supplement to the previous application, along with required engineering plans and reports whenever a material change to the facility or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application shall be submitted at least 60 days prior to any proposed changes. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G5. PLAN REVIEW REQUIRED

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications shall be submitted to the Department for approval in accordance with Chapter 173-240 WAC. Engineering reports, plans, and specifications shall be submitted at least 180 days prior to the planned start of construction unless a shorter time is approved by the Department. Facilities shall be constructed and operated in accordance with the approved plans.

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit shall be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. DUTY TO REAPPLY

The Permittee shall apply for permit renewal at least 180 days prior to the specified expiration date of this permit.

G8. TRANSFER OF THIS PERMIT

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Department.

A. Transfers by Modification

Except as provided in paragraph (B) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

B. Automatic Transfers

This permit may be automatically transferred to a new Permittee if:

1. The Permittee notifies the Department at least 30 days in advance of the proposed transfer date.
2. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.
3. The Department does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G9. REDUCED PRODUCTION FOR COMPLIANCE

The Permittee, in order to maintain compliance with its permit, shall control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G10. REMOVED SUBSTANCES

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall not be resuspended or reintroduced to the final effluent stream for discharge to state waters.

G11. DUTY TO PROVIDE INFORMATION

The Permittee shall submit to the Department, within a reasonable time, all information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee shall also submit to the Department upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G12. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G13. ADDITIONAL MONITORING

The Department may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G14. PAYMENT OF FEES

The Permittee shall submit payment of fees associated with this permit as assessed by the Department.

G15. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to \$10,000 and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit shall incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to \$10,000 for every such violation. Each and every such violation shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G16. UPSET

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 operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as

required in Condition S3.E; and 4) the Permittee complied with any remedial measures required under S5 of this permit.

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

G17. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G18. DUTY TO COMPLY

The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G19. TOXIC POLLUTANTS

The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G20. PENALTIES FOR TAMPERING

The 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 shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this Condition, punishment shall be a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or by both.

G21. REPORTING PLANNED CHANGES

The Permittee shall, as soon as possible, give notice to the Department of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in: 1) the permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b); 2) a significant change in the nature or an increase in quantity of pollutants discharged; or 3) a significant change in the Permittee's sludge use or disposal practices. Following such notice, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation of the terms and conditions of this permit.

G22. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee shall give advance notice to the Department by submission of a new application or supplement thereto at least 180 days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions.

Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, shall be scheduled during non-critical water quality periods and carried out in a manner approved by the Department.

G23. REPORTING OTHER INFORMATION

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Department, it shall promptly submit such facts or information.

G24. REPORTING REQUIREMENTS APPLICABLE TO EXISTING MANUFACTURING, COMMERCIAL, MINING, AND SILVICULTURAL DISCHARGERS

The Permittee belonging to the categories of existing manufacturing, commercial, mining, or silviculture must notify the Department as soon as they know or have reason to believe:

- A. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels:"
 - 1. One hundred micrograms per liter (100 µg/l).
 - 2. Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony.
 - 3. Five times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
 - 4. The level established by the Director in accordance with 40 CFR 122.44(f).
- B. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels:"
 - 1. Five hundred micrograms per liter (500µg/L).
 - 2. One milligram per liter (1 mg/L).
 - 3. Ten times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
 - 4. The level established by the Director in accordance with 40 CFR 122.44(f).

G25. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

FACT SHEET FOR NPDES PERMIT WA0023361
CITY OF BUCKLEY WASTEWATER TREATMENT PLANT

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) permits, which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 Revised Code of Washington (RCW) defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant:	City of Buckley P.O. Box 1960 Buckley, WA 98321
Facility Name and Address:	Buckley Wastewater Treatment Facility 600 Hatch Avenue Buckley, Washington 98321 Pierce County
Type of Treatment:	Oxidation Ditch Secondary Treatment with Chlorine Disinfection
Discharge Location:	White River at Buckley, River Mile 21.8 Latitude: 47° 10' 19" N Longitude: 122° 02' 08" W.
Water Body ID Number:	WA-10-1040

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

Buckley's wastewater treatment plant was originally constructed in 1952 with a design flow of 300,000 gallons per day. The 1952 facility contained a grit removal chamber, a mechanical shredder, Imhoff tank, chlorination facilities, four sludge drying beds, and an 18-inch cast iron effluent line. In 1980 the plant was upgraded to the present facility to achieve secondary treatment.

COLLECTION SYSTEM STATUS

The sewer collection system for the City of Buckley was originally built in the early 1930s as a combined storm and sanitary sewer system. Over the years, extensions and sewer separations have occurred resulting in a total pipeline length of approximately 85,705 feet. The older gravity sewer mains consist of clay pipes with mortared bell-spigot type joints. More recent construction is primarily 8- and 10-inch concrete and PVC pipe with rubber joints. However, less than 1/3 of the system has been installed with this type of construction.

The City's existing sanitary sewer system consist of approximately 75,105 lineal feet of gravity sewers , 10,600 lineal feet of 6-inch or 4-inch force mains, and 273 manholes. The system is more or less divided into two parts by State Route 410. Flow on the southeast side of the highway is transported under SR 410 at Wheeler and Park Avenue, and conveyed by gravity into the wastewater treatment plant north of Park Avenue. Flows northeast of SR 410 travel north to the main trunk line on Park Avenue. A small volume of flow is conveyed across SR 410 immediately west of the intersection of SR 410 and SR 165. The sewer system currently only serves the core area of the City of Buckley.

The collection system has considerable infiltration and inflow which hydraulically overloads the wastewater treatment plant during storm events. There are no known bypasses or overflow points in the City of Buckley's sewer collection system. A sewer system rehabilitation program was first developed from an infiltration/inflow (I/I) study in 1973. A second I/I study was completed in 1975. A third I/I study conducted in 1992 and completed in 1994 and resulted in Buckley replacing part of it sanitary sewer collection system. The goal of this continued work on the collection system is to reduce infiltration and inflow by at least 45 percent. As of late 2001, there is no clear indication from wastewater treatment plant flow data that I/I has been reduced. Work continues on the collection system and flows continue to be monitored to determine the effectiveness of the sanitary sewer collection rehabilitation program.

TREATMENT PROCESSES

The existing wastewater treatment facility for the City of Buckley uses an extended aeration activated sludge system to treat the City's wastewater with chlorine disinfection and dechlorination prior to discharge to the White River. The treatment system consists of the following unit processes:

Flow enters the plant through an 18-inch ductile iron pipe into the influent channel. The width of the influent channel is 1-foot 3-inches with a hydraulic capacity of 2.4 MGD and a maximum capacity of 7.0 MGD. Flow passes through an aerated grit chamber where settled grit is removed through an air lift pump to a grit washer and then disposed of in a dumpster. Flow then passes through a Hycor in-channel fine screen with ¼ inch openings, which was added in 1999. Screenings are transported into a washer compactor and then discharged into a dumpster for disposal with other solid waste.

Downstream of the fine screen flow is split between two oxidation ditches to achieve secondary treatment. Each oxidation ditch has a volume of 422,000 gallons and a side water depth of 10.5 feet. Flow from the oxidation ditches flow into two separate rectangular secondary traveling bridge clarifiers

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each with an effective settling area of 810 square feet and a side water depth of 10 feet. The traveling bridge assembly spans the clarifier unit and moves back and forth along the length of the clarifier controlling the vacuum sludge and scum removal system. Flow from the two traveling bridge clarifiers passes through a Parshall Flume for effluent flow measurement with a range of flows from 0.03 MGD up to 1.87 MGD. Flow is then split between two identical chlorine contact basins isolated by a 16 inch diameter sluice gate. The flow is disinfected with chlorine gas and then dechlorinated with sulfur dioxide gas prior to discharge to the White River.

Waste sludge is pumped to two aerobic sludge holding tanks, each 89,670 gallons, a side water depth of 12 feet, and fitted with fine bubble diffusers. These aerobic sludge holding tanks were added in 1998.

The publicly owned treatment works (POTW) is classified as a Class 2 facility and is operated by a staff of two certified operators. The operator in responsible charge is certified at the Class 2 level.

DISCHARGE OUTFALL

The outfall line consists of 1,400 lineal feet of 14-inch ductile iron pipe and five manholes. The outfall line passes under the Puget Power Flume and due to the dynamic nature of the channel of the White River Buckley's outfall is no longer in the White River but discharges near the bank of the White River in a channel that parallels the course of the of the river during low flows and merges with the river downstream at a bend in the river.

The City of Buckley's permitted outfall is located on the White River at river mile 21.8. Upstream of the discharge at river mile 24.3, a large portion of the White River flow is diverted through Lake Tapps for power generation and then returned to the White River at river mile 3.6. A fish screen return flow of 20 cfs is returned to the natural river channel at river mile 21 just below the City of Buckley's WWTF outfall. The City of Enumclaw's permitted outfall is located upstream at river mile 23.1.

The instream flow of the natural channel of the White River is regulated by the Federal Energy Regulatory Commission (FERC). Flows may not be diverted into Lake Tapps such that flows in the natural channel of the White River fall below the following schedule as measured at USGS 12100000 located below Bosie Creek at river mile 23.1:

Interim Flows as of July 2001 (below Boise Creek at USGS 12100000)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
cfs	130	200	275	350	350	250	250	250	275	250	130	130

There are several proposals by FERC and the National Marine Fisheries Service (NMFS) to change these interim flows so that higher flows would be maintained in the natural channel of the White River for salmonid passage.

RESIDUAL SOLIDS

Screenings and grit are taken to the landfill for disposal. Sludge is dried in drying beds and composted onsite for use as a soil amendment and topsoil. Excess sludge is taken to South Sound Soils in Tenino. Sludge volume is approximately 70 dry weight tons per year. Sludge analysis indicates that metals loadings are well below the loadings allowable (mg/kg on dry weight basis) for land application under the federal sludge regulations, 40 Code of Federal Regulations (CFR) 503. Composting is an acceptable method for pathogen and vector attraction reduction.

PERMIT STATUS

The previous permit for this facility was issued on July 28, 1994. The previous permit placed effluent limitations on five-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, Total Residual Chlorine, Total Ammonia, Copper, Mercury, and Zinc.

An application for permit renewal was submitted to the Department on February 10, 1999. The permit has been administratively extended until the present time.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

During the history of the previous permit, information from Discharge Monitoring Reports (DMRs) submitted to the Department indicate the following permit violations:

BOD ₅ :	There have been eight monthly average and 15 weekly average loading violations, three percent removal violations, and one monthly average and two average weekly concentration violations.
TSS:	There were 11 monthly average and 18 weekly average loading violations, and three percent removal violations.
F. Coliform:	There was one fecal coliform weekly geometric mean violation.
TRC:	There was one maximum daily total residual chlorine concentration violation.
Copper:	There were eight Total Copper daily maximum concentration violations.
Zinc:	There was one Total Zinc daily maximum concentration violation.

The City of Buckley continues to work on infiltration and inflow in their collection system to reduce the peak flows causing their BOD₅ and TSS loading violations. Buckley is also in the process of upgrading their wastewater facility to include biological and chemical removal of phosphorus which along with corrosion control on the water supply for the City will reduce the amount of copper in their wastewater discharges.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Concentration or Rate</u>
Flow	0.4 MGD ADWF – 1.0 MGD AFMM
BOD ₅	7.75 mg/L annual average – 13.4 mg/L weekly average
TSS	6.6 mg/L annual average – 11.4 mg/L weekly average
Fecal Coliform Bacteria	3.04 cfu annual average – 16.5 cfu weekly average
pH	6.36 s.u. – 7.51 s.u.
Total Residual Chlorine	0.026 mg/L annual average – 2.0 mg/L maximum
Total Ammonia as N (Summer)	0.64 mg/L annual average – 1.78 mg/L maximum monthly average
Total Ammonia as N (Winter)	1.68 mg/L annual average – 3.88 mg/L maximum monthly average
Temperature (Summer)	17.7°C avg., 20.3°C max month avg., 14.8°C min. month avg.
Temperature (Winter)	11.95°C avg., 13.9°C max month avg., 10.3°C min. month avg.
Total Copper	13.5 µg/L average, 70 µg/L maximum value

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Total Mercury 0.0 µg/L
Total Zinc 45.4 µg/L average, 120 µg/L maximum value
Hardness 47 mg/L

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from City of Buckley Facility Plan Supplemental Report titled "Wastewater Treatment Plant Capacity Analysis", prepared by Gray and Osborne, Inc., October 1996, revised March 1997:

Table 2: Design Standards for City of Buckley WWTP.

Parameter	Design Quantity
Monthly average flow (max. month)	1.0 MGD
Monthly average dry weather flow	0.45 MGD
Peak daily flow	1.65 MGD
Instantaneous peak flow	2.7 MGD
BOD ₅ influent loading	895 lb./day
TSS influent loading	760 lb./day
Design population equivalent	4,475
BOD ₅ /TSS Removal Efficiencies	85% minimum

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH	Lower bound to 6.0 Standard Units
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The existing permit has a chlorine limit of 9 µg/L monthly average and 23 µg/L daily maximum and the facility is able to comply with it. The proposed permit includes the same limit.

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

The BOD₅ monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loading (895 lbs/day) x 0.15 = 134 lbs/day. The BOD₅ weekly average effluent mass loading is calculated as 1.5 x monthly loading = 201 lbs/day. The Puyallup River TMDL set the BOD₅ weekly average mass loading for Buckley at 280 lbs/day which corresponds to a monthly average mass loading of 187 lbs/day. The mass loadings set by the Puyallup TMDL were not as limiting as the influent design loadings. The more limiting influent design loadings control and will be incorporated into the NPDES permit.

The TSS monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loading (760 lbs/day) x 0.15 = 114 lbs/day. The TSS weekly average effluent mass loading is calculated as 1.5 x monthly loading = 171 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

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The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The Buckley wastewater facility discharges to the White River at RM 21.8 which is designated as a Class A receiving water in the vicinity of the outfall. Upstream of the Buckley outfall at RM 23.1 is the City of Enumclaw's wastewater outfall. Upstream at RM 24.3, a large portion of the White River flow is diverted through Lake Tapps for power generation and then returned to the White River at RM 3.6. The instream flow of the natural White River channel is currently maintained above 130 cfs at USGS 12100000 located below Bosie Creek at river mile 23.1 by an agreement between Puget Sound Power and Light Company and the Muckleshoot Tribe. There is also a fish screen return flow of 20 cfs returned to the natural river channel below the City of Buckley's outfall.

Characteristic uses include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	Upper bound to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

Chronic Mixing Zone: 26.75 feet wide, extends 300 feet downstream and 100 feet upstream.

Acute Mixing Zone: 26.75 feet wide, extends 30 feet downstream and 10 feet upstream.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of continuous stream flow and effluent flow data and the RIVPLUM5 model. The dilution factors have been determined to be (from Appendix C):

	Acute	Chronic
Aquatic Life	2.62	11.35
Human Health, Carcinogen		59.6
Human Health, Non-carcinogen		46.6

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

Section 305(b) of the Clean Water Act requires the state to assess the quality of surface waters and to identify impairment of designated beneficial uses pursuant to the state water quality standards (WAC 173-201A). The most recent assessment indicates that the White River (RM 0 to 29.6) occasionally exceeds the fecal coliform criterion. The high fecal coliform count occurs after rainfall events and appears to be related to storm water runoff.

In addition, the upper bound of the water quality criteria for pH (6.5 to 8.5 standard units) is violated in the natural White River channel between the diversion to and outflow from Lake Tapps. Water quality toxicity criteria for ammonia are also seasonally affected by high temperature and pH. Conditions in the White River channel appear to be most limiting for ammonia between May and October.

For aquatic life protection, the critical condition for the White River is the seven day average low river flow with a recurrence interval of ten years (7Q10). Ambient data at critical conditions in the vicinity of the Buckley outfall was taken from the TMDL study which considered both historical data and an intensive monitoring study conducted in June, 1993. The ambient data used for this permit include the most restrictive values in the immediate vicinity of the Buckley outfall (see Appendix C) as follows:

Parameter	Value used
7Q10 low flow	130 cfs
Velocity	1.45 ft/sec
Depth	0.82 feet
Width	107 feet
Roughness (Manning)	n=0.0777
Slope	6.6 E-03 (0.378 degrees)
Temperature	1.5 °C – 12.7 °C
pH (high)	8.1
Dissolved Oxygen	11.32 mg/L
Total Ammonia-N	0.013 mgN/L
Fecal Coliform	42/100 mL dry weather, 260/100 mL wet weather (>1300/100 mL storm related)

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Turbidity	27 NTU
Alkalinity	24.25 mg/L as CaCO ₃
Hardness	25.35 mg/L as CaCO ₃
Metals	Ambient metals concentrations shall be determined from the receiving water study. For reasonable potential determining ambient metals were assumed to be zero due to the lack of sufficient data.
All Other Metals	0.0 (below detection limits)

The critical river conditions for human health protection are defined in EPA's "National Toxics Rule" (NTR, 57 FR 60848, December 1992) as the 30Q5 low flow (30-day average flows with a recurrence interval of five years) for noncarcinogens and the harmonic mean flow for carcinogens. The following summary statistics were estimated using the 14 complete annual periods between November 7, 1986, and December 31, 2001:

**FERC Interim Flows
as of July 2001
@ USGS 12100000**

Harmonic mean flow 303 cfs

30Q5 low flow 147 cfs

BOD₅--Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD₅ was placed in the permit.

The impact of BOD on the receiving water was modeled using Streeter-Phelps analysis of critical dissolved oxygen sag at critical condition and with the technology-based effluent limitation for BOD₅ described under "Technology-Based Effluent Limitations" above. The calculations used to determine dissolved oxygen impacts are shown in Appendix C.

Temperature -- The impact of temperature on the receiving water was modeled using a simple mixing analysis. The input variables were dilution factor of 11.35, upstream temperature 13.1°C, and effluent temperature 20.3°C. This simple mixing analysis resulted in a calculated mixed temperature of 13.73°C and an incremental increase of the ambient water temperature of 0.63°C. The water quality standards for temperature in a class A (excellent) receiving water are not to exceed 18°C and a maximum incremental temperature increase of $t = 28 / (13.1^\circ\text{C} + 7) = 1.39^\circ\text{C}$.

There is no predicted violation of the temperature standard so no permit limit for temperature will be placed in the permit.

pH-- There is currently a TMDL for pH on the White River due to excursions of background pH that sometimes reach 9.3 s.u. downstream of the outfall, therefore the upper bound water quality criteria of 8.5 s.u. and the lower bound technology based limit of 6.0 s.u. was placed in the permit to be protective of the pH criterion.

Fecal coliform-- Since background levels of fecal coliform were found to be above the water quality criterion for fecal coliform the water quality criteria of 100 organisms/100 ml was placed in the permit to be protective of the fecal coliform criterion instead of the technology-based limitation.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-

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based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, copper, and, zinc. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for chlorine, ammonia, copper, and, zinc to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The parameters used in the critical condition modeling are as follows: acute dilution factor 2.62, chronic dilution factor 11.35, May-October receiving water temperature 15.2°C, November-April receiving water temperature 8.4°C, effluent hardness 47 mgCaCO₃/L, receiving water hardness 23.3 mg CaCO₃/L, receiving water total ammonia 0.02 mg/L May-October and 0.04 mg/L November to April, receiving water copper 2.92 µg/L, receiving water lead 1.2 µg/L, receiving water nickel 0.0 µg/L, and receiving water zinc 15 µg/L.

There was very little ambient data available for ammonia and heavy metals. The Permittee is required in section S8 of the proposed permit to perform a receiving water study during the next permit term. This information may result in a permit modification or limits in the next renewal.

Total residual chlorine showed no reasonable potential to violate standards so the effluent limits from the previous permit were placed in the permit for this parameter. Ammonia-N showed no reasonable potential to violate standards, however, effluent limits for May-October Ammonia-N were back calculated from the daily maximum mass loading set by the Puyallup TMDL. No effluent limits for November-April Ammonia-N were necessary. Effluent limits were derived for total copper, which were determined to have a reasonable potential to cause a violation of the Water Quality Standards. Effluent limits for copper were calculated using methods from EPA, 1991 as shown in Appendix C.

The resultant effluent limits are as follows:

Parameter	Average Monthly	Maximum Daily
Total Residual Chlorine	9 µg/L	23 µg/L
Total Ammonia (as NH ₃ -N) May-October	2.6 mg/L	7.43 mg/L 62 lb/day
Total Copper interim performance based	27 µg/L	38.5 µg/L
Total Copper final water quality based	11.13 µg/L	16.24 µg/L

The proposed permit contains a compliance schedule for meeting the water quality-based limits for copper. The City is currently installing a corrosion control system on the water supply to comply with Department of Health requirements for copper in the City of Buckley drinking water. This system should be completed in June 2003 and we should be seeing results in the wastewater effluent within six months. The proposed permit contains interim limits for copper, as required by Chapter 173-201A WAC, that are based on existing demonstrated performance. The permit also contains water quality derived final permit limits for copper.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific

basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water acute toxicity, and the Permittee will not be given an acute WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water chronic toxicity, and the Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

The City of Buckley has prepared a facility plan for upgrades to their wastewater treatment facility. When these upgrades have been completed another series of effluent characterizations for acute and chronic whole effluent toxicity will be required.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge does not contain chemicals of concern based on data collected during the current permit term. The discharge will be re-evaluated for impacts to human health at the next permit issuance.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

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The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. If the Department determines in the future that there is a potential for violation of the Sediment Quality Standards, an order will be issued to require the Permittee to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED JULY 28, 1994

Existing Limits	Proposed Limits
BOD ₅ 30 mg/L 111 lbs/day 45 mg/L 167 lbs/day	BOD ₅ 30 mg/L 134 lbs/day 45 mg/L 201 lbs/day
TSS 30 mg/L 95 lbs/day 45 mg/L 142 lbs/day	TSS 30 mg/L 114 lbs/day 45 mg/L 171 lbs/day
F. Coliform 200/100 mL - 400/100 mL	F. Coliform 100/100 mL - 200/100 mL
pH 6.0 - 8.5	pH 6.5 - 8.5
Ammonia-N 2.5 mg/L May-Oct 5.5 mg/L 62 lbs/day	Ammonia-N 2.6 mg/L May-Oct 7.4 mg/L 62 lbs/day
Ammonia-N 4.5 mg/L Nov-Apr 10.5 mg/L	Ammonia-N N/A Nov-Apr
Chlorine 9 µg/L 23 µg/L	Chlorine 9 µg/L 23 µg/L
Copper N/A 14 µg/L	Copper 11.13 µg/L 16.24 µg/L

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for Oxidation Ditch Activated Sludge Secondary Treatment with Chlorine Disinfection.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for BOD₅, COD, TSS, Ammonia-N, Dissolved Oxygen, Total Residual Chlorine, Fecal Coliform, and pH.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Pierce County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department has been delegated authority to administer the Pretreatment Program [i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)]. Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The

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requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing state waste discharge permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)] (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a state waste discharge permit 60 days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with state water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a state waste discharge permit application.

Requirements for Performing an Industrial User Survey

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of state waste discharge permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem. An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential

significant industrial users. A complete listing of methodologies is available in the Department of Ecology guidance document entitled "Conducting an Industrial User Survey."

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

RECEIVING WATER STUDY

Proposed permit condition S8 requires a receiving water study to gather information to determine if the effluent has a reasonable potential to cause a violation of the water quality standards.

Total and Dissolved Metals – The receiving water near the outfall will be sampled for both total and dissolved metals as well as hardness to determine if there is a potential to violate water quality standards for metals and to develop translator values for the total recoverable to dissolved fraction of metals.

Dissolved Oxygen - The receiving water near the outfall will be sampled for BOD₅, Total Kjeldahl Nitrogen (TKN), dissolved oxygen, and temperature to determine if there is the potential for a violation of dissolved oxygen standard.

Ammonia - The receiving water near the outfall shall also be sampled for total ammonia, pH and temperature to determine the potential for the effluent to cause a violation of the water quality standards for total ammonia.

pH - Alkalinity will be tested to determine whether the water quality or technology based standard for pH should apply to the discharge.

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the FWPCA and RCW 90.48.080.

OUTFALL EVALUATION

Proposed permit Condition S.11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations(<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 21, 2002, and July 28, 2002, in the *Tacoma News Tribune* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on February 26, 2003, in the *Courier Herald* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Carey Cholski
Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6275, or by writing to the address listed above.

This permit and fact sheet were written by Glenn Pieritz.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --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 (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- 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. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅ -- The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celcius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

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- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--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 operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Streeter-Phelps analysis of critical dissolved oxygen sag.

Based on Lotus File DOSAG2.WK1 Revised 19-Oct-93

Notes: Buckley WWTF

INPUT

1. EFFLUENT CHARACTERISTICS

Maximum Month Flow (MGD):	1
Discharge (cfs):	1.55
CBOD5 (mg/L):	51.50
NBOD (mg/L): 4.57*(Ammonia-N + Organic N)	17.73
Dissolved Oxygen (mg/L):	3.90
Temperature (deg C):	22.30

2. RECEIVING WATER CHARACTERISTICS

Upstream Discharge (cfs):	130.00
Upstream CBOD5 (mg/L):	0.90
Upstream NBOD (mg/L): 4.57*(Ammonia-N + Organic N)	0.21
Upstream Dissolved Oxygen (mg/L):	10.75
Upstream Temperature (deg C):	12.70
Elevation (ft NGVD):	720.00
Downstream Average Channel Slope (ft/ft):	0.0066
Downstream Average Channel Depth (ft):	1.19
Downstream Average Channel Velocity (fps):	3.15

3. REAERATION RATE (Base e) AT 20 deg C (day⁻¹):

Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	26.36
O'Connor and Dobbins	.1 - 1.5	2 - 50	17.72
Owens	.1 - 6	1 - 2	33.77
Tsivoglou-Wallace	.1 - 6	.1 - 2	86.15

4. BOD DECAY RATE (Base e) AT 20 deg C (day⁻¹):

Reference	Suggested Value
Wright and McDonnell, 1979	0.94

OUTPUT

1. INITIAL MIXED RIVER CONDITION	
CBOD5 (mg/L):	1.5
NBOD (mg/L):	0.4
Dissolved Oxygen (mg/L):	10.7
Temperature (deg C):	12.8
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day ⁻¹):	30.44
BOD Decay (day ⁻¹):	0.68
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	2.2
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	2.6
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	10.310
Initial Deficit (mg/L):	-0.36
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	0.19
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):	9.97
7. CRITICAL DO DEFICIT (mg/L):	0.05
8. CRITICAL DO CONCENTRATION (mg/L):	10.26

Simple Mixing Analysis for Temperature

Notes: Buckley WWTF

INPUT	Jan-Dec	May-Oct	Nov-Apr
1. Chronic Dilution Factor at Mixing Zone Boundary	11.35	26.11	10.11
2. Upstream Background Temperature	13.10	13.94	7.73
3. Effluent Temperature	20.30	20.30	13.90
OUTPUT			
1. Incremental Temperature Increase Limit = $28/(T+7)$:	1.39	1.34	1.90
2. Incremental Temperature Increase:	0.63	0.24	0.61
3. Temperature at Mixing Zone Boundary:	13.73	14.18	8.34

Calculation of pH of a mixture of two flows. Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

Notes: Buckley WWTF

INPUT	Oct-Sep	May-Oct	Nov-Apr
1. CHRONIC DILUTION FACTOR AT MIXING ZONE BOUNDARY	11.35	26.11	10.11
1. UPSTREAM/BACKGROUND CHARACTERISTICS			
Temperature (deg C):	13.10	13.94	7.73
pH:	7.60	7.57	7.60
Alkalinity (mg CaCO3/L):	26.00	26.00	26.00
2. EFFLUENT CHARACTERISTICS			
Temperature (deg C):	20.30	20.30	13.90
pH:	7.51	7.50	7.51
Alkalinity (mg CaCO3/L):	47.00	47.00	47.00
OUTPUT			
1. IONIZATION CONSTANTS			
Upstream/Background pKa:	6.44	6.43	6.49
Effluent pKa:	6.38	6.38	6.43
2. IONIZATION FRACTIONS			
Upstream/Background Ionization Fraction:	0.94	0.93	0.93
Effluent Ionization Fraction:	0.93	0.93	0.92
3. TOTAL INORGANIC CARBON			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	27.78	27.88	28.00
Effluent Total Inorganic Carbon (mg CaCO3/L):	50.48	50.56	50.90
4. CONDITIONS AT MIXING ZONE BOUNDARY			
Temperature (deg C):	13.73	14.18	8.34
Alkalinity (mg CaCO3/L):	27.85	26.80	28.08
Total Inorganic Carbon (mg CaCO3/L):	29.78	28.75	30.26
pKa:	6.43	6.43	6.48
pH at Mixing Zone Boundary:	7.59	7.57	7.59

Water Quality-Based Permit Limits for Acute and Chronic Criteria.
(based on EPA/505/2-90-001 Box 5-2).

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

Notes: Buckley WWTF Total Residual Chlorine

INPUT

1. Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	19.000
Chronic (n-day) Criteria:	11.000
2. Upstream Receiving Water Concentration	
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0.00
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0.00
3. Dilution Factors (1/{Effluent Volume Fraction}) or Plumes Model	
Acute Receiving Water Dilution Factor:	2.62
Chronic Receiving Water Dilution Factor:	11.35
4. Coefficient of Variation for Effluent Concentration (0.6 or a calculated CV if there are more than 10 data points):	0.60
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4
6. Number of samples (n2) required per month for monitoring:	1

OUTPUT

1. Z Statistics	
LTA Derivation (99%tile):	2.326
Daily Maximum Permit Limit (99%tile):	2.326
Monthly Average Permit Limit (95%tile):	1.645
2. Calculated Waste Load Allocations (WLA's)	
Acute (one-hour) WLA:	49.780
Chronic (n1-day) WLA:	124.850
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)	
Sigma^2:	0.3075
Sigma^2-n1:	0.0862
LTA for Acute (1-hour) WLA:	15.980
LTA for Chronic (n1-day) WLA:	65.843
Most Limiting LTA (minimum of acute and chronic):	15.980
4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)	
Sigma^2-n2:	0.3075
Daily Maximum Permit Limit:	49.78
Monthly Average Permit Limit:	34.11

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Effluent Concentration COV = 0.6
n, number of samples per month = 8
normal distribution

Ammonia-N mgN/L	Daily Max	Monthly Avg
October to September =	18.45	8.18
May to October =	22.73	10.08
November to April =	17.27	7.66

log-normal distribution

Ammonia-N mgN/L	Daily Max	Monthly Avg
October to September =	18.23	8.08
May to October =	22.75	10.09
November to April =	17.13	7.60

log-pearson type III distribution

Ammonia-N mgN/L	Daily Max	Monthly Avg
October to September =	19.14	8.49
May to October =	22.71	10.07
November to April =	17.05	7.56

Water Year October to September Annual Dilution Factor

	18.45	17.90			18.23	17.52
Water Year	Min Acute	Min Chronic		Date	Min Acute	Min Chronic
1994	15.3093	16.3140		>9/30/1994	1.1850	1.2126
				Date		
1995	18.9100	26.0862		>9/30/1995	1.2767	1.4164
				Date		
1996	15.5642	12.8404		>9/30/1996	1.1921	1.1086
				Date		
1997	20.0824	18.2585		>9/30/1997	1.3028	1.2615
				Date		
1998	23.5149	17.9112		>9/30/1998	1.3713	1.2531
				Date		
1999	23.2597	22.8729		>9/30/1999	1.3666	1.3593
				Date		
2000	22.7956	21.8556		>9/30/2000	1.3579	1.3396
				Date		
2001	19.3837	21.4698		>9/30/2001	1.2874	1.3318

May to October Dry Weather Dilution Factor

	22.73	30.74			22.75	30.84
Water Year	Min Acute	Min Chronic		Date	Min Acute	Min Chronic
1995	18.9100	31.3466		>4/30/1995	1.2767	1.4962

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			Date	Date		
1996	22.8154	30.1597	>4/30/1996	<11/1/1996	1.3582	1.4794
			Date	Date		
1997	22.8293	30.4091	>4/30/1997	<11/1/1997	1.3585	1.4830
			Date	Date		
1998	52.1295	43.3357	>4/30/1998	<11/1/1998	1.7171	1.6368
			Date	Date		
1999	46.8435	40.3386	>4/30/1999	<11/1/1999	1.6706	1.6057
			Date	Date		
2000	33.2186	35.8857	>4/30/2000	<11/1/2000	1.5214	1.5549
			Date	Date		
2001	30.4222	32.3405	>4/30/2001	<11/1/2001	1.4832	1.5097
			Date	Date		
2002	43.3276	37.3175	>4/30/2002	<11/1/2002	1.6368	1.5719

November to April Wet Weather Dilution Factor

	17.27	15.95			17.13	15.79
Water Year	Min Acute	Min Chronic	Date	Date	Min Acute	Min Chronic
1994	15.3093	16.3140	>10/31/1994	<5/1/1995	1.1850	1.2126
			Date	Date		
1995	26.0585	26.0862	>10/31/1995	<5/1/1996	1.4159	1.4164
			Date	Date		
1996	15.5642	12.8404	>10/31/1996	<5/1/1997	1.1921	1.1086
			Date	Date		
1997	20.0824	18.2585	>10/31/1997	<5/1/1998	1.3028	1.2615
			Date	Date		
1998	23.5149	17.9112	>10/31/1998	<5/1/1999	1.3713	1.2531
			Date	Date		
1999	23.2597	22.8729	>10/31/1999	<5/1/2000	1.3666	1.3593
			Date	Date		
2000	22.7956	21.8556	>10/31/2000	<5/1/2001	1.3579	1.3396
			Date	Date		
2001	19.3837	21.4698	>10/31/2001	<5/1/2002	1.2874	1.3318

Log-Pearson type III frequency factor method

Estimated
Using Excel's
Statistical Functions
climatic year

Number of data points	8
Mean of log10 transformed values	1.2925
Standard deviation of log10 transformed values	0.0737

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Skew of log10 transformed values	-0.5140
Recurrence Interval, years	3
Estimated K for Log Pearson type III method, 3-yr recurrence	0.143
Acute Annual Dilution Factor	19.14

	Estimated Using Excel's Statistical Functions climatic year
<u>Log-Pearson type III frequency factor method</u>	
Number of data points	8
Mean of log10 transformed values	1.5028
Standard deviation of log10 transformed values	0.1628
Skew of log10 transformed values	-0.0274
Recurrence Interval, years	5.4
Estimated K for Log Pearson type III method, 5.4-yr recurrence	0.900
Acute May - Oct Dilution Factor	22.71

	Estimated Using Excel's Statistical Functions climatic year
<u>Log-Pearson type III frequency factor method</u>	
Number of data points	8
Mean of log10 transformed values	1.3099
Standard deviation of log10 transformed values	0.0850
Skew of log10 transformed values	-0.5820
Recurrence Interval, years	5.4
Estimated K for Log Pearson type III method, 5.4-yr recurrence	0.920
Acute Nov - Apr Dilution Factor	17.05

	Estimated Using Excel's Statistical Functions climatic year
<u>Log-Pearson type III frequency factor method</u>	
Number of data points	8
Mean of log10 transformed values	1.2854
Standard deviation of log10 transformed values	0.0970
Skew of log10 transformed values	-0.6343

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Recurrence Interval, years

3

Estimated K for Log Pearson type III method, 3-yr recurrence

0.204

Chronic Annual Dilution Factor

18.43

Log-Pearson type III frequency factor method

Estimated
Using Excel's
Statistical Functions
climatic year

Number of data points

8

Mean of log10 transformed values

1.5422

Standard deviation of log10 transformed values

0.0593

Skew of log10 transformed values

0.4962

Recurrence Interval, years

5.4

Estimated K for Log Pearson type III method, 5.4-yr recurrence

0.876

Chronic May - Oct Dilution Factor

30.92

Log-Pearson type III frequency factor method

Estimated
Using Excel's
Statistical Functions
climatic year

Number of data points

8

Mean of log10 transformed values

1.2854

Standard deviation of log10 transformed values

0.0970

Skew of log10 transformed values

-0.6343

Recurrence Interval, years

5.4

Estimated K for Log Pearson type III method, 5.4-yr recurrence

0.918

Chronic Nov - Apr Dilution Factor

15.71

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Hardness =		Acute Hardness		Chronic Hardness	
		32.78	26.03		
		Surface Water Criteria, mg/L			
#	Parameter	Dissolved Criteria		Total Recoverable Criteria	
		Acute	Chronic	Acute	Chronic
1	Arsenic	360	190	360	190
2	Cadmium	1.104166734	0.380509838	1.114569317	0.394181125
3	Chromium (Hex)	15	10	15.27494908	10.3950104
4	Chromium (Tri)	220.1070492	59.10942287	696.5412949	68.73188706
5	Copper	5.949133449	3.593367354	6.197014009	3.743090994
6	Iron	---	---	---	---
7	Lead	18.81959926	0.566037542	19.73681517	0.573412672
8	Manganese	---	---	---	---
9	Mercury	2.1	---	2.470588235	0.012
10	Nickel	550.8976549	50.33520701	552.0016582	50.48666701
11	Selenium	---	---	20	5
12	Silver	0.506564772	---	0.595958555	---
13	Zinc	44.48011125	33.40639016	45.48068635	33.88072024

Simple Mixing Analysis		
Effluent Hardness =		47
Acute Dilution Factor =		2.62
Ambient Hardness =		24
Acute Hardness =		32.78
Effluent Hardness =		47
Chronic Dilution Factor =		11.35
Ambient Hardness =		24
Chronic Hardness =		26.03

Simple Mixing Analysis

Effluent Hardness =	47
Acute Dilution Factor =	2.62
Ambient Hardness =	24
Acute Hardness =	32.78
Effluent Hardness =	47
Chronic Dilution Factor =	11.35
Ambient Hardness =	24
Chronic Hardness =	26.03

Determining the Requirement for Permit Limits Through a Reasonable Potential Determination to Violate Standards at the Edge of the Mixing Zone.

Based on EPA/505/2-90-001

Notes: Buckley WWTF Copper

INPUT

Confidence Level and Probability Basis:	0.95
Coefficient of Variation for the Effluent Concentration (CV) (0.6 or a calculated CV if there are more than 10 data points):	0.6
Number of Effluent Samples or Data Points (ND):	47
Highest Effluent Concentration or Value (HV):	20.8
Dilution Factors ($1/\{\text{Effluent Volume Fraction}\}$) or plumes model	
Acute Receiving Water Dilution Factor:	2.62
Chronic Receiving Water Dilution Factor:	11.35
Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	6.19701401
Chronic (n-day) Criteria:	3.74309099
Upstream Receiving Water Concentration:	
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0
MECB: 1-9 data points, highest value by 2; 10-50 the highest value; >50 calculate 90th %-tile	

OUTPUT

Percentile Represented by the Highest Concentration in Data Set $(p_n) = (1 - \text{confidence level})^{1/ND}$	0.938249865
Normal Distribution Value for 95th Percentile	1.644853476
Normal Distribution Value for 94th Percentile	1.54024667
$^2 = \ln(CV^2 + 1)$	0.3074847
$C95 = \exp(1.645\text{Sigma} - 0.5\text{Sigma}^2)$	2.134751686
$C94 = \exp(1.54\text{Sigma} - 0.5\text{Sigma}^2)$	2.014446559
Reasonable Potential Multiplier = $C95/C94$	1.06
Maximum Expected Concentration of Pollutant in Effluent (MEC):	22.04220057
Acute - Concentration of Pollutant at the Edge of the Mixing Zone (CP):	8.413053651

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Chronic - Concentration of Pollutant at the Edge of the Mixing Zone (CP): 1.942044103

Reasonable Potential to Violate Acute Criteria at the Edge of the Mixing Zone (RP): **YES**

Reasonable Potential to Violate Chronic Criteria at the Edge of the Mixing Zone (RP): **NO**

Water Quality-Based Permit Limits for Acute and Chronic Criteria.
(based on EPA/505/2-90-001 Box 5-2).

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

Notes: Buckley WWTF Copper

INPUT

1. Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	6.197
Chronic (n-day) Criteria:	3.743
2. Upstream Receiving Water Concentration	
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0
3. Dilution Factors ($1/\{\text{Effluent Volume Fraction}\}$) or Plumes Model	
Acute Receiving Water Dilution Factor:	2.62
Chronic Receiving Water Dilution Factor:	11.35
4. Coefficient of Variation for Effluent Concentration (0.6 or a calculated CV if there are more than 10 data points):	0.60
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4
6. Number of samples (n2) required per month for monitoring:	1

OUTPUT

1. Z Statistics	
LTA Derivation (99%tile):	2.326
Daily Maximum Permit Limit (99%tile):	2.326
Monthly Average Permit Limit (95%tile):	1.645
2. Calculated Waste Load Allocations (WLA's)	
Acute (one-hour) WLA:	16.236
Chronic (n1-day) WLA:	42.484
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)	
Sigma ² :	0.3075
Sigma ² -n1:	0.0862
LTA for Acute (1-hour) WLA:	5.212
LTA for Chronic (n1-day) WLA:	22.405
Most Limiting LTA (minimum of acute and chronic):	5.212
4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)	
Sigma ² -n2:	0.3075

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Daily Maximum Permit Limit:	16.24
Monthly Average Permit Limit:	11.13

Fact Sheet for NPDES Permit No. WA0023361
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Buckley WWTF Copper Performed Based Limits

NUMBER OF SAMPLES/MONTH FOR COMPLIANCE MONITORING =	1
AUTOCORRELATION FACTOR (nc) (USE 0 IF UNKNOWN) =	0
LOGNORMAL TRANSFORMED MEAN =	2.46
LOGNORMAL TRANSFORMED VARIANCE =	0.262
E(X) =	13.3395
V(X) =	53.403
VARn =	0.2625
MEANn =	2.4595
VAR(Xn) =	53.403
MAXIMUM DAILY EFFLUENT LIMIT =	38.52
AVERAGE MONTHLY EFFLUENT LIMIT =	27.17

Total Copper Monthly Average		
Date	ug/L	ln(x)
1-Jul-96	10	2.303
1-Sep-96	10	2.303
1-Nov-96	41	3.714
1-Dec-96	10	2.303
1-Jan-97	14	2.639
1-Mar-97	12	2.485
1-May-97	10	2.303
1-Jul-97	10	2.303
1-Sep-97	10	2.303
1-Nov-97	34	3.526
1-Dec-97	10	2.303
1-Jan-98	10	2.303
1-Mar-98	23	3.135
1-Apr-98	10	2.303
1-Jun-98	22	3.091
1-Jul-98	10	2.303
1-Aug-98	10	2.303
1-Oct-98	70	4.248
1-Nov-98	15	2.708
1-Jan-99	10	2.303
1-Mar-99	11	2.398
1-May-99	9	2.197
1-Jul-99	16	2.773
1-Aug-99	12	2.485
1-Sep-99	8	2.079
1-Nov-99	5	1.609
1-Jan-00	6	1.792
1-Mar-00	6.5	1.872
1-May-00	15	2.708
1-Jul-00	18	2.890
1-Sep-00	7.8	2.054

Fact Sheet for NPDES Permit No. WA0023361
City of Buckley Wastewater Treatment Plant

1-Nov-00	20	2.996
1-Jan-01	11	2.398
1-Mar-01	7.2	1.974
1-May-01	8	2.079
1-Jul-01	14	2.639
1-Sep-01	12	2.485
1-Nov-01	13	2.565
1-Jan-02	6.8	1.917
1-Mar-02	5.7	1.740
1-May-02	8.77	2.171
1-Jul-02	10.5	2.351
1-Sep-02	11.1	2.407

APPENDIX D--RESPONSE TO COMMENTS

This response to comments (RTC) is an appendix to the fact sheet for the above referenced NPDES permit. The RTC summarizes comments received during the 30-day public notice and comment period on the draft permit, and provides the Department's response. All changes to the draft permit are noted below. The Department has determined to issue this permit as revised.

Comments were received from Citizens for a Healthy Bay.

Citizens for a Healthy Bay Comments:

1. Comment:

Mixing zone: A mixing zone, which allows discharge of pollutants that exceed the state water quality standards into Commencement Bay, is not in the spirit of the Clean Water Act. The objective of this act is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The routine authorization of mixing zones is counterproductive to meeting this objective. It is clearly stated in section 1251 of the CWA that, "it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited," and that "it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985." The Department's failure to phase out these mixing zones or even to include sunset language, which will encourage movement towards the elimination of these zones does nothing to achieve the goals of the CWA and is in direct violation of the spirit of the act. This wholesale authorization of mixing zones violates water quality standards determined and implemented by the state of Washington. The City of Buckley should be required to meet water quality standards at the end of the pipe.

Response:

The mixing zone for the City of Buckley's wastewater treatment facility discharge was established in accordance with, and authorized under, WAC 173-201A-100. The permit process is not the forum to address your concerns which would be better served during the update to WAC 173-201A which is currently underway. No change to permit.

2. Comment:

Anti-degradation: The White River is a class "A" water body. The anti-degradation policy in the state of Washington's Pollution Control Act WAC 173-201A-070 clearly states, "Existing beneficial uses shall be maintained and protected and no further degradation which would interfere with or become injurious to existing beneficial uses shall be allowed." Discharging pollutants known to be injurious to fish populations in amounts that exceed state water quality standards in an area which characterizes fish migration, rearing, and spawning habitat among the "beneficial uses" is in violation of this act and should not be allowed.

Response:

The permit limits derived for the discharge from the City of Buckley's wastewater treatment facility are in compliance with the state of Washington water quality standards established in

Fact Sheet for NPDES Permit No. WA0023361
City of Buckley Wastewater Treatment Plant

WAC 173-201A. As stated in the previous comment, the proper forum to address your concerns is the update to WAC 173-201A, which is currently underway. No change to permit.

3. **Comment:**

Infiltration The City of Buckley's plant was constructed in 1952 and later upgraded to achieve secondary treatment in 1980. Infiltration studies completed in 1973, 1975, and again in 1994 determined that infiltration and inflow of stormwater need to be reduced by at least 45 percent. As of late 2001, there was no clear indication that infiltration and inflow had been reduced. It is vital that this facility be upgraded and that the 2/3 of the system that is still constructed of clay pipes with mortared joints be replaced.

Response:

The City of Buckley has submitted a Comprehensive General Sewer/Facility Plan for upgrades to their wastewater treatment facilities. Buckley also completed an intensive program that replaced over 1/3 of their collection system. Infiltration and inflow work on the Buckley wastewater collection system will continue although at a much slower rate as funds allow. Should sanitary sewer overflows begin occurring, the City would be required to implement a sanitary sewer bypass elimination program. No change to permit required.

STATEMENT OF BASIS
CITY OF BUCKLEY
NPDES PERMIT NO. WA0023361

The purpose of this Statement of Basis is to explain the need to modify the Permit to remove the requirement to submit monthly summary report Form EPA No. 3320-1 to the Department of Ecology.

I. GENERAL INFORMATION

- A. Permittee: City of Buckley
P.O. Box 1960
Buckley, WA 98321
- B. Discharge Locations: White River at Buckley
Latitude: 47° 10' 19" N
Longitude: 122° 02' 08" W

II. REQUEST FOR MODIFICATION:

Modification made to the permit include removing the requirement to submit a monthly summary report form EPA No. 3320-1 to the Department of Ecology found in S3.A of the permit. Section S3.A will be modified from:

In addition to the monthly report, a monthly summary report form (EPA No. 3320-1) shall be received no later than the 15th day of the following month. This report is limited to the parameters specified in special condition S1.

To being deleted from that section of the permit.

This Statement of Basis will serve as an amendment to the Fact Sheet and Permit.

APPENDIX B

INFILTRATION/INFLOW REPORTS, SUMMARY OF DAILY MONITORING REPORTS, MAY 2009 THROUGH APRIL 2019

Permit No. WA0023361

Reporting Year: From: 11/01/14 To: October 31 2015

Design Population Equivalent: 10,500

Peak daily design flow:	4 MGD
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Additional Sewer Lines Added (feet)		
Year		
2012/13	2013/14	2014/15
		4750
0	0	4750
0.00	0.00	0.90

0.58 MGD

Year	I/I, mgd	% increase from base I/I	% of avg. design flow
2012/13	0.424	-26.897	19.813
2013/14	0.908	56.552	42.430
2014/15	0.617	6.379	28.832

James R. Doty Plant Supervisor
Signature and Title

City of Buckley Wastewater Treatment PlantPermit No. **WA0023361****Infiltration/Inflow (I/I) Report**Reporting Year: From: **11/01/17** To: **October 31 2018**Max month design flow: **2.14** MGDDesign Population Equivalent: **10,500**Peak daily design flow: **4** MGD

	Average Monthly Flow (MGD)			Total Monthly Rainfall (inches)			Population Served			Additional Sewer Lines Added (feet)		
	Year			Year			Year			Year		
Month	2015/16	2016/2017	2017/18	2015/16	2016/2017	2017/18	2015/16	2016/2017	2017/18	2015/16	2016/2017	2017/18
January	1.010	0.641	1.164	8.1	2.6	6.7						
February	1.025	1.182	0.949	6.4	7.8	4.2						
March	0.931	1.267	0.610	5.3	8.8	2.4						
April	0.401	0.826	0.916	1.7	4.8	5.8						
May	0.323	0.737	0.410	4.5	6.3	1.7						
June	0.389	0.439	0.334	3.2	2.5	1.1						
July	0.336	0.297	0.298	1.7	0.0	0.3						
August	0.296	0.306	0.306	0.6	0.2	0.5						
September	0.326	0.318	0.353	2.1	1.5	1.8						
October	0.738	0.688	0.427	9.2	8.1	4.3						
November	1.251	0.880	1.114	8.0	5.1	7.8						
December	1.399	0.815	0.994	11.3	3.8	5.8	4600	4670	4765	0	6500	3725
TOTAL	8.425	8.395	7.875	62.0	51.6	42.5	Total (feet)			0	6500	3725
High	1.399	1.267	1.164				Total (miles)			0.00	1.23	0.71
Low	0.296	0.297	0.298									
Average	0.702	0.700	0.656									
I/I, MGD	1.103	0.970	0.866									

Base Year: **1982**Base Year I/I: **0.58 MGD****Infiltration/Inflow Summary**

Year	I/I, mgd	% increase from base I/I	% of avg. design flow
2015/16	1.103	90.172	51.542
2016/2017	0.970	67.276	45.336
2017/18	0.866	49.362	40.481

Comments: Glacier Meadows Development-3,725' Mainline Sewer Added.

Signature and Title

Month	Average Monthly Inflow (MGD)	Average Effluent Ammonia Conc. (mg/L)	Influent BOD Conc. (mg/L)	Influent BOD Loading (lb/day)	Influent TSS Conc. (mg/L)	Influent TSS Loading (lb/day)	Effluent BOD Conc. (mg/L)	Effluent BOD Loading (lb/day)	Effluent TSS Conc. (mg/L)	Effluent TSS Loading (lb/day)	BOD Removal (%)	TSS Removal (%)
May-09	0.511	0.13	216	808	210	793	1.1	4.4	1.3	5.8	99.5	99.4
June-09	0.310	0.25	267	718	233	643	1.6	5.8	1.6	5.5	99.4	99.3
Jul-09	0.269	0.26	341	702	303	614	1.8	4.6	2.1	5.3	99.5	99.3
Aug-09	0.282	0.26	304	686	259	591	1.5	4.0	1.7	5.2	99.5	99.3
Sep-09	0.307	0.18	260	653	277	702	1.3	3.9	1.5	5.3	99.5	99.4
Oct-09	0.458	0.20	279	836	239	751	1.3	5.0	2.6	9.7	99.5	98.9
Nov-09	0.891	0.20	167	1148	162	1123	1.4	11.2	2.1	17.3	99.2	98.7
Dec-09	0.586	3.12	201	882	175	768	1.4	7.5	2.3	12.3	99.3	98.7
Jan-10	0.813	0.11	135	793	156	952	1.5	9.3	3.0	19.1	98.9	98.1
Feb-10	0.617	0.14	157	791	126	641	1.0	5.7	2.1	11.6	99.4	98.3
Mar-10	0.581	0.15	183	832	142	652	0.8	4.1	1.7	8.5	99.6	98.8
Apr-10	0.663	0.16	167	822	140	718	2.3	18.9	3.0	27.4	98.6	97.8
May-10	0.684	0.18	171	757	118	528	1.3	7.2	1.0	5.7	99.2	99.1
Jun-10	0.892	0.13	166	919	144	792	1.1	8.3	1.2	9.4	99.3	99.2
Jul-10	0.346	4.21	297	731	216	543	4.8	12.8	3.4	9.2	98.4	98.4
Aug-10	0.291	0.93	299	668	243	539	3.2	7.8	4.6	11.1	98.9	98.1
Sep-10	0.504	0.33	215	843	156	628	3.2	15.2	5.6	28.2	98.5	96.4
Oct-10	0.529	0.21	202	800	164	654	1.9	8.9	2.1	9.4	99.1	98.7
Nov-10	0.913	0.13	115	902	86	678	1.5	11.8	1.4	11.6	98.7	98.3
Dec-10	0.895	0.09	120	816	90	630	2.0	16.9	2.5	20.3	98.3	97.2
Jan-11	1.032	0.18	119	842	85	616	2.2	17.0	2.5	18.8	98.2	97.1
Feb-11	0.716	0.54	162	949	110	635	2.7	16.5	2.4	14.5	98.3	97.9
Mar-11	1.018	0.44	125	1036	122	1030	2.4	19.6	3.0	26.3	98.1	97.5
Apr-11	1.096	0.21	145	1135	144	1107	2.4	20.8	3.0	28.1	98.3	97.9
May-11	0.836	0.15	169	1251	140	1082	2.7	25.5	3.2	29.7	98.4	97.7
Jun-11	0.641	0.50	187	906	148	718	4.6	24.2	4.7	25.4	97.6	96.8
Jul-11	0.430	0.79	281	875	283	883	7.2	26.2	10.1	36.5	97.4	96.4
Aug-11	0.437	0.30	400	1206	295	894	4.4	16.0	6.2	22.3	98.9	97.9
Sep-11	0.443	0.10	337	1071	322	1067	4.0	14.8	4.9	18.3	98.8	98.5

Month	Average Monthly Inflow (MGD)	Average Effluent Ammonia Conc. (mg/L)	Influent BOD Conc. (mg/L)	Influent BOD Loading (lb/day)	Influent TSS Conc. (mg/L)	Influent TSS Loading (lb/day)	Effluent BOD Conc. (mg/L)	Effluent BOD Loading (lb/day)	Effluent TSS Conc. (mg/L)	Effluent TSS Loading (lb/day)	BOD Removal (%)	TSS Removal (%)
Oct-11	0.521	0.09	259	1055	297	1262	3.0	13.5	4.9	22.4	98.8	98.3
Nov-11	0.733	0.13	213	1464	28	1518	2.5	14.9	3.6	22.7	98.8	98.3
Dec-11	0.618	0.21	302	1576	417	2483	3.7	18.7	3.1	16.5	98.8	99.3
Jan-12	1.002	0.08	141	1124	184	1434	4.0	32.6	6.0	49.7	97.2	96.7
Feb-12	0.831	0.05	156	1088	225	1680	3.9	27.2	4.5	33.6	97.5	98.0
Mar-12	0.902	0.02	144	1023	157	1155	2.8	20.0	3.0	22.1	98.1	98.1
Apr-12	0.813	0.03	141	742	149	782	2.1	12.1	1.9	11.4	98.5	98.7
May-12	0.700	0.04	208	980	178	854	1.8	10.1	1.9	11.0	99.1	99.0
Jun-12	0.661	0.90	239	1240	272	1356	3.2	16.0	3.6	18.1	98.7	98.7
Jul-12	0.462	3.30	302	980	339	1097	4.3	15.4	5.7	20.5	98.6	98.3
Aug-12	0.410	8.51	394	1070	386	1051	6.8	23.1	6.4	21.6	98.3	98.3
Sep-12	0.364	0.12	179	1136	186	1195	3.3	9.6	4.7	13.9	98.2	97.5
Oct-12	0.541	0.11	261	989	223	874	3.0	12.7	3.5	15.8	98.8	98.4
Nov-12	0.906	0.05	112	772	104	718	2.1	15.3	3.2	23.6	98.0	97.0
Dec-12	0.994	0.06	107	880	121	969	2.5	20.1	1.0	32.4	97.7	96.7
Jan-13	0.704	0.14	122	621	113	593	2.8	17.9	4.1	28.6	97.7	96.3
Feb-13	0.603	0.08	138	639	124	580	3.5	17.4	4.8	25.5	97.4	96.1
Mar-13	0.782	0.07	118	702	128	788	2.9	18.6	3.2	21.3	97.6	97.5
Apr-13	0.905	0.17	166	1133	128	917	3.5	28.3	4.4	36.6	97.9	96.5
May-13	0.608	0.11	137	864	130	828	3.6	17.9	3.5	19.4	97.4	97.3
Jun-13	0.450	0.14	176	1039	158	939	3.2	11.4	2.9	10.5	98.2	98.1
Jul-13	0.348	0.13	148	986	144	984	2.9	8.2	3.3	9.3	98.0	97.7
Aug-13	0.339	0.12	175	1025	189	1083	3.2	8.4	2.0	5.2	98.2	98.9
Sep-13	0.535	0.13	145	1005	230	1610	3.2	14.9	3.8	22.8	97.8	98.3
Oct-13	0.601	0.24	182	742	217	880	3.8	16.5	4.6	22.7	97.9	97.9
Nov-13	0.729	0.22	127	675	216	1199	4.0	22.8	4.2	24.6	96.8	98.1
Dec-13	0.693	0.20	134	750	163	885	3.1	20.0	3.6	23.4	97.7	97.8
Jan-14	0.827	0.11	145	873	171	1239	3.7	27.5	3.5	28.9	97.4	97.9
Feb-14	1.003	0.05	104	924	112	956	3.0	34.4	3.3	41.2	97.1	97.1

Month	Average Monthly Influent Flow (MGD)	Average Effluent Ammonia Conc. (mg/L)	Influent BOD Conc. (mg/L)	Influent BOD Loading (lb/day)	Influent TSS Conc. (mg/L)	Influent TSS Loading (lb/day)	Effluent BOD Conc. (mg/L)	Effluent BOD Loading (lb/day)	Effluent TSS Conc. (mg/L)	Effluent TSS Loading (lb/day)	BOD Removal (%)	TSS Removal (%)
Mar-14	1.225	0.03	96	874	152	1263	2.5	29.7	3.0	38.4	97.4	98.0
Apr-14	0.896	0.36	128	870	117	815	2.5	17.7	4.8	20.6	98.1	95.9
May-14	0.594	0.10	190	878	203	957	2.9	14.9	2.5	13.6	98.5	98.8
Jun-14	0.510	0.15	230	861	242	908	3.1	10.6	3.2	10.9	98.7	98.7
Jul-14	0.484	0.30	221	948	254	1097	6.1	22.5	7.9	27.2	97.3	96.9
Aug-14	0.358	0.12	238	742	305	929	3.8	14.1	3.6	13.3	98.4	98.8
Sep-14	0.342	0.12	298	816	350	969	3.1	10.0	3.3	10.6	98.9	99.1
Oct-14	0.589	0.12	223	844	246	902	2.7	13.3	3.4	19.1	98.8	98.6
Nov-14	0.937	0.13	127	835	144	1123	3.5	24.9	5.5	56.1	97.2	96.2
Dec-14	0.892	0.13	140	1031	190	1435	3.3	25.2	4.8	38.5	97.6	97.5
Jan-15	0.900	0.10	171	1122	201	1317	3.6	23.6	6.3	41.8	97.9	96.9
Feb-15	0.834	0.12	135	748	146	835	3.5	24.5	4.7	36.5	97.4	96.8
Mar-15	0.803	0.12	123	714	120	765	5.9	50.8	11.1	106.9	95.1	90.8
Apr-15	0.549	0.16	179	744	226	739	4.9	21.2	8.3	35.5	97.3	96.4
May-15	0.370	0.11	237	693	225	663	5.4	17.8	7.7	26.0	97.7	96.6
Jun-15	0.357	0.14	243	683	256	717	4.5	14.5	6.3	20.5	98.2	97.5
Jul-15	0.338	0.14	265	719	291	785	4.0	10.8	3.7	11.4	98.5	98.7
Aug-15	0.320	0.08	314	870	343	959	3.0	8.9	2.9	9.4	99.0	99.2
Sep-15	0.346	0.14	248	717	239	705	2.9	8.5	3.9	12.9	98.8	98.4
Oct-15	0.509	0.08	215	705	228	742	2.5	8.8	3.2	11.6	98.8	98.6
Nov-15	1.251	0.06	109	978	115	999	3.7	46.4	6.3	85.7	96.7	94.6
Dec-15	1.399	0.04	105	1013	117	1504	3.1	36.6	5.1	64.0	97.0	95.6
Jan-16	1.010	0.07	146	1043	139	1039	2.7	22.3	3.8	33.4	98.2	97.2
Feb-16	1.025	0.06	128	986	121	995	2.9	23.8	5.0	41.4	97.7	95.9
Mar-16	0.931	0.23	124	900	136	984	3.0	23.4	4.7	37.7	97.6	96.5
Apr-16	0.401	0.12	203	669	199	643	2.1	7.7	2.7	9.7	99.0	98.7
May-16	0.323	0.14	276	756	249	683	2.6	7.8	3.1	9.2	99.0	96.8
Jun-16	0.389	0.11	252	759	231	696	1.6	5.1	2.1	6.7	99.4	99.1
Jul-16	0.336	0.17	286	774	372	1006	2.9	8.4	2.4	6.7	99.0	99.4

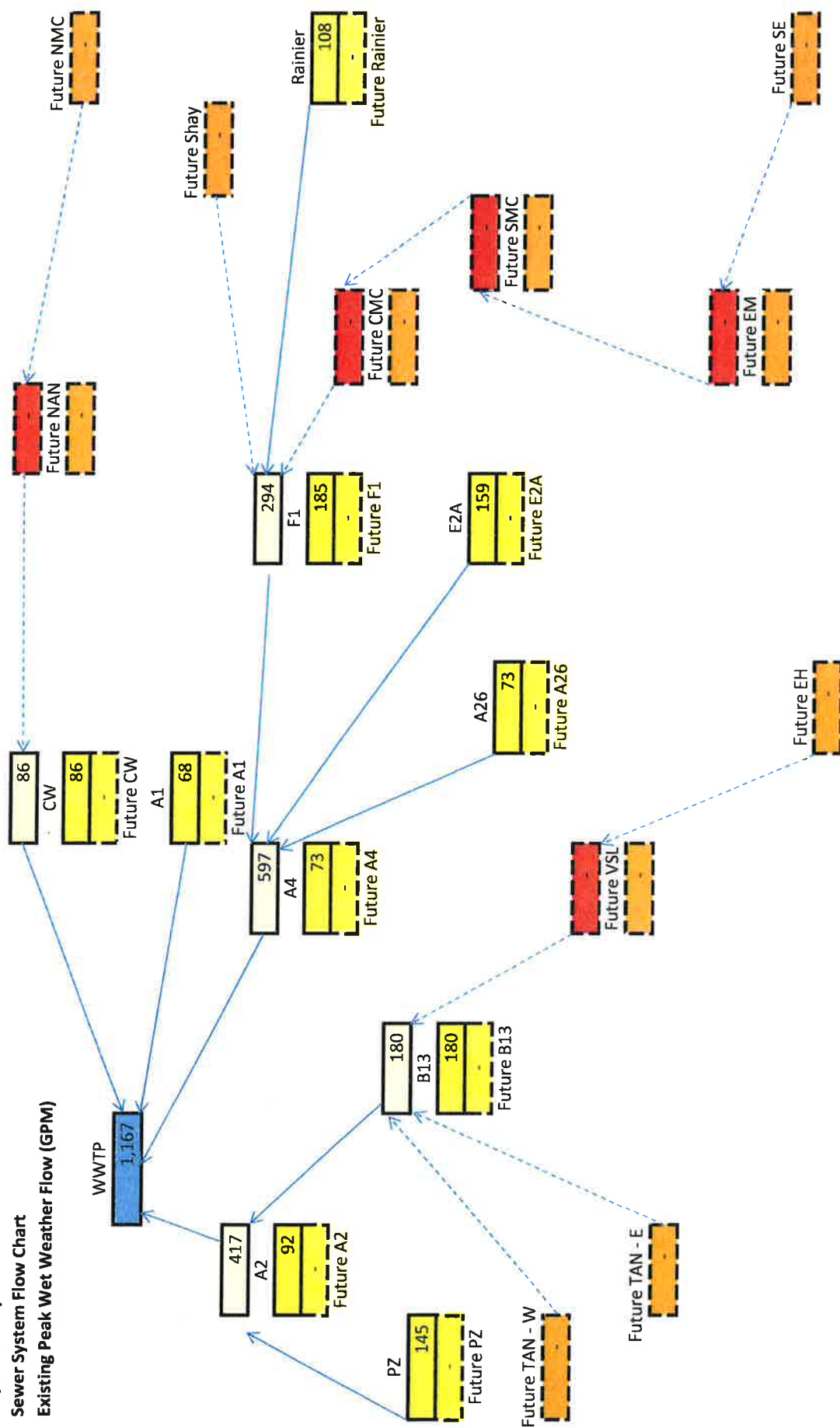
Month	Average Monthly Influent Flow (MGD)	Average Effluent Ammonia Conc. (mg/L)	Influent BOD Conc. (mg/L)	Influent BOD Loading (lb/day)	Influent TSS Conc. (mg/L)	Influent TSS Loading (lb/day)	Effluent BOD Conc. (mg/L)	Effluent BOD Loading (lb/day)	Effluent TSS Conc. (mg/L)	Effluent TSS Loading (lb/day)	BOD Removal (%)	TSS Removal (%)
Aug-16	0.296	0.47	308	766	475	1170	5.0	13.6	3.4	9.7	98.4	99.3
Sep-16	0.326	0.12	297	797	377	1014	4.3	11.8	3.5	9.9	98.6	99.1
Oct-16	0.738	0.21	186	854	256	1185	2.9	16.5	2.7	14.9	98.4	98.9
Nov-16	0.880	0.03	109	762	90	634	1.9	14.0	1.4	11.5	98.3	98.5
Dec-16	0.815	0.04	115	778	120	858	3.4	25.5	1.5	11.8	96.7	98.7
Jan-17	0.648	0.09	155	793	189	998	3.0	19.1	2.2	18.1	97.8	98.5
Feb-17	1.185	0.22	105	820	144	1202	2.7	25.1	4.5	43.3	97.0	96.2
Mar-17												
Apr-17	0.825	0.07	146	968	166	1118	2.2	14.5	2.4	15.9	98.5	98.4
May-17	0.782	0.08	173	841	194	969	2.1	11.6	2.1	11.8	97.8	98.9
Jun-17	0.503	0.20	261	857	213	691	2.6	9.5	1.8	6.7	99.0	99.1
Jul-17	0.352	0.16	319	775	292	709	3.5	9.8	3.0	8.4	98.8	98.9
Aug-17	0.355	0.19	405	1016	419	1050	2.8	7.9	2.9	8.3	99.3	99.3
Sep-17	0.345	0.24	331	879	354	951	2.6	7.5	2.1	6.2	99.1	99.4
Oct-17	0.699	0.53	208	732	237	1430	1.3	8.1	4.4	60.7	99.1	97.4
Nov-17	1.088	1.79	152	1066	176	1351	2.2	18.3	2.2	19.8	98.2	98.4
Dec-17	1.009	2.40	167	1036	240	1823	2.9	20.2	2.6	20.7	98.1	98.9
Jan-18	1.106	0.10	118	920	136	1078	2.1	16.2	3.5	28.2	98.1	97.2
Feb-18	0.956	0.11	119	842	129	936	1.9	15.0	3.5	29.4	98.2	97.0
Mar-18	0.650	0.20	159	769	179	874	1.5	7.9	2.5	13.1	99.0	98.5
Apr-18	0.909	0.27	158	954	178	1112	1.7	12.7	1.7	14.3	98.7	98.8
May-18	0.468	0.10	308	960	324	1019	2.2	8.2	2.2	8.1	99.1	99.3
Jun-18	0.392	0.11	423	1161	456	1252	2.5	7.4	2.0	5.8	99.4	99.5
Jul-18	0.392	0.23	402	973	450	1085	3.3	10.1	2.3	6.7	99.2	99.5
Aug-18	0.354	0.39	378	961	304	768	2.9	8.9	2.8	8.6	99.2	99.1
Sep-18	0.372	0.41	305	870	309	889	3.3	9.8	2.8	8.5	98.9	99.1
Oct-18	0.440	0.20	322	1076	409	1467	2.5	9.7	2.3	9.2	99.1	99.4
Nov-18	0.552	0.18	251	955	202	887	3.6	16.3	4.0	19.9	98.2	89.1
Dec-18	0.922	0.14	148	970	152	1026	3.4	26.7	4.7	38.9	97.1	96.1

Month	Average Monthly Inflow (MGD)	Average Effluent Ammonia Conc. (mg/L)	Influent BOD Conc. (mg/L)	Influent BOD Loading (lb/day)	Influent TSS Conc. (mg/L)	Influent TSS Loading (lb/day)	Effluent BOD Conc. (mg/L)	Effluent BOD Loading (lb/day)	Effluent TSS Conc. (mg/L)	Effluent TSS Loading (lb/day)	BOD Removal (%)	TSS Removal (%)
Jan-19	0.839	0.02	139	884	164	1064	2.1	14.8	3.3	24.8	98.4	97.8
Feb-19	0.962	0.04	151	1061	175	1257	4.5	23.2	4.8	42.6	97.8	96.7
Mar-19	0.529	0.10	244	970	347	1430	3.6	15.6	3.8	17.0	98.4	98.9
Apr-19	0.851	0.14	179	1098	259	1605	2.9	19.9	4.3	32.1	98.3	98.1
Average	0.658	0.37	204	899	210	974	3.0	15.9	3.6	21.5	98.3	97.9
Min	0.269	0.02	96	621	28	528	0.8	3.9	1.0	5.2	95.1	89.1
Max	1.399	8.51	423	1576	475	2483	7.2	50.8	11.1	106.9	99.6	99.5
NPDES Limit	1.00	2.60	NA	895	NA	760	30.0	134.0	30.0	114.0	85.0	85.0

APPENDIX C

SEWER MODELING RESULTS

City of Buckley
Sewer System Flow Chart
Existing Peak Wet Weather Flow (GPM)

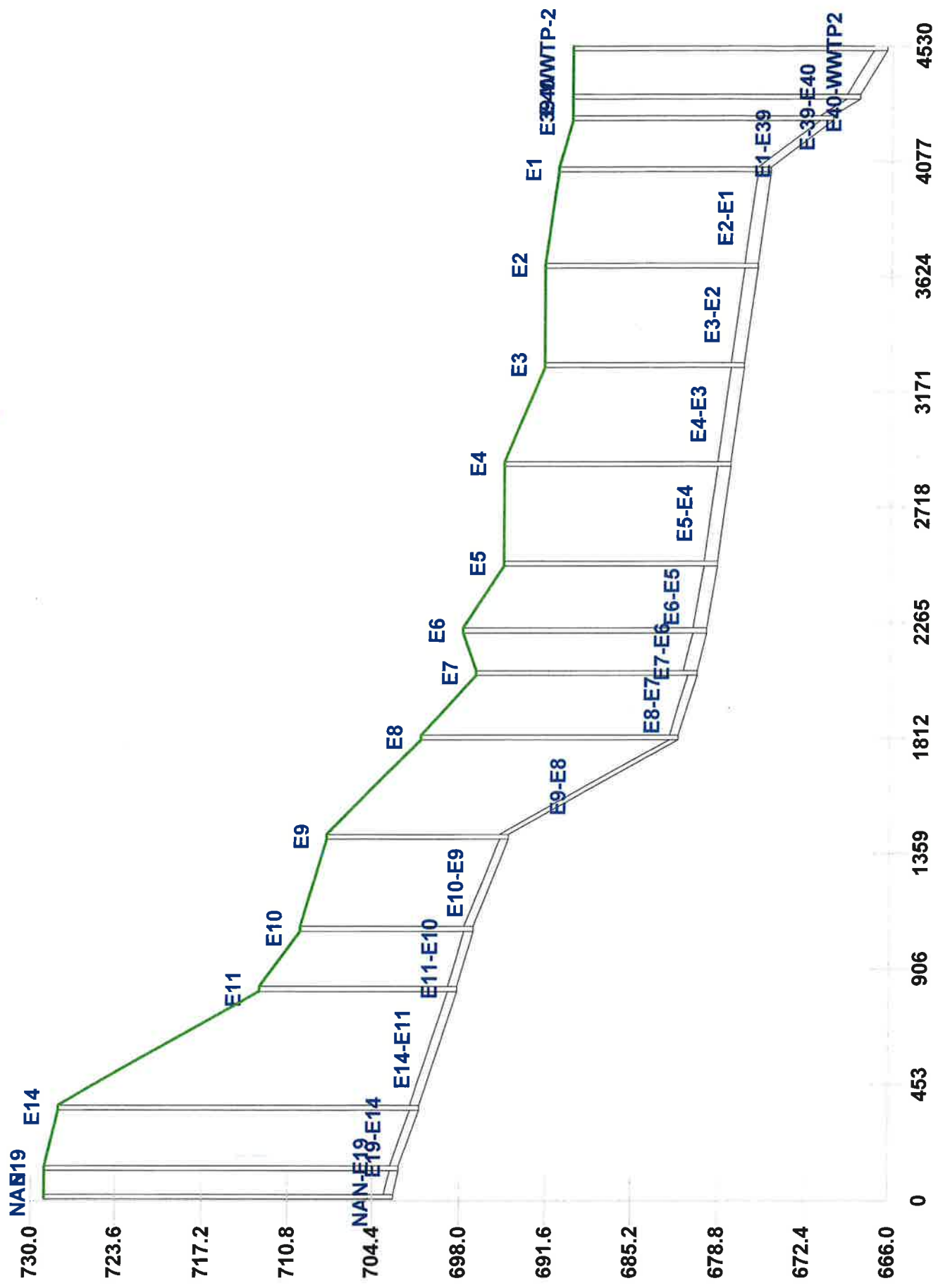


EXISTING CONDITIONS											
ID	From ID	To ID	Diameter (in)	Length (ft)	Slope	Flow (gpm)	Velocity (ft/s)	d/D	q/Q	Capacity (gpm)	
E40-WWTP2 E-39-E40 E1-E39	E40	WWTP-2	12	184	0.011	85.8	2.6	0.148	0.047	1,810.9	
	E39	E40	12	71	0.028	83.0	3.6	0.116	0.028	2,915.2	
	E1	E39	12	197	0.024	80.1	3.4	0.119	0.030	2,674.3	
	E2	E1	12	387	0.003	77.3	1.5	0.201	0.088	874.1	
	E3	E2	12	400	0.002	74.4	1.5	0.199	0.087	859.7	
	E4	E3	12	400	0.002	71.6	1.5	0.195	0.083	859.7	
	E5	E4	12	400	0.002	68.7	1.5	0.191	0.080	859.7	
	E6	E5	12	263	0.003	65.9	1.6	0.178	0.069	952.0	
	E7	E6	12	160	0.004	63.0	1.7	0.160	0.056	1,132.3	
	E8	E7	8	251	0.005	60.2	1.9	0.252	0.139	432.0	
E9-E8 E10-E9 E11-E10 E14-E11 E19-E14 NAN-E19	E8	E9	8	400	0.032	57.3	3.6	0.159	0.055	1,048.1	
	E9	E8	8	368	0.007	54.5	2.1	0.225	0.111	492.3	
	E10	E9	8	234	0.005	51.6	1.8	0.237	0.123	418.3	
	E11	E10	8	480	0.006	43.6	1.8	0.212	0.099	441.8	
	E14	E11	8	235	0.006	26.8	1.6	0.163	0.058	464.3	
	E19	E14	8	100	0.004	0.0	0.0	0.000	0.000	372.6	
	WWTP1-WWTP2 A1-WWTP1 A2-A1 A9-A2	WWTP-1	WWTP-2	18	35	0.733	1078.6	23.3	0.108	0.025	43,840.5
		A1	WWTP-1	18	80	0.025	1073.4	7.1	0.246	0.133	8,097.2
		A2	A1	18	268	0.004	1026.9	3.7	0.379	0.305	3,369.2
		A9	A2	18	365	0.013	1016.5	5.5	0.284	0.176	5,761.6
A10-A9 A11-A10 A12-A11 A13-A12 A14-A13		A9	A10	12	114	0.003	398.8	2.5	0.464	0.440	905.8
		A10	A11	12	479	0.005	381.8	3.2	0.375	0.299	1,274.8
		A11	A12	12	157	0.008	377.6	3.6	0.341	0.251	1,505.8
		A12	A13	12	371	0.005	369.7	3.1	0.371	0.293	1,262.5
		A13	A14	12	465	0.003	362.2	2.6	0.423	0.373	969.9
		A15-A14 A16-A15 A17-A16 A18-A17 A22-A18 A23-A22 PZ-A23	A14	A15	10	162	0.006	164.3	2.6	0.305	0.202
	A15		A16	10	358	0.007	160.8	2.7	0.291	0.185	870.9
	A16		A17	10	248	0.008	157.1	2.9	0.276	0.167	942.3
	A17		A18	10	130	0.005	153.3	2.4	0.303	0.200	766.8
	A18		A22	10	200	0.007	149.1	2.7	0.274	0.164	909.5
A22	A18		10	170	0.003	144.9	2.0	0.341	0.250	579.3	
A23	A22		10	100	0.004	0.0	0.0	0.000	0.000	675.6	
B1-A14 B2-B1 B3-B2 B4-B3 B5-B4 B27-B5 B29-B27 B28-B29 B38-B28 B39-B38 B47-B39 B48-B47 B50-B48 B51-B50 B55-B51 B56-B55 B57-B56 B64-B57 B71-B64 B72-B71 B74-B72 B75-B74 B76-B75 B77-B76 VSL-B77	A14		B1	10	157	0.018	194.1	4.1	0.248	0.135	1,436.6
	B1		B2	12	167	0.008	188.1	2.9	0.237	0.123	1,526.6
	B2		B3	12	469	0.000	184.0	0.6	0.768	0.937	196.5
	B3	B4	10	224	0.002	182.0	1.7	0.448	0.414	439.9	
	B4	B5	10	305	0.005	180.1	2.6	0.329	0.234	771.2	
	B5	B27	10	80	0.006	172.9	2.6	0.314	0.214	810.0	
	B27	B29	10	411	0.001	163.2	1.5	0.448	0.414	394.3	
	B29	B28	10	14	0.021	145.1	4.0	0.206	0.093	1,563.6	
	B28	B38	10	358	0.002	136.1	1.8	0.350	0.263	517.4	
	B38	B39	10	293	0.001	127.5	1.1	0.489	0.482	264.7	
B39-B38 B47-B39 B48-B47 B50-B48 B51-B50 B55-B51 B56-B55 B57-B56 B64-B57 B71-B64 B72-B71 B74-B72 B75-B74 B76-B75 B77-B76 VSL-B77	B39	B47	10	396	0.002	98.2	1.6	0.301	0.197	497.9	
	B47	B48	10	195	0.003	89.6	1.8	0.261	0.149	602.3	
	B48	B50	10	149	0.011	81.0	2.6	0.183	0.073	1,106.9	
	B50	B51	10	167	0.004	76.8	1.8	0.234	0.120	640.2	
	B51	B55	10	183	0.004	66.8	1.8	0.209	0.096	697.4	
	B55	B56	10	316	0.003	61.8	1.5	0.221	0.107	576.3	
	B56	B57	10	47	0.011	47.1	2.3	0.138	0.041	1,144.9	
	B57	B64	10	312	0.001	41.5	0.9	0.237	0.123	336.7	
	B64	B71	10	138	0.005	32.9	1.5	0.142	0.044	755.3	
	B71	B72	10	350	0.003	25.0	1.2	0.144	0.045	559.4	
B72-B71 B74-B72 B75-B74 B76-B75 B77-B76 VSL-B77	B72	B74	10	280	0.004	17.1	1.2	0.108	0.024	699.3	
	B74	B75	10	237	0.005	10.7	1.1	0.085	0.015	724.4	
	B75	B76	10	203	0.003	7.3	0.8	0.080	0.013	550.9	
	B76	B77	10	214	0.004	3.5	0.7	0.052	0.005	673.2	
	B77	VSL	10	100	0.004	0.0	0.0	0.000	0.000	675.6	
	C1-A9 C2-C1 C3-C2 C4-C3 C5-C4 C6-C5 C7-C6 C8-C7 C9-C8 C10-C9 C11-C10 C12-C11 C-25-C12 C15-C25 C16-C15 C26-C25 C31-C26 C32-C31 C33-C32 C39-C33 C40-C39 C45-C40 C52-C45 C72-C52	A9	C1	14	44	0.009	612.4	4.3	0.335	0.242	2,529.2
		C1	C2	14	144	0.011	608.3	4.5	0.323	0.226	2,691.9
		C2	C3	14	177	0.010	594.5	4.4	0.327	0.232	2,567.7
		C3	C4	14	148	0.012	593.1	4.7	0.311	0.211	2,816.3
		C4	C5	14	141	0.010	582.3	4.4	0.320	0.222	2,620.1
C5		C6	14	34	0.007	580.8	3.8	0.355	0.270	2,154.9	
C6		C7	14	144	0.008	576.1	3.9	0.344	0.254	2,269.0	
C7		C8	14	175	0.006	561.1	3.6	0.362	0.280	2,000.3	
C8		C9	14	320	0.007	547.5	3.7	0.344	0.255	2,147.6	
C9		C10	14	325	0.003	533.9	2.8	0.415	0.360	1,482.1	
C11-C10 C12-C11 C-25-C12 C15-C25 C16-C15 C26-C25 C31-C26 C32-C31 C33-C32 C39-C33 C40-C39 C45-C40 C52-C45 C72-C52	C10	C11	14	171	0.002	524.3	2.4	0.458	0.430	1,218.7	
	C11	C12	14	305	0.002	522.1	2.5	0.455	0.425	1,228.0	
	C12	C25	15	50	0.002	224.0	1.9	0.270	0.159	1,408.4	
	C25	C15	8	230	0.002	57.4	1.4	0.310	0.209	274.7	
	C15	C16	8	216	0.001	45.7	1.0	0.340	0.249	183.7	
	C26	C25	15	270	0.002	158.6	1.8	0.218	0.104	1,521.3	
	C31	C26	15	130	0.006	152.0	2.4	0.171	0.064	2,392.1	
	C32	C31	15	366	0.002	145.4	1.6	0.219	0.106	1,377.3	
	C33	C32	15	135	0.002	138.8	1.7	0.207	0.093	1,484.6	
	C39	C33	15	164	0.002	115.9	1.6	0.188	0.078	1,495.9	
C40-C39 C45-C40 C52-C45 C72-C52	C40	C39	15	163	0.002	108.9	1.5	0.186	0.076	1,438.3	
	C45	C40	15	304	0.002	89.1	1.4	0.171	0.064	1,399.1	
	C45	C52	15	306	0.002	73.6	1.3	0.159	0.055	1,335.2	
	C52	C45	15	284	0.005	56.7	1.7	0.111	0.026	2,163.3	
	A1-C12 B-1-A-1 C-1-B-1 D-1-C-1 E-1-D-1 F-1-E-1 G-1-F-1 H-1-G-1 I-1-H-1 J-1-I-1 K-1-J-1 L-1-K-1 M-1-L-1 M-2-M-1 N-1-M-2 O-1-N-1 P-1-O-1 Q-1-P-1 Q-2-Q-1 R-1-Q-1 S-1-R-1 T-1-S-1 PIPE-U-1-T-1 PIPE-V-1-U-1 PIPE-W-1-V-1 PIPE-X-1-W-1 PIPE-Y-1-X-1 PIPE-Z-1-Y-1 SHAY-Z-1	C12	A1	18	214	0.006	290.9	2.9	0.182	0.073	4,006.8
		A1	B-1	18	356	0.001	286.7	1.8	0.259	0.146	1,957.2
		B-1	C-								

PIPE LINK PROFILES
EXISTING CONDITIONS

Profile Plot of Links NAN-0.9, E19-E14, ..., E40-WWTP2

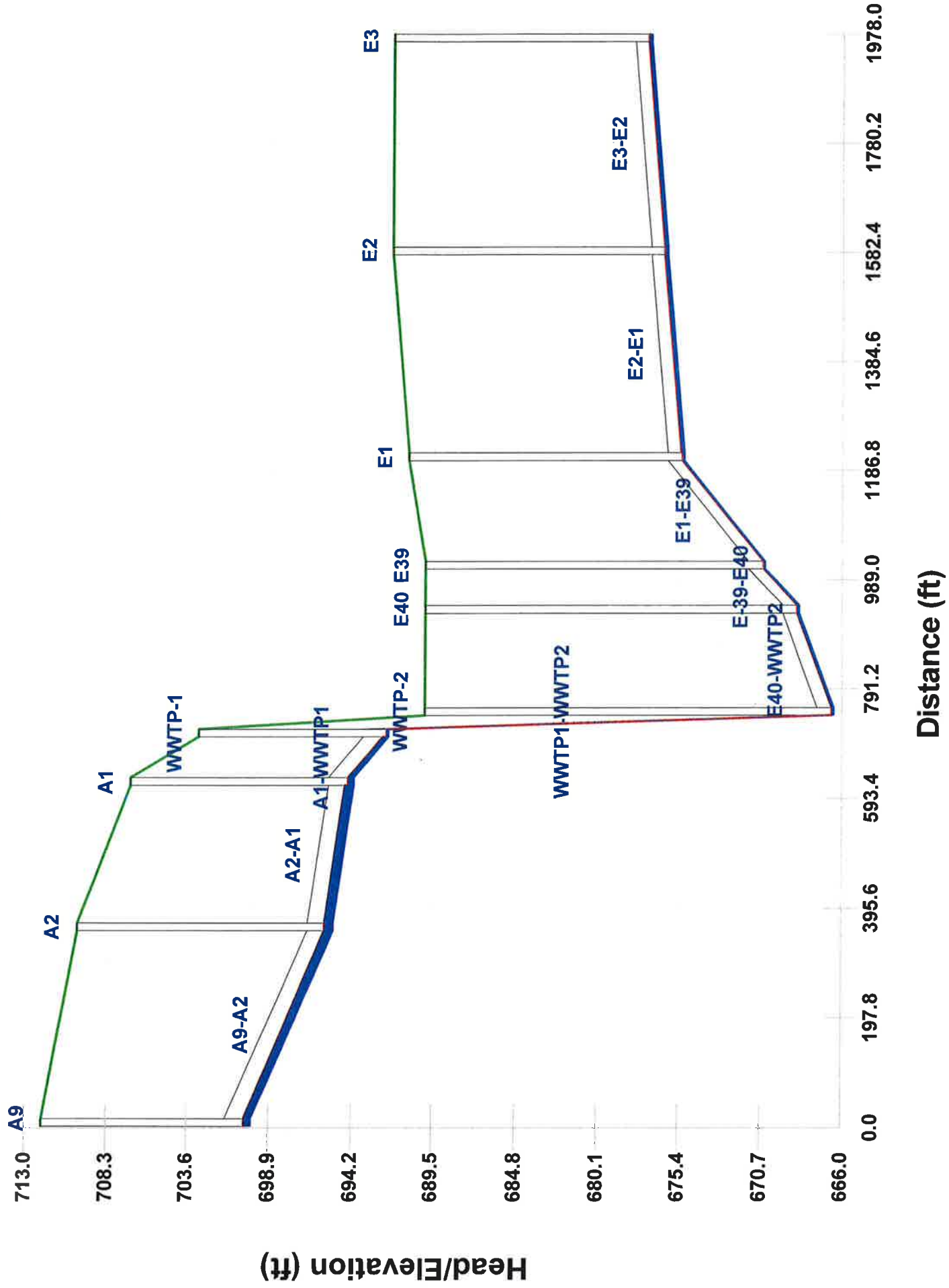
Link / Node / Initial Depth / Ground Level



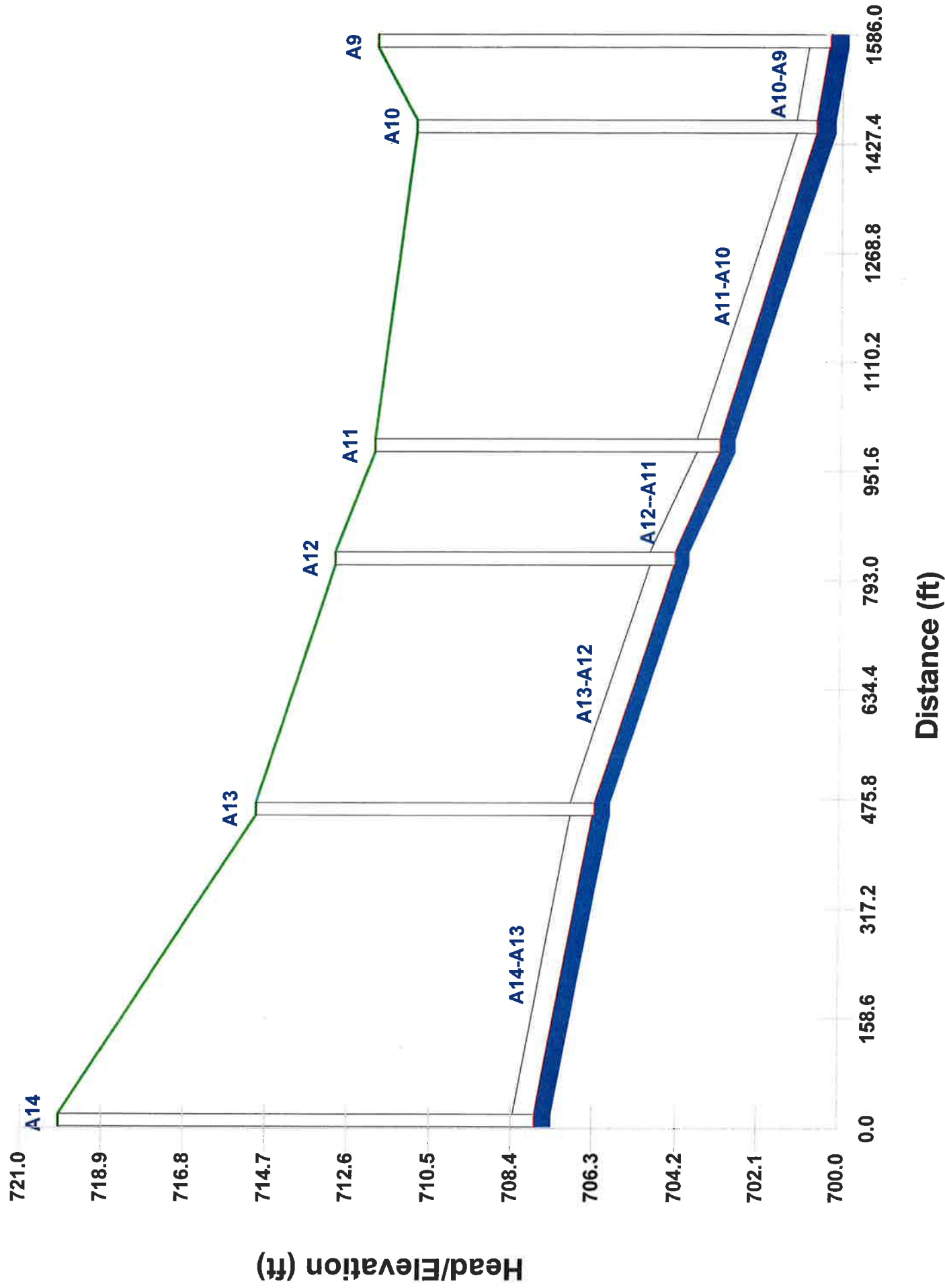
Distance (ft)

Steady-State HGL Profile of Links A9-A2, A2-A1, ..., E3-E2

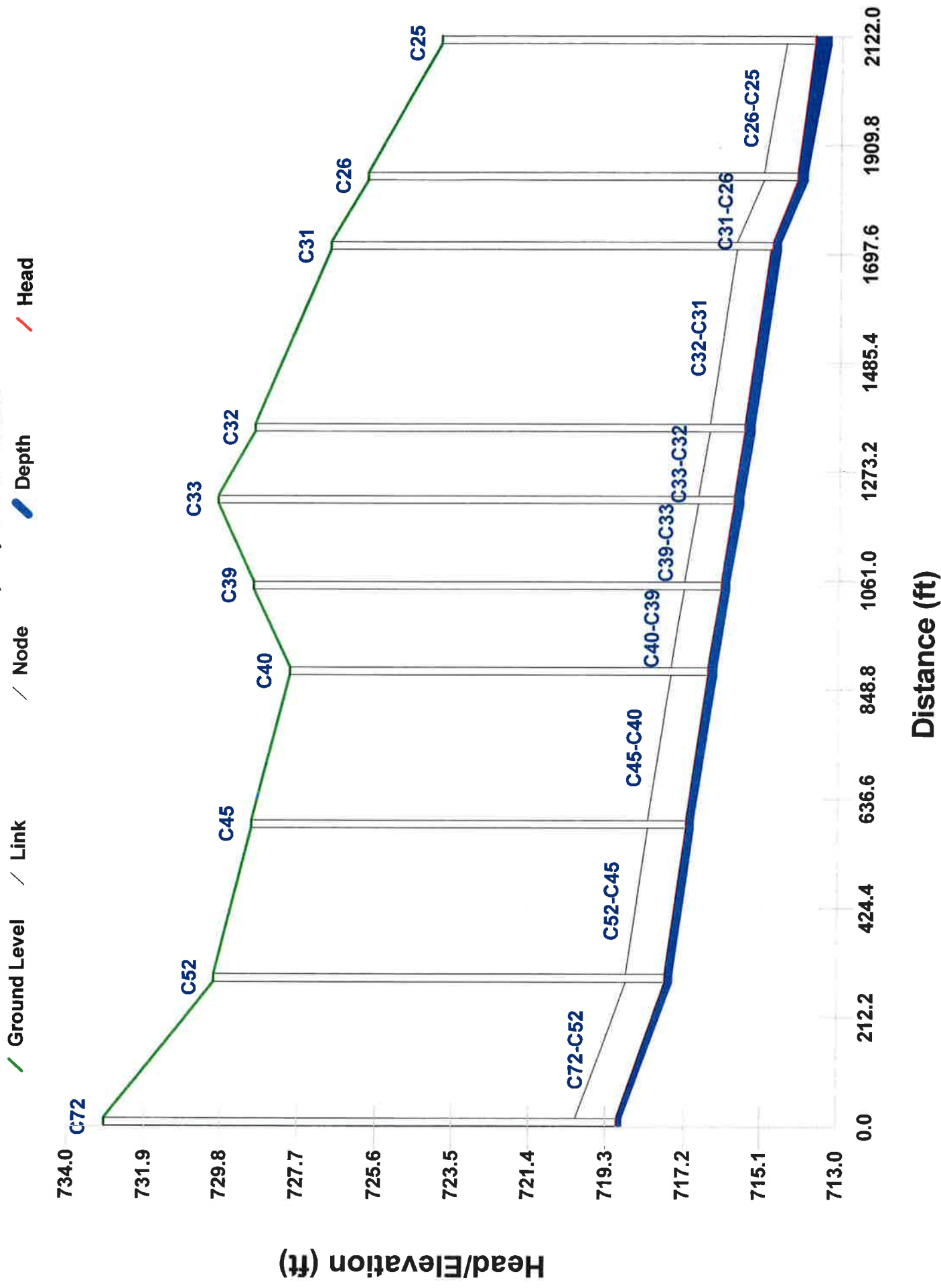
Ground Level / Link / Node / Depth / Head



Ready-State HGL Profile of Links A14-A13,A13-A12,...,A10-A9



Steady-State HGL Profile of Links C72-C52,C52-C45,...,C26-C25



Steady-State HGL Profile

Link(s)

C16-C15,C15-C25

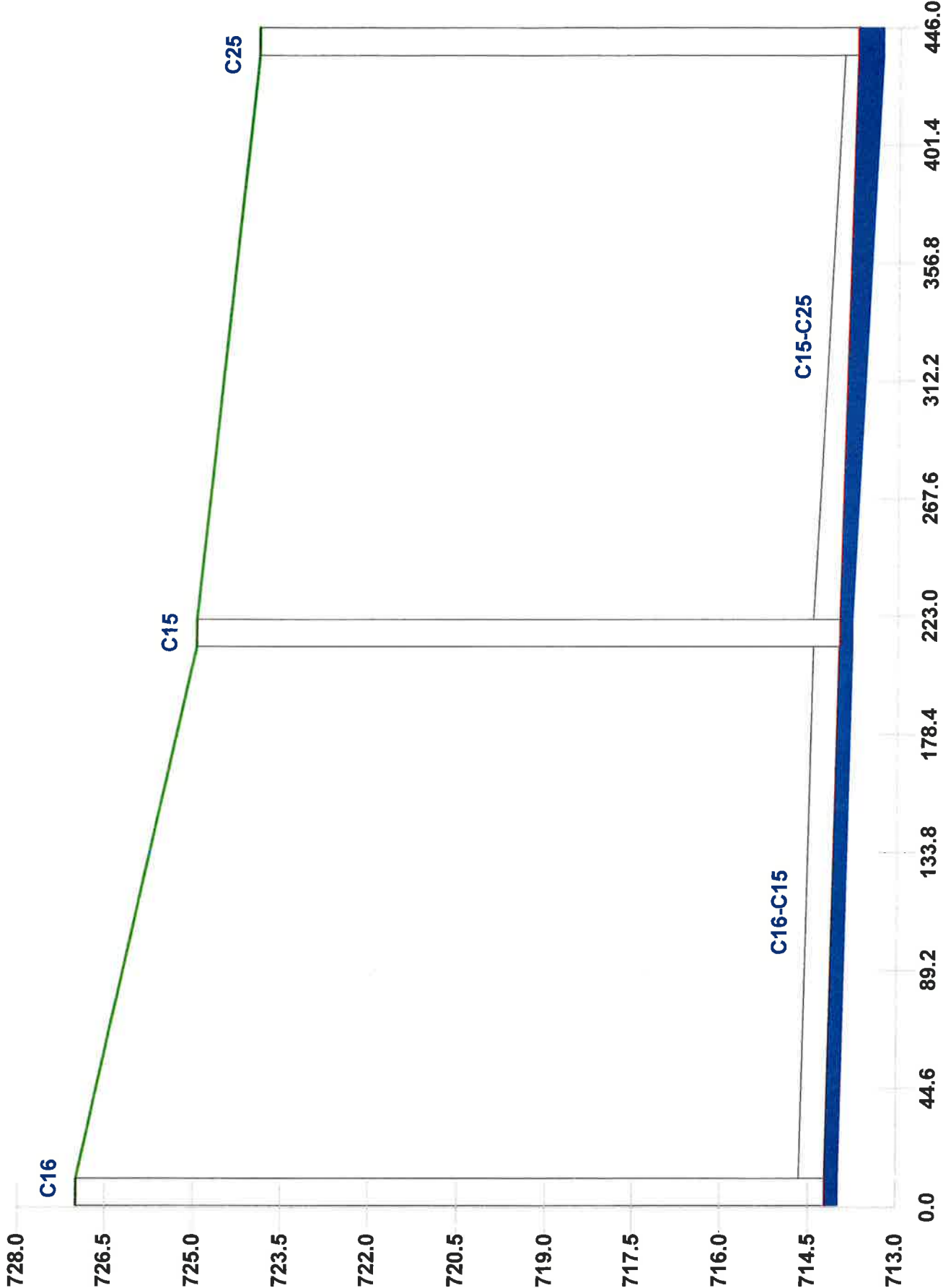
Ground Level

Link

Node

Depth

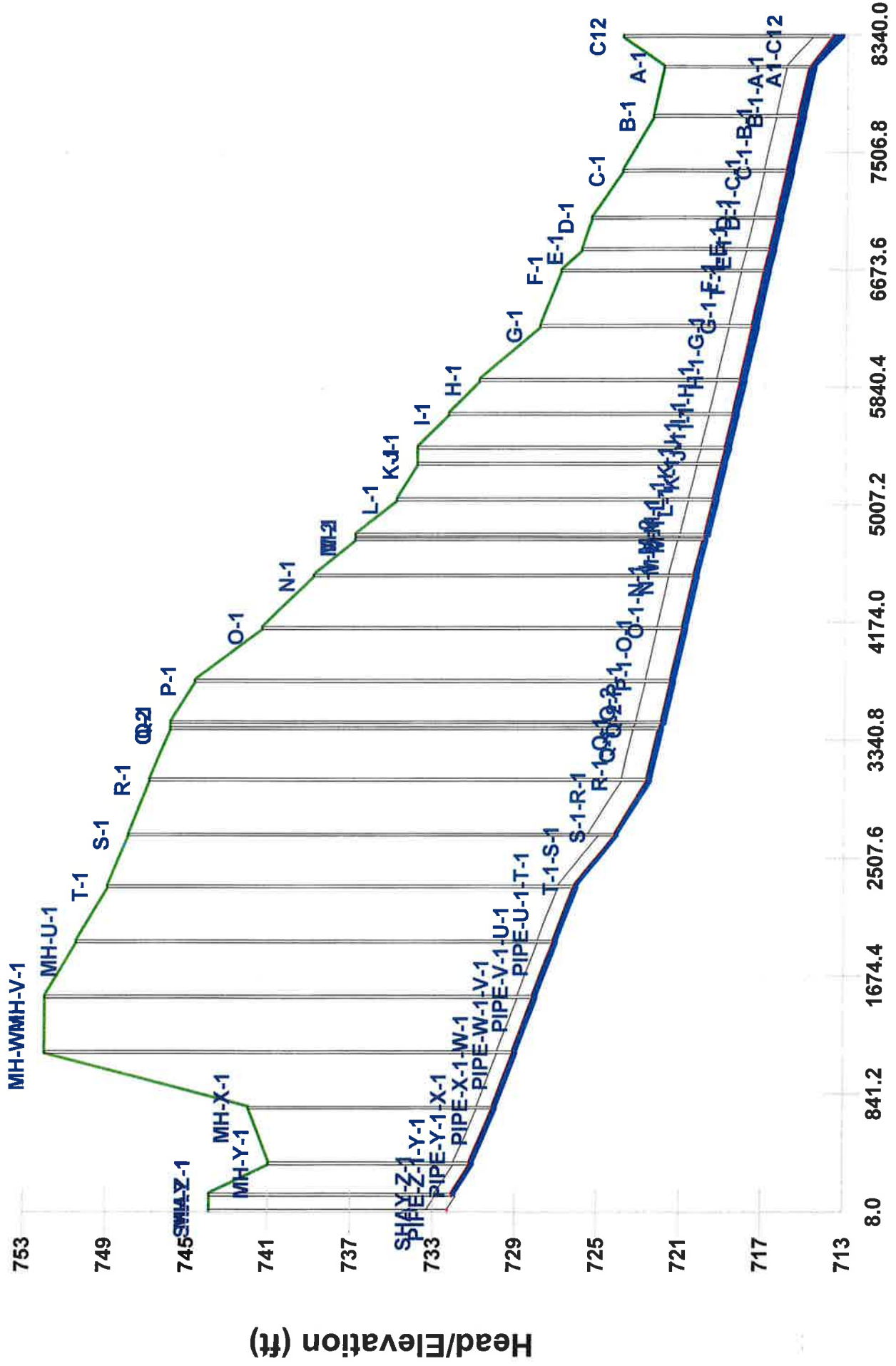
Head



Distance (ft)

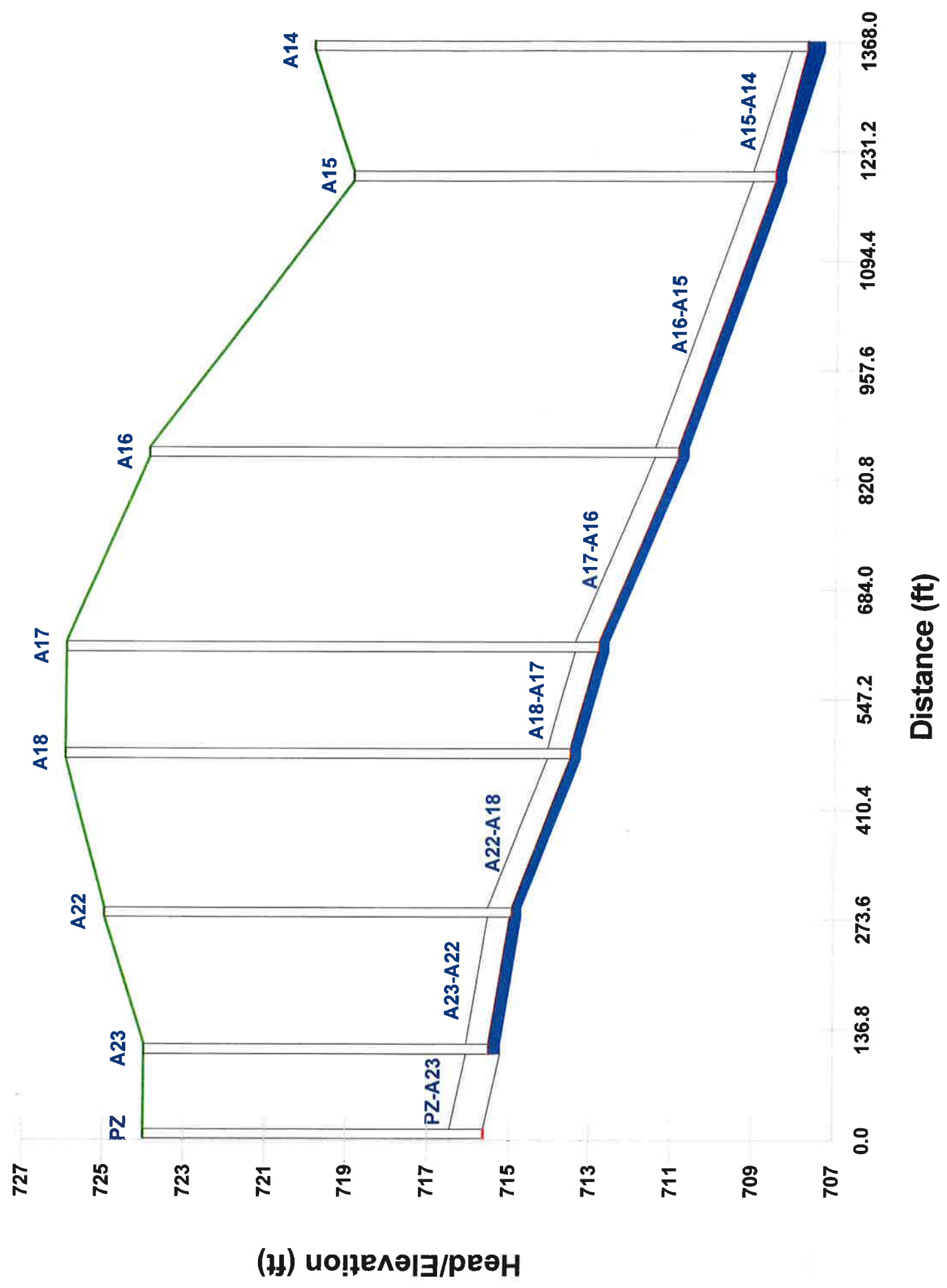
Steady-State HGL Profile of Links SHAY-Z-1,PIPE-Z-1-Y-1,,,,,A1-C12

Ground Level / Link / Node / Depth / Head



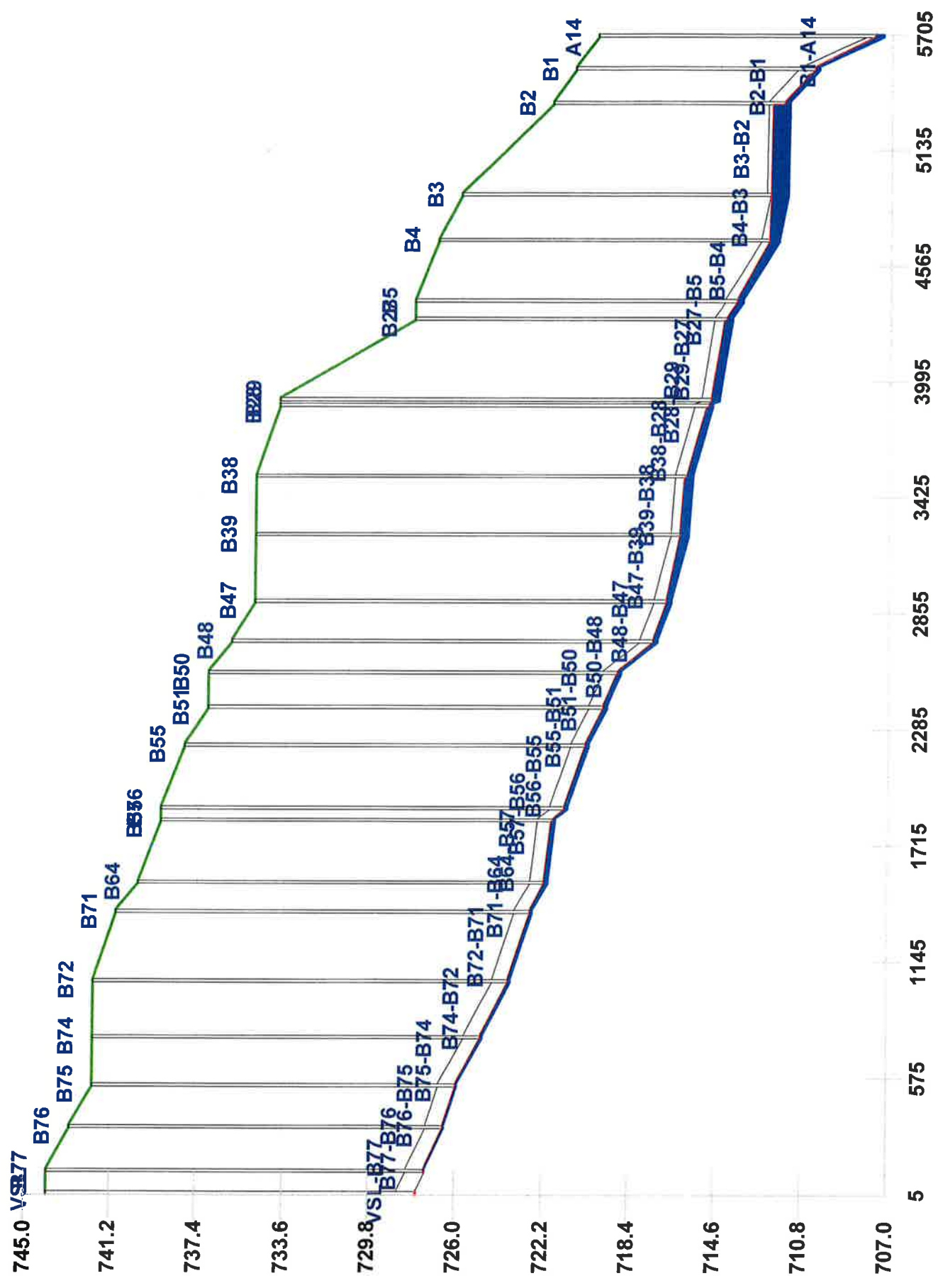
Distance (ft)

Steady-State HGL Profile of Links PZ-A23, A23-A22, ..., A15-A14



Steady-State HGL Profile of Los VSL-B77, B77-B76, ..., B1-A14

Ground Level / Link / Node / Depth / Head



Distance (ft)

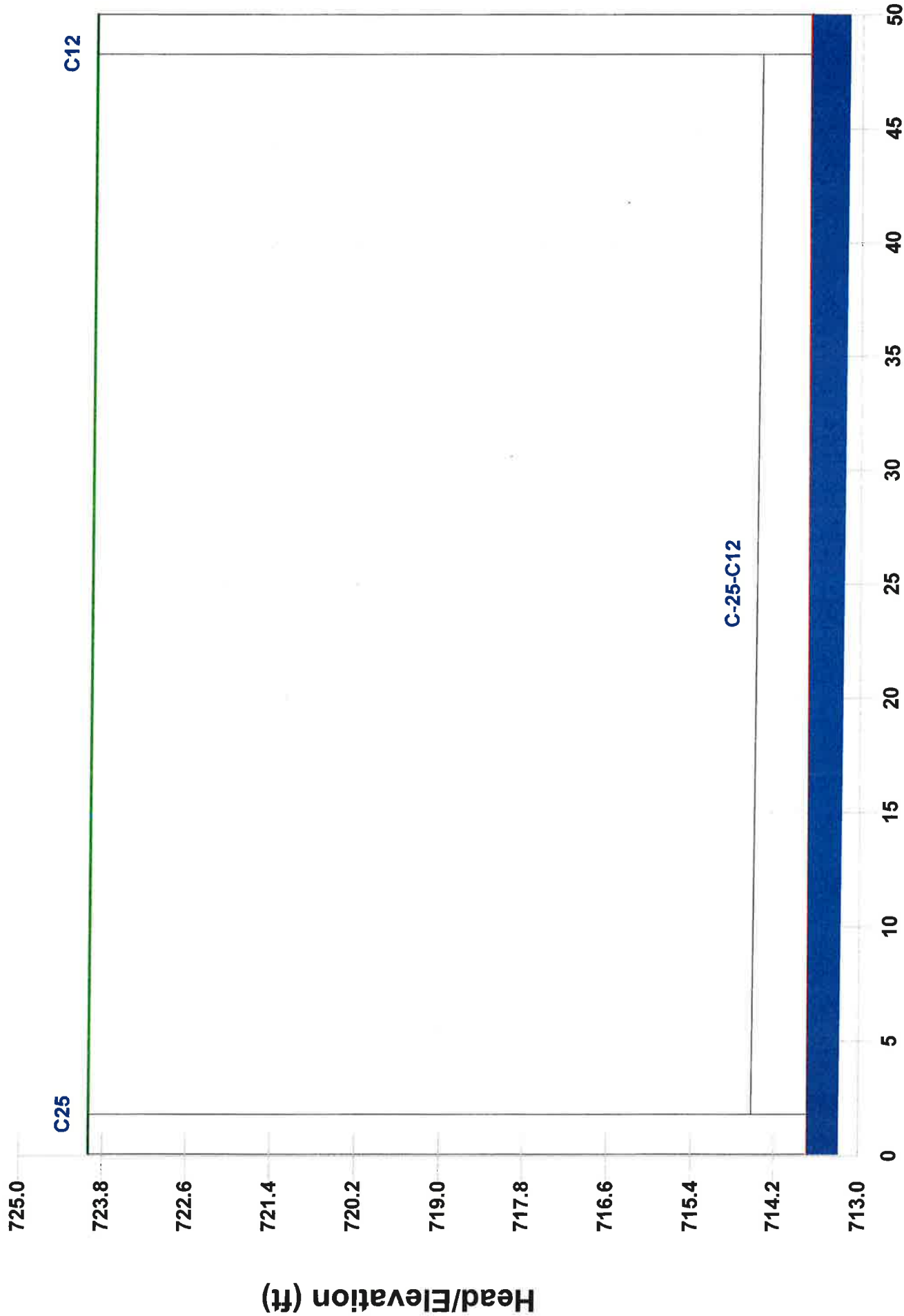
Steady-State HGL Profile of Link(s) C-25-C12

Ground Level / Link

Node

Depth

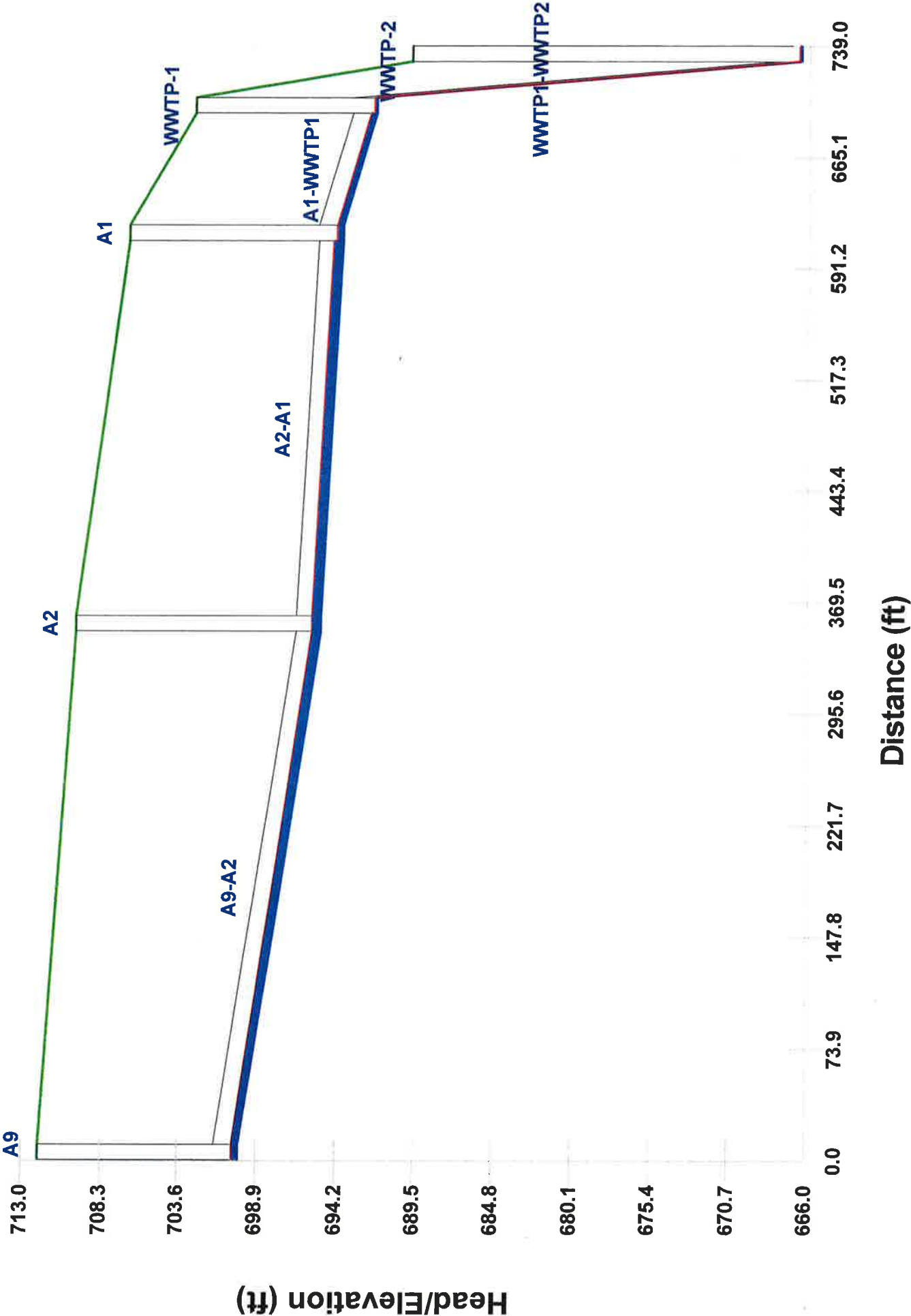
Head



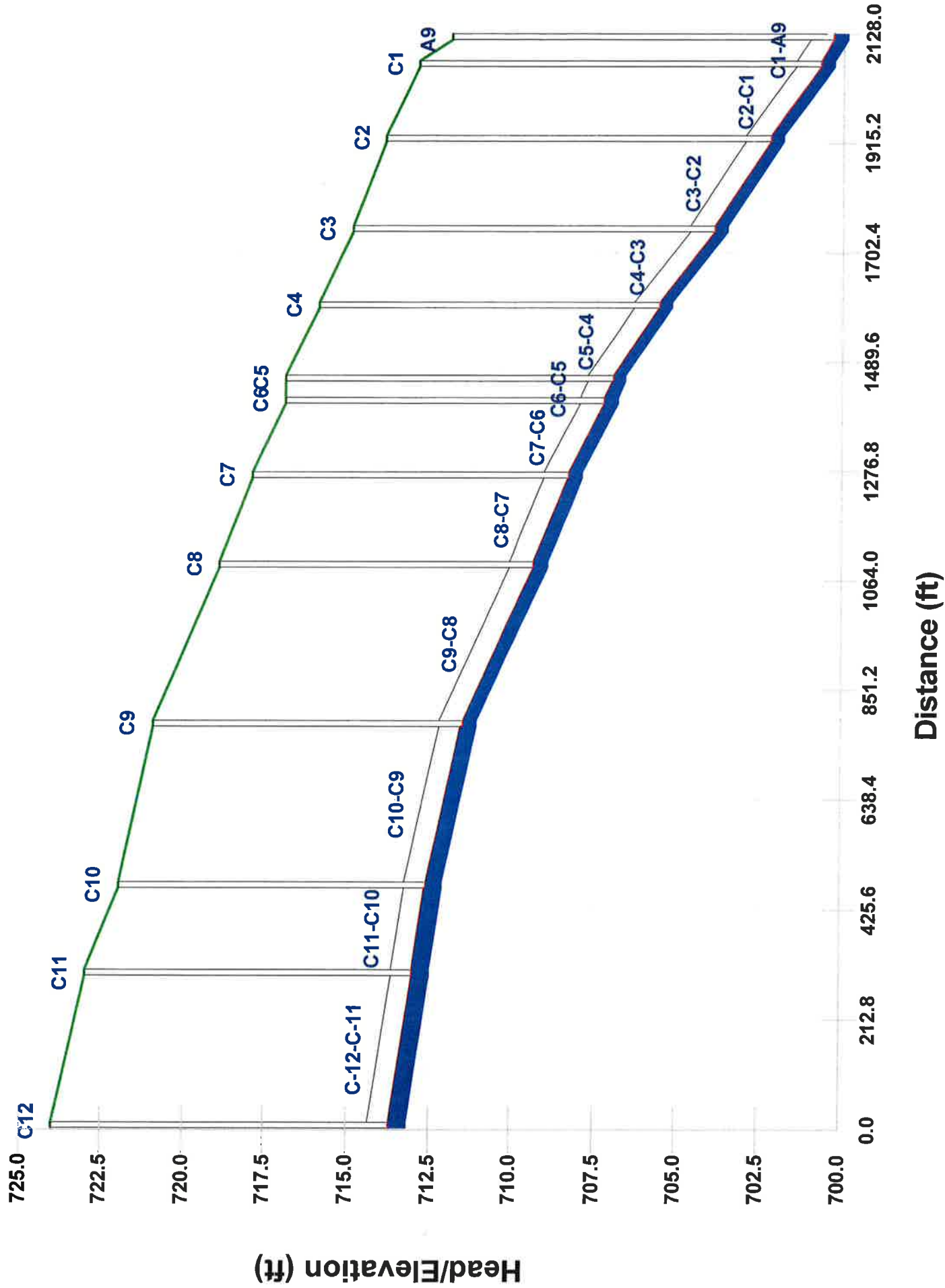
Distance (ft)

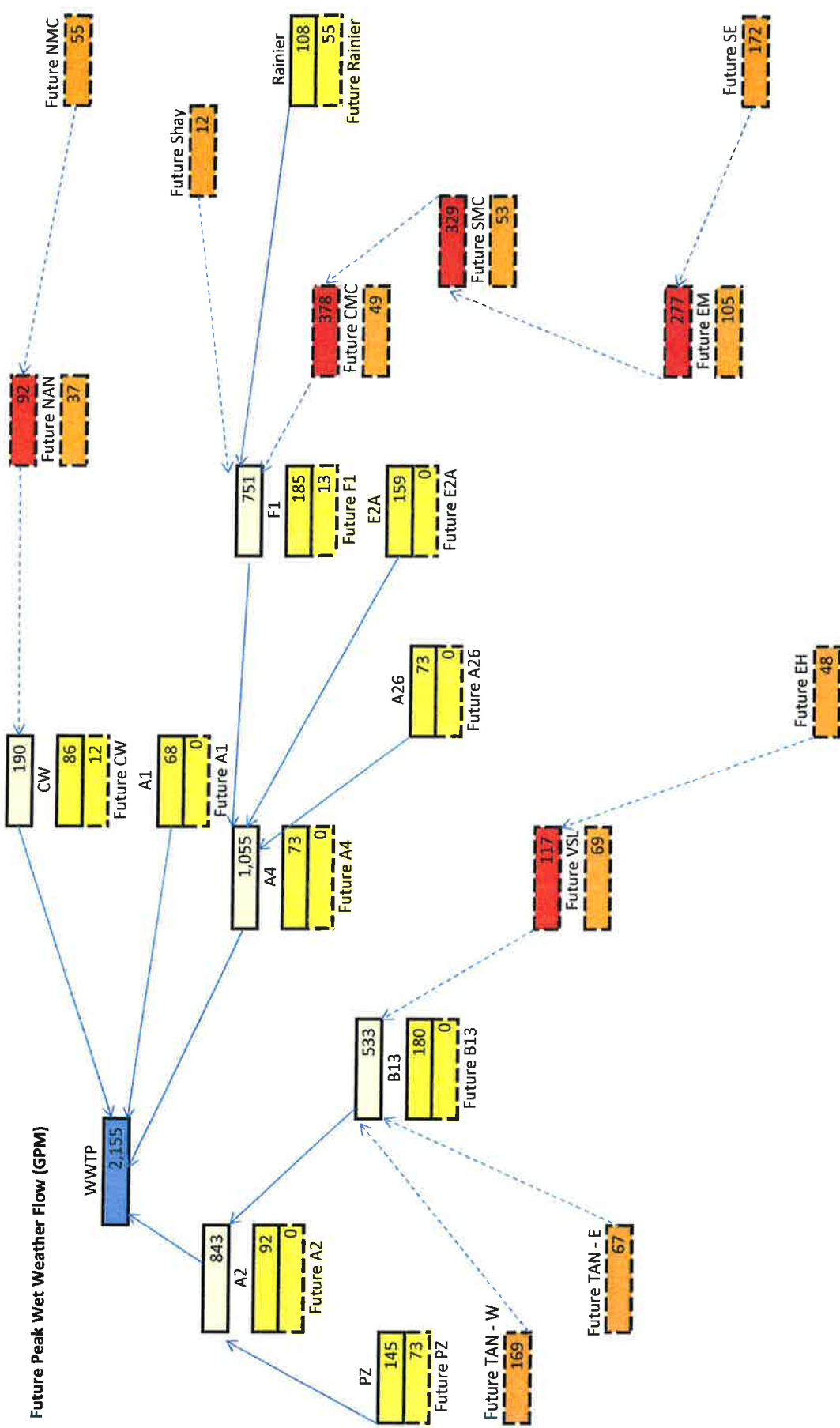
Steady-State HGL Profile of Links A9-A2,A2-A1,,,,,WWTP1-WWTP2

Ground Level / Link / Node / Depth / Head



Ready-State HGL Profile of Lines C-12-C-11, C-11-C-10, ..., C1-C2

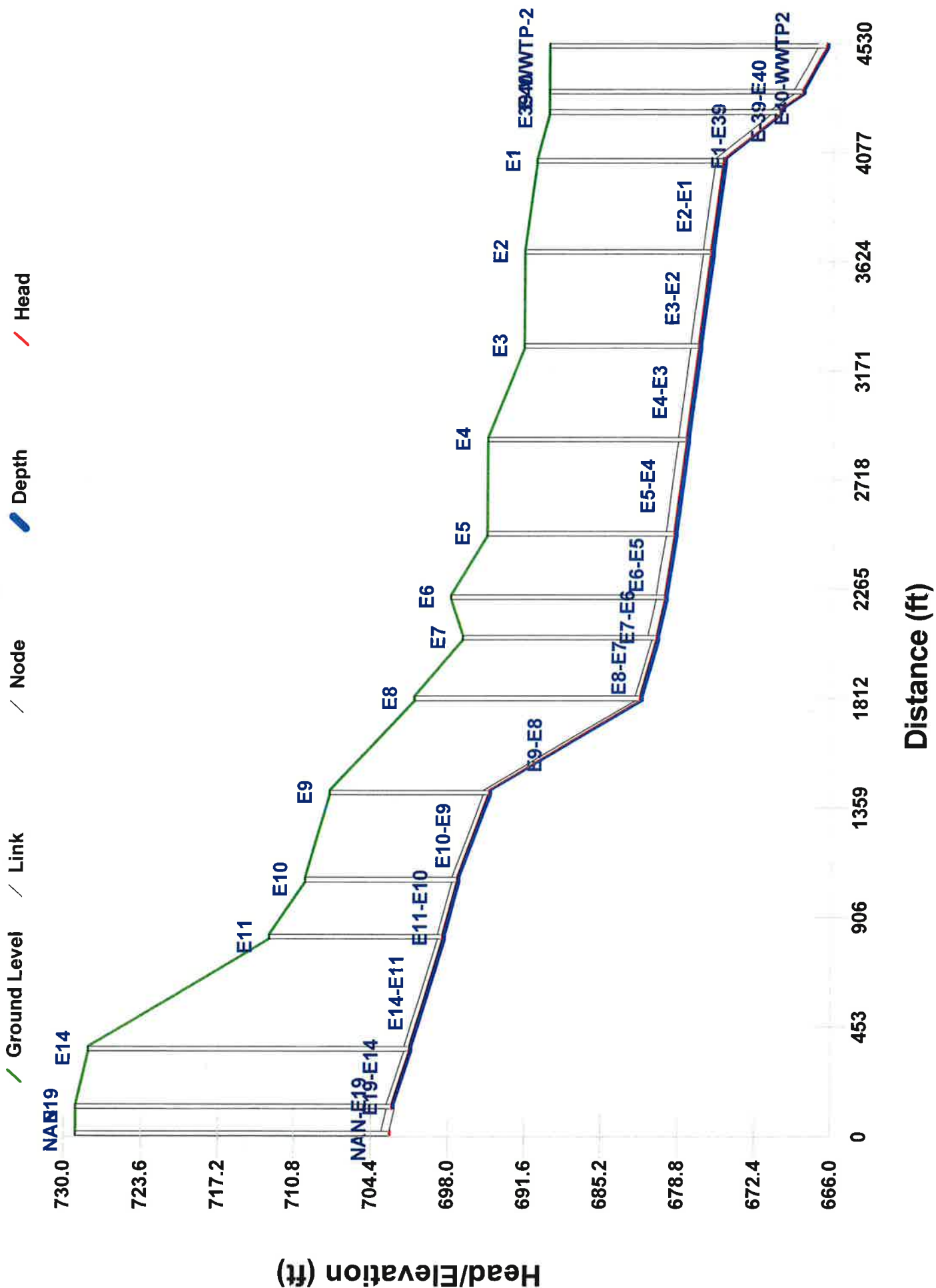




FUTURE CONDITIONS											
ID	From ID	To ID	Diameter (in)	Length (ft)	Slope	Flow (gpm)	Velocity (ft/s)	d/D	q/Q	Capacity (gpm)	
E40-WWTP2 E-39-E40 E1-E39	E40	WWTP-2	12	184	0.011	190.3	3.3	0.219	0.105	1,810.9	
	E39	E40	12	71	0.028	187.6	4.6	0.172	0.064	2,915.2	
	E1	E39	12	197	0.024	184.5	4.4	0.178	0.069	2,674.3	
	E2	E1	12	387	0.003	181.8	2.0	0.310	0.208	874.1	
	E3	E2	12	400	0.002	179.1	1.9	0.310	0.208	859.7	
	E4	E3	12	400	0.002	175.9	1.9	0.307	0.205	859.7	
	E5	E4	12	400	0.002	173.2	1.9	0.305	0.202	859.7	
	E6	E5	12	263	0.003	170.5	2.0	0.286	0.179	952.0	
	E7	E6	12	160	0.004	167.4	2.3	0.260	0.148	1,132.3	
	E8	E7	8	251	0.005	164.7	2.6	0.428	0.381	432.0	
E9-E8 E10-E9 E11-E10 E14-E11 E19-E14 NAN-E19	E9	E8	8	400	0.032	162.0	4.9	0.266	0.154	1,048.1	
	E10	E9	8	368	0.007	158.9	2.8	0.391	0.323	492.3	
	E11	E10	8	234	0.005	156.2	2.5	0.423	0.373	418.3	
	E14	E11	8	480	0.006	148.1	2.5	0.399	0.335	441.8	
	E19	E14	8	235	0.006	131.5	2.5	0.364	0.283	464.3	
	NAN	E19	8	100	0.004	104.6	2.0	0.362	0.281	372.6	
	WWTP1-WWTP2 A1-WWTP1 A2-A1 A9-A2	WWTP-1	WWTP-2	18	35	0.733	1961.7	27.9	0.144	0.045	43,840.5
		A1	WWTP-1	18	80	0.025	1956.8	8.4	0.335	0.242	8,097.2
		A2	A1	18	268	0.004	1910.1	4.4	0.539	0.567	3,369.2
		A9	A2	18	365	0.013	1899.8	6.5	0.395	0.330	5,761.6
A10-A9 A11-A10 A12-A11 A13-A12 A14-A13		A10	A9	12	114	0.003	824.9	2.9	0.749	0.911	905.8
		A11	A10	12	479	0.005	807.8	3.8	0.578	0.634	1,274.8
		A12	A11	12	157	0.008	803.4	4.3	0.520	0.534	1,505.8
		A13	A12	12	371	0.005	795.7	3.8	0.576	0.630	1,262.5
		A14	A13	12	465	0.003	788.1	3.1	0.684	0.813	969.9
		A15-A14 A16-A15 A17-A16 A18-A17 A22-A18 A23-A22 PZ-A23	A15	A14	10	162	0.006	237.4	2.9	0.370	0.292
	A16		A15	10	358	0.007	233.8	3.0	0.354	0.269	870.9
	A17		A16	10	248	0.008	230.2	3.2	0.337	0.244	942.3
	A18		A17	10	130	0.005	226.2	2.7	0.372	0.295	766.8
	A22		A18	10	200	0.007	222.2	3.1	0.337	0.244	909.5
A23	A22		10	170	0.003	218.1	2.2	0.425	0.377	579.3	
PZ	A23		10	100	0.004	73.2	1.8	0.222	0.108	675.6	
B1-A14 B2-B1 B3-B2 B4-B3 B5-B4 B27-B5 B29-B27 B28-B29 B38-B28 B39-B38 B47-B39 B48-B47 B50-B48 B51-B50 B55-B51 B56-B55 B57-B56 B64-B57 B71-B64 B72-B71 B74-B72 B75-B74 B76-B75 B77-B76 VSL-B77	B1		A14	10	157	0.018	547.1	5.5	0.428	0.381	1,436.6
	B2		B1	12	167	0.008	540.8	4.0	0.411	0.354	1,526.6
	B3		B2	12	469	0.000	536.8	1.5	1.000	2.732	196.5
	B4	B3	10	224	0.002	535.0	2.2	1.000	1.216	439.9	
	B5	B4	10	305	0.005	532.7	3.4	0.611	0.691	771.2	
	B27	B5	10	80	0.006	525.5	3.5	0.587	0.649	810.0	
	B29	B27	10	411	0.001	516.1	2.1	1.000	1.309	394.3	
	B28	B29	10	14	0.021	497.7	5.7	0.388	0.318	1,563.6	
	B38	B28	10	358	0.002	488.7	2.4	0.774	0.945	517.4	
	B39	B38	10	293	0.001	480.2	2.0	1.000	1.814	264.7	
B47-B39 B48-B47 B50-B48 B51-B50 B55-B51 B56-B55 B57-B56 B64-B57 B71-B64 B72-B71 B74-B72 B75-B74 B76-B75 B77-B76 VSL-B77	B47	B39	10	336	0.002	451.0	2.3	0.746	0.906	497.9	
	B48	B47	10	195	0.003	442.5	2.7	0.637	0.735	602.3	
	B50	B48	10	149	0.011	434.0	4.2	0.435	0.392	1,106.9	
	B51	B50	10	167	0.004	429.5	2.8	0.599	0.671	640.2	
	B55	B51	10	183	0.004	419.6	3.0	0.559	0.602	697.4	
	B56	B55	10	316	0.003	414.7	2.6	0.628	0.719	576.3	
	B57	B56	10	47	0.011	333.0	4.1	0.369	0.291	1,144.9	
	B64	B57	10	312	0.001	327.2	1.6	0.796	0.972	336.7	
	B71	B64	10	138	0.005	318.6	3.0	0.453	0.422	755.3	
	B72	B71	10	350	0.003	311.0	2.3	0.533	0.556	559.4	
B74-B72 B75-B74 B76-B75 B77-B76 VSL-B77	B74	B72	10	280	0.004	302.9	2.8	0.460	0.433	699.3	
	B75	B74	10	237	0.005	296.7	2.8	0.446	0.409	724.4	
	B76	B75	10	203	0.003	293.1	2.3	0.519	0.532	550.9	
	B77	B76	10	214	0.004	289.5	2.6	0.458	0.423	673.2	
	VSL	B77	10	100	0.004	285.9	2.6	0.454		675.6	
	C1-A9 C2-C1 C3-C2 C4-C3 C5-C4 C6-C5 C7-C6 C8-C7 C9-C8 C10-C9 C11-C10 C-12-C-11 C-25-C12	C1	A9	14	44	0.009	1069.5	5.1	0.454	0.423	2,529.2
		C2	C1	14	144	0.011	1065.5	5.3	0.437	0.396	2,691.9
		C3	C2	14	177	0.010	1052.0	5.1	0.446	0.410	2,567.7
		C4	C3	14	148	0.012	1050.2	5.4	0.423	0.373	2,816.3
		C5	C4	14	141	0.010	1039.4	5.1	0.438	0.397	2,620.1
C6		C5	14	94	0.007	1038.1	4.5	0.489	0.482	2,154.9	
C7		C6	14	144	0.008	1033.1	4.6	0.474	0.455	2,269.0	
C8		C7	14	175	0.006	1018.3	4.2	0.505	0.509	2,000.3	
C9		C8	14	320	0.007	1004.9	4.4	0.481	0.468	2,147.6	
C10		C9	14	325	0.003	991.0	3.3	0.598	0.669	1,482.1	
C15-C25 C16-C15 C26-C25 C31-C26 C32-C31 C33-C32 C39-C33 C40-C39 C45-C40 C52-C45 C72-C52	C11	C10	14	171	0.002	981.5	2.8	0.680	0.805	1,218.7	
	C12	C11	14	305	0.002	979.3	2.8	0.675	0.798	1,228.0	
	C25	C12	15	50	0.002	224.4	1.9	0.270	0.159	1,408.4	
	C15	C25	8	230	0.002	57.4	1.4	0.310	0.209	274.7	
	C16	C15	8	216	0.001	45.8	1.0	0.340	0.249	183.7	
	C26	C25	15	270	0.002	158.9	1.8	0.218	0.105	1,521.3	
	C31	C26	15	130	0.006	152.6	2.4	0.171	0.064	2,392.1	
	C32	C31	15	366	0.002	145.9	1.6	0.220	0.106	1,377.3	
	C33	C32	15	135	0.002	139.1	1.7	0.207	0.094	1,484.6	
	C39	C33	15	164	0.002	116.2	1.6	0.189	0.078	1,495.9	
C40-C39 C45-C40 C52-C45 C72-C52	C40	C39	15	163	0.002	109.5	1.5	0.187	0.076	1,438.3	
	C45	C40	15	304	0.002	89.3	1.4	0.171	0.064	1,399.1	
	C52	C45	15	306	0.002	74.1	1.3	0.160	0.055	1,335.2	
	C72	C52	15	284	0.005	57.0	1.7	0.112	0.026	2,163.3	
	A1-C12 B-1-A-1 C-1-B-1 D-1-C-1 E-1-D-1 F-1-E-1 G-1-F-1 H-1-G-1 I-1-H-1 J-1-I-1 K-1-J-1 L-1-K-1 M-1-L-1 M-2-M-1 N-1-M-2 O-1-N-1 P-1-O-1 Q-2-P-1 Q-1-Q-2 R-1-Q-1 S-1-R-1 T-1-S-1 PIPE-U-1-T-1 PIPE-V-1-U-1 MH-W-1 MH-X-1 MH-Y-1 MH-Z-1 SHAY	A-1	C12	18	214	0.006	747.7	3.9	0.293	0.187	4,006.8
		B-1	A-1	18	356	0.001	743.7	2.3	0.427	0.380	1,957.2
		C-1	B-1	18	394	0.001	725.3	2.3	0.421	0.369	1,964.9
		D-1	C-1	18	340	0.002	720.3	2.3	0.417	0.363	1,983.4
		E-1	D-1	18	220	0.002	717.6	2.4	0.406	0.347	2,071.6
		F-1	E-1	18	141	0.002	714.9	2.5	0.388	0.319	2,241.0
G-1		F-1	18	400	0.001	705.1	2.3	0.416	0.362	1,950.1	
H-1		G-1	18	393	0.001	696.1	2.3	0.411	0.354	1,967.4	
I-1		H-1	18	238	0.002	689.4	2.3	0.400	0.337	2,046.3	
J-1		I-1	18	238	0.002	678.1	2.3	0.399	0.336	2,019.2	
K-1-J-1 L-1-K-1 M-1-L-1 M-2-M-1 N-1-M-2 O-1-N-1 P-1-O-1 Q-2-P-1 Q-1-Q-2 R-1-Q-1 S-1											

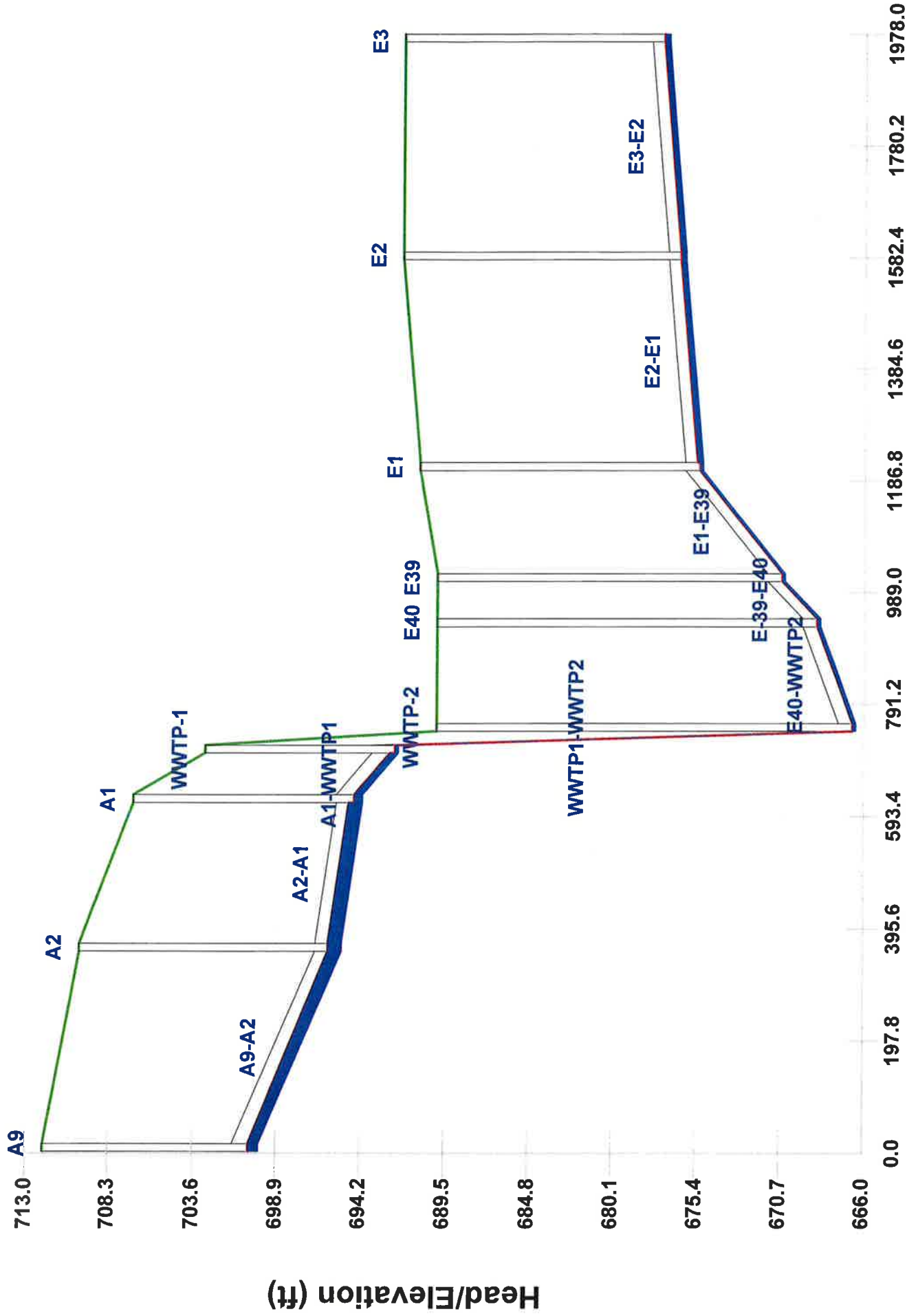
PIPE LINK PROFILES
FUTURE CONDITIONS

Steady-State HGL Profile of Links NAN-E19,E19-E14,....,E40-WWTP2



Steady-State HGL Profile of Links A9-A2,A2-A1,,,,,E3-E2

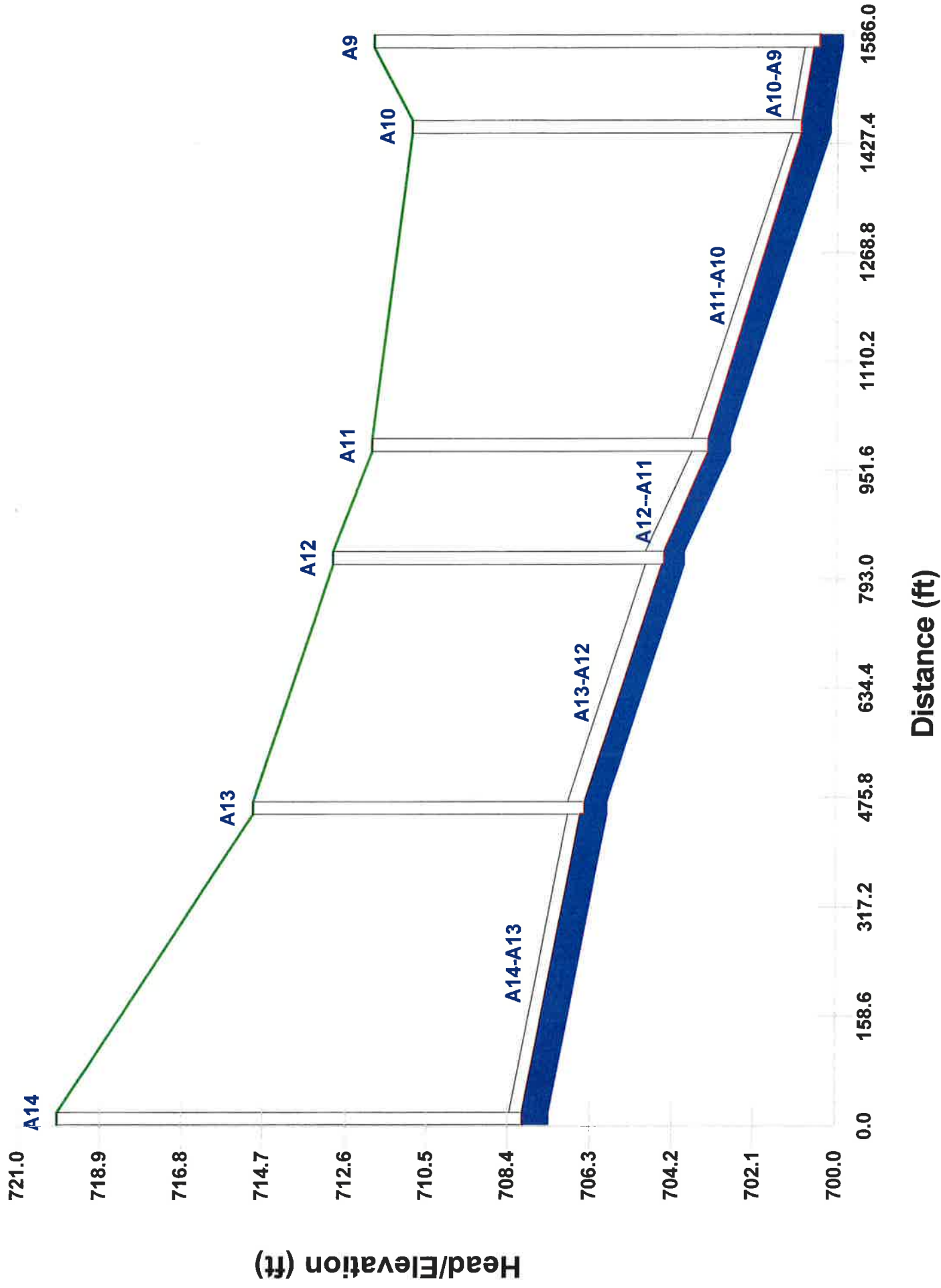
Ground Level / Link / Node / Depth / Head



Distance (ft)

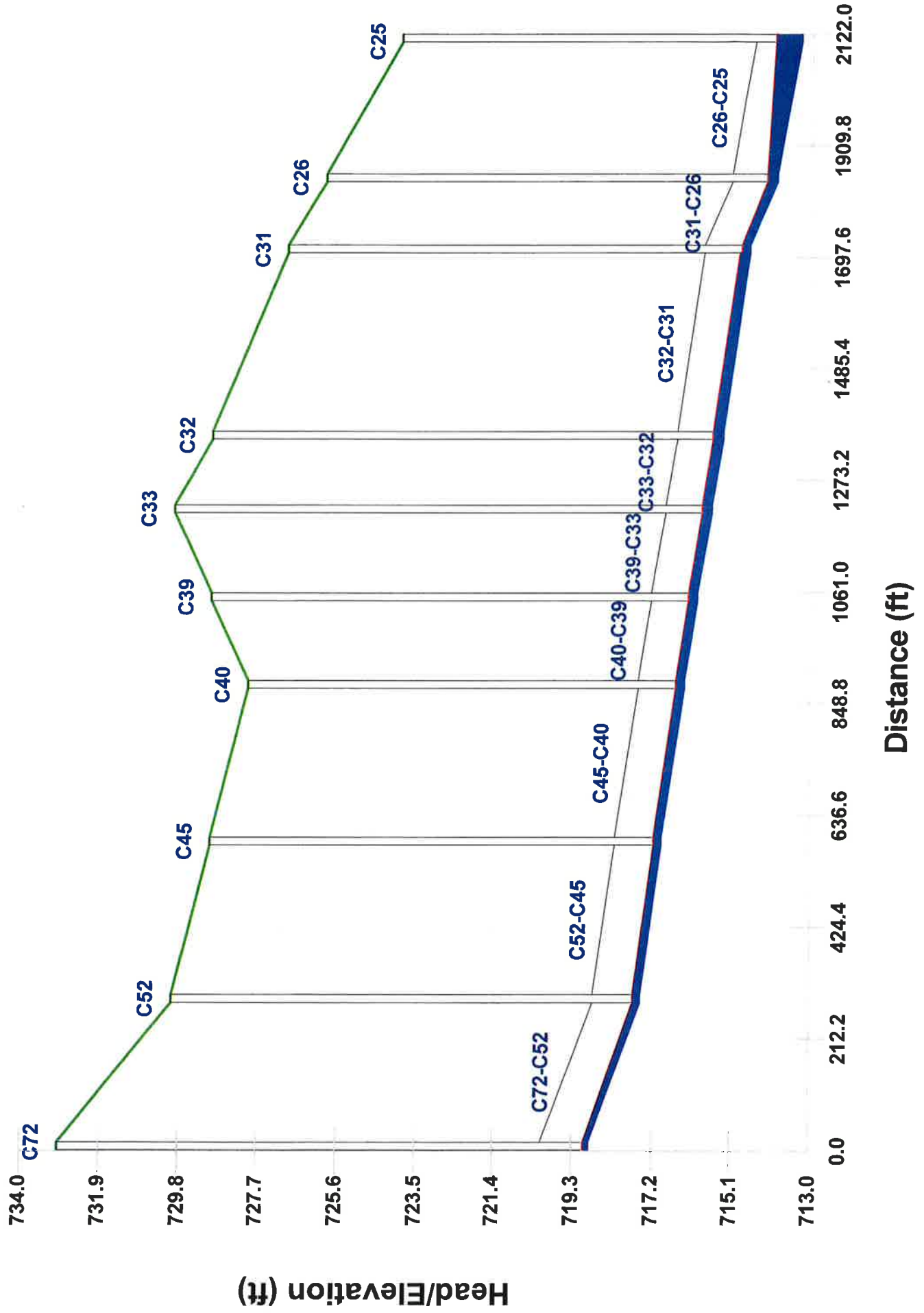
Steady-State HGL Profile of Links A14-A13, A13-A12, ..., A10-A9

Ground Level / Link / Node / Depth / Head



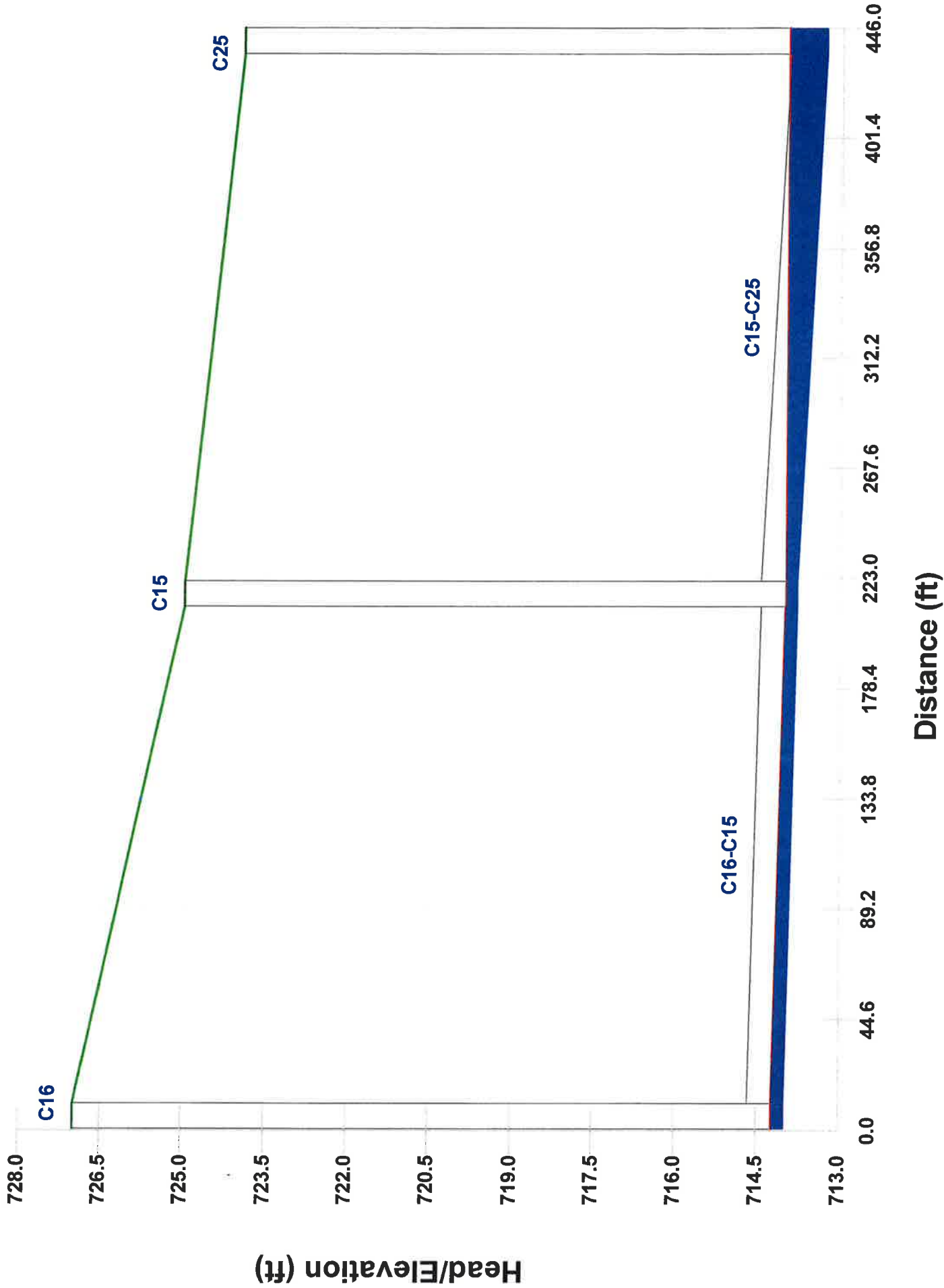
Steady-State HGL Profile of Links C72-C52,C52-C45,...,C26-C25

Ground Level / Link / Node / Depth / Head



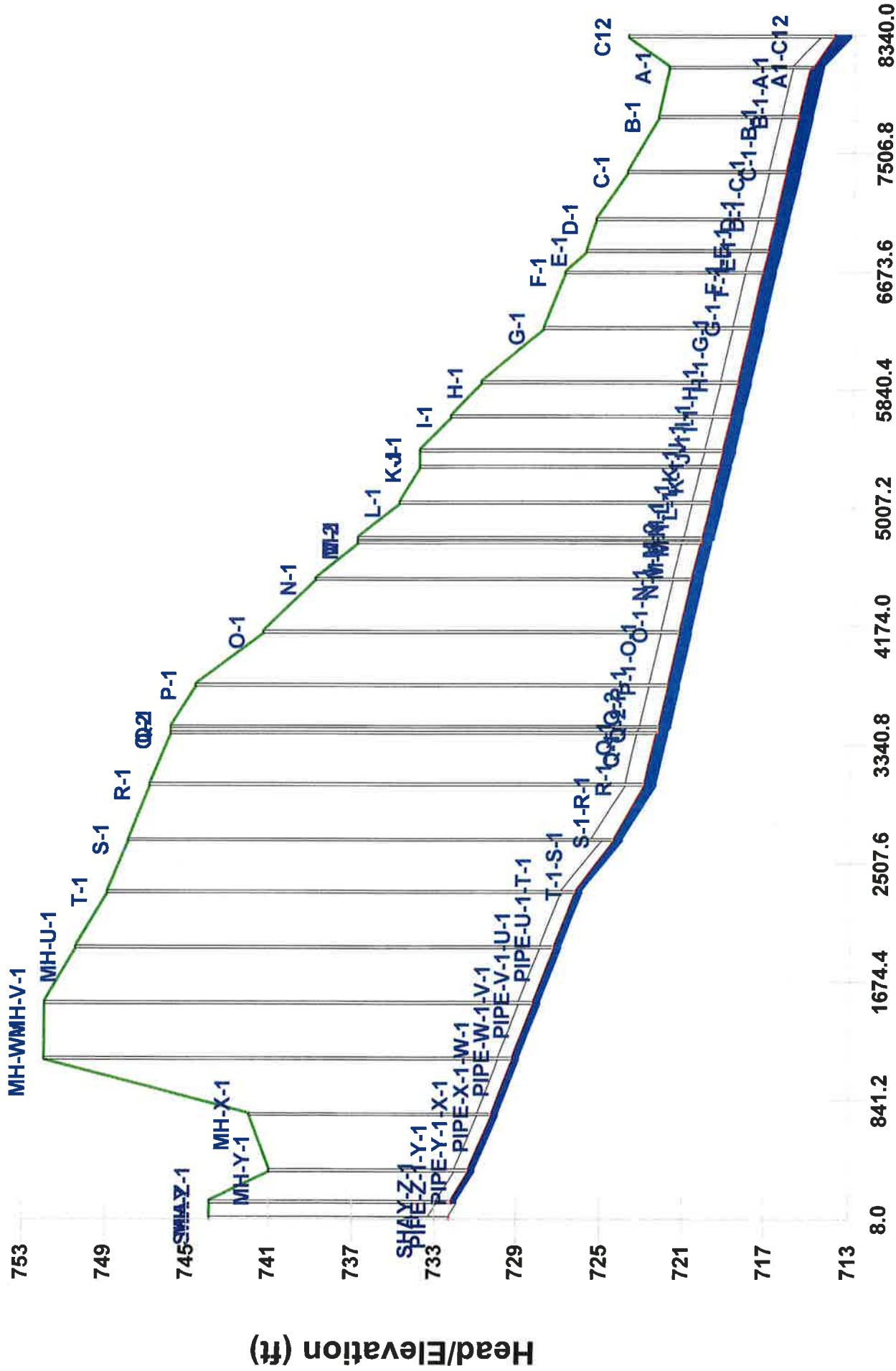
Steady-State HGL Profile () Link(s) C16-C15,C15-C25

Ground Level / Link / Node / Depth / Head



Steady-State HGL Profile of Links SHAY-Z-1, PIPE-Z-1-Y-1, ..., A1-C12

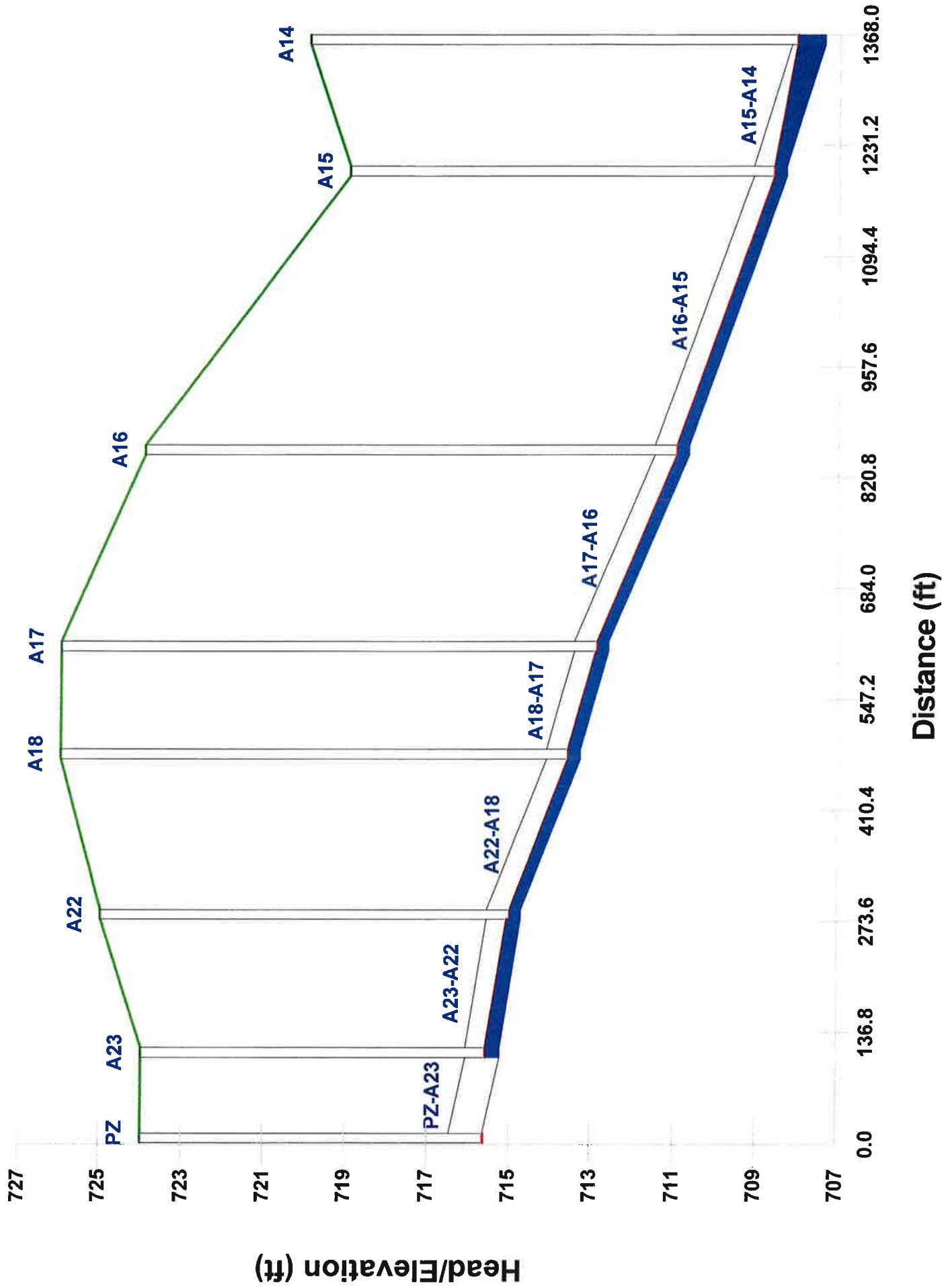
Ground Level / Link / Node / Depth / Head



Distance (ft)

Ready-State HGL Profile of Links PZ-A23, A23-A22, ..., A15-A14

Ground Level / Link / Node / Depth / Head



B1-A



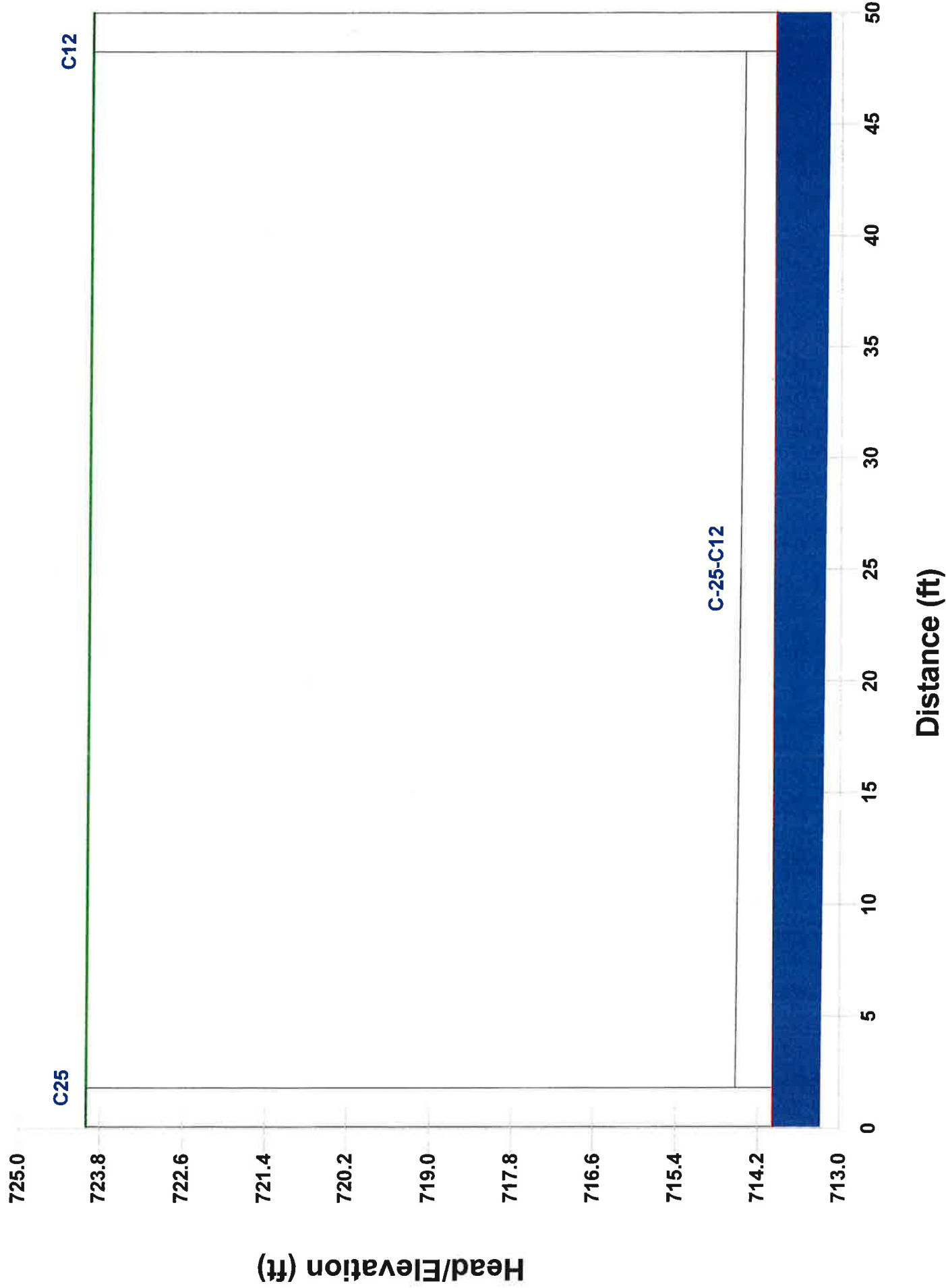
Steady-State HGL Profile of Link(s) C-25-C12

Ground Level / Link

Node

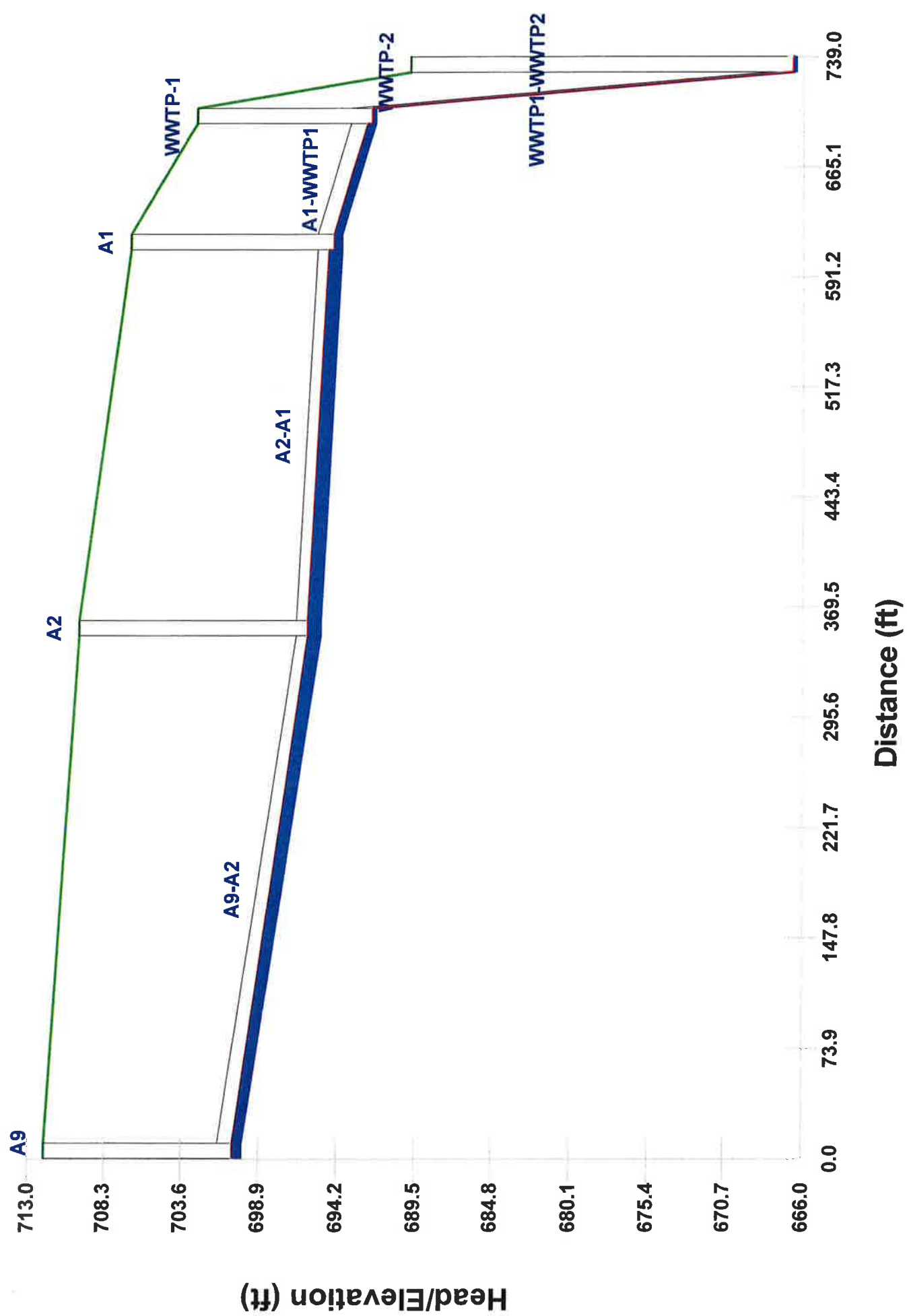
Depth

Head



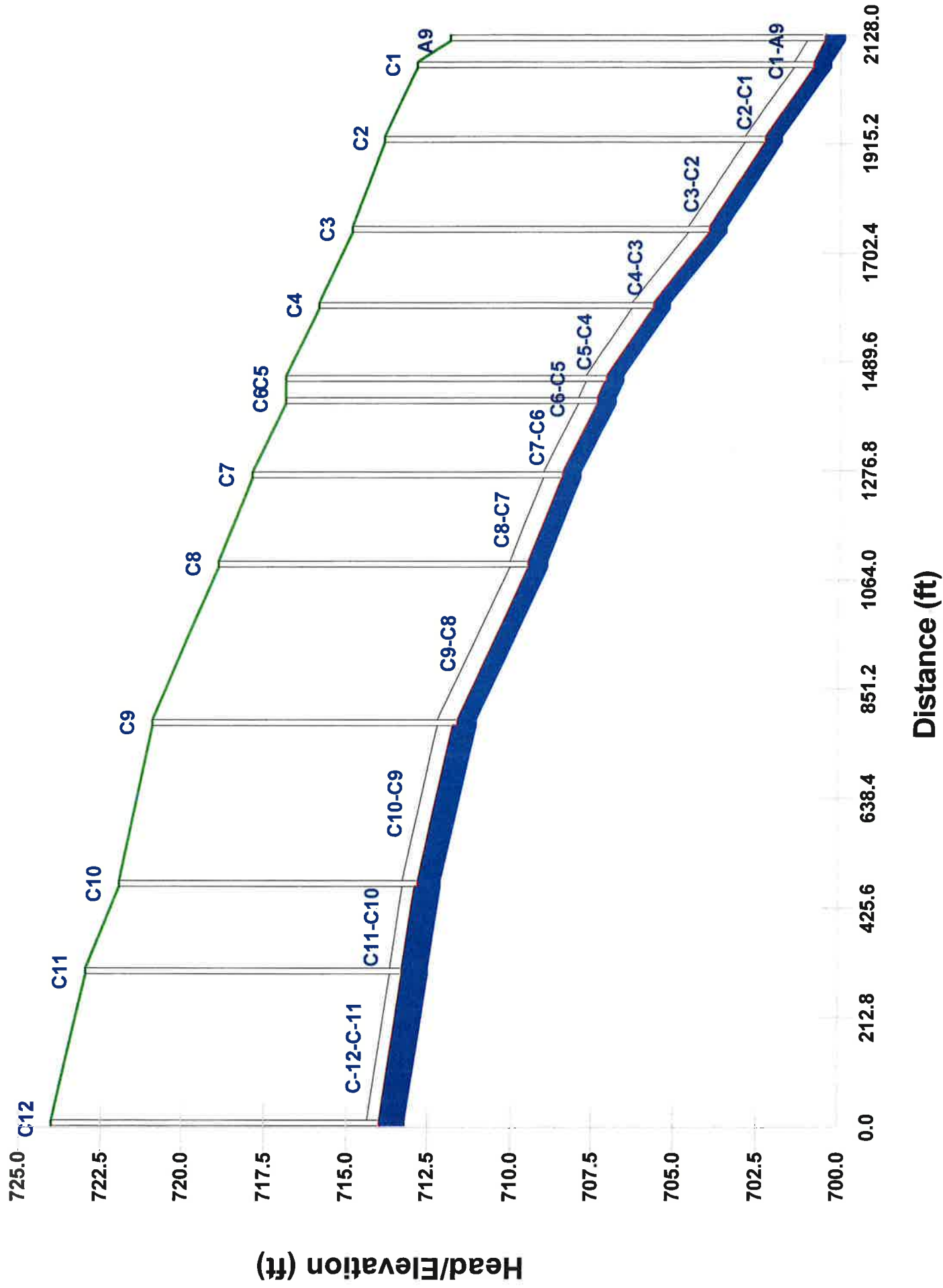
Steady-State HGL Profile of Links A9-A2,A2-A1,,,,,WWTP1-WWTP2

Ground Level / Link / Node / Depth / Head



Steady-State HGL Profile of Lias C-12-C-11, C11-C10, ..., C1-C0

Ground Level / Link / Node / Depth / Head



APPENDIX D

SEWER MODEL BASEMAP

APPENDIX E

SEWER USE REGULATIONS

Chapter 14.06

SEWER USE REGULATIONS

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- 14.06.020 Administration.**
- 14.06.030 Definitions.**
- 14.06.040 Abbreviations.**

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- 14.06.050 Unsanitary deposit unlawful.**
- 14.06.060 Discharge to natural outlet unlawful.**
- 14.06.070 Private systems prohibited.**
- 14.06.080 Standards.**
- 14.06.090 Connection to public sewer when available.**

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- 14.06.150 Permit – Classes – Fee.**
- 14.06.160 Cost liability.**
- 14.06.170 Separate connection to each building.**
- 14.06.190 Construction standards.**
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- 14.06.210 Surface runoff or ground water connection prohibited.**
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- 14.06.300 Special agreements.**
- 14.06.310 Dilution.**
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14.06.520 Confidential information.**Article X. Administrative Enforcement Remedies****14.06.530 State responsibility for administrative actions.****14.06.540 Notification of violation.****14.06.550 Consent orders.****14.06.560 Compliance orders.****14.06.570 Administrative hearing.****14.06.580 Cease and desist orders.****14.06.590 Emergency suspension of wastewater services.****14.06.600 Termination of treatment services (nonemergency).****Article XI. Judicial Enforcement Remedies****14.06.610 Injunctive relief.****14.06.620 Civil penalties.****14.06.630 Remedies nonexclusive.****Article XII. Affirmative Defenses to Discharge Violations****14.06.640 General prohibited discharge standards.****14.06.650 Upset.****14.06.660 Bypass.****Article XIII. Charges and Fees****14.06.670 Purpose.****Article XIV. Miscellaneous Provisions****14.06.680 Severability.****14.06.690 Regulatory conflicts.****Article I. General Provisions****14.06.010 Purpose and policy.**

This chapter sets forth uniform requirements for users of the publicly owned treatment works (POTW) for the city of Buckley (city), and enables the city to comply with all applicable state

and federal laws, including the Clean Water Act ([33 U.S.C. 1251](#) et seq.) and the General Pretreatment Regulations ([40 CFR Part 403](#)). The objectives of this chapter are:

- (1) To prevent the introduction of pollutants into the POTW that will interfere with the operation of the POTW;
- (2) To prevent the introduction of pollutants into the POTW which will pass through the POTW, inadequately treated, into receiving waters or otherwise be incompatible with the POTW;
- (3) To ensure that the quality of POTW sludge is maintained at a level which allows its use and disposal in compliance with applicable statutes and regulations;
- (4) To protect POTW personnel who may be affected by wastewater and sludge in the course of their employment and to protect the general public;
- (5) To improve the opportunity to recycle and reclaim wastewater and sludge (biosolids) from the POTW; and
- (6) To promote strategies to reduce the amounts of pollution generated by users, thereby reducing the associated hazards to the POTW and receiving waters.

This chapter shall apply to all users of the POTW. This chapter defines certain prohibited discharges; sets forth local limits for use by the state agencies in the issuance of wastewater discharge permits; authorizes monitoring, compliance, and enforcement activities; establishes administrative review procedures; requires user reporting; and provides for the setting of fees for the equitable distribution of costs resulting from the program established herein. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.020 Administration.

Except as otherwise provided herein, the city administrator shall administer, implement, and enforce the provisions of this chapter. Any powers granted to or duties imposed upon the city administrator may be delegated by the city administrator to the superintendent or other city of Buckley personnel. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.030 Definitions.

Unless a provision explicitly states otherwise, the following terms and phrases, as used in this chapter, shall have the meanings hereinafter designated. The use of the singular shall be

construed to include the plural and the plural shall include the singular as indicated by the context of its use.

(1) "Accessible," when applied to required pretreatment monitoring or treatment equipment, shall mean direct access without the necessity of removing any panel, door, vehicle, equipment, materials, or other similar obstruction.

(2) "Act" or "the Act" means the federal Water Pollution Control Act, also known as the Clean Water Act ([33](#) U.S.C. [1251](#) et seq.), as amended.

(3) "AKART" is an acronym for "all known, available, and reasonable methods of prevention, control, and treatment." AKART shall represent the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge. AKART shall be applied by all industrial and commercial users of the POTW. Best management practices are a subset of the AKART requirement.

(4) "Administrator" means the city of Buckley city administrator.

(5) "Applicable pretreatment standards" means, for any specified pollutant, Buckley prohibited discharge standards, Buckley local limits, Washington State pretreatment standards, or EPA categorical pretreatment standards, whichever standard is appropriate and most stringent.

(6) "Approval authority" means Washington State Department of Ecology or "Ecology."

(7) "Authorized representative of the user" means:

(a) If the user is a corporation:

(i) The president, secretary, treasurer, or a vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation who has signing authority granted by corporate bylaws; or

(ii) The manager of one or more manufacturing, production, or operation facilities employing more than 250 persons having gross annual sales or expenditures exceeding \$25,000,000 (in second-quarter 2000 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with

corporate procedures;

(b) If the user is a partnership or sole proprietorship: a general partner or proprietor, respectively, if partner has the right of signature or limited power of attorney;

(c) If the user is a federal, state, or local governmental facility: a director or highest official appointed or designated to oversee the operation and performance of the activities of the government facility, or his/her designee.

(d) The individuals described in subsections (7)(a) through (c) of this section may designate another authorized representative if the authorization is in writing, the authorization specifies the individual or position responsible for the overall operation of the facility from which the discharge originates or having overall responsibility for environmental matters for the company, and the written authorization is submitted to the city.

(8) "Best management practices (BMPs)" means schedules of activities, provisions of practices, maintenance procedures, and other management practices to prevent or reduce pollution discharge to the POTW. BMPs also include treatment requirements, operating procedures, and practices to control all discharges to the POTW.

(9) "Biochemical oxygen demand (BOD5)" means the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedures during five days at 20 degrees centigrade, usually expressed as a concentration [milligrams per liter (mg/l)].

(10) "Building drain" means that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building sewer, beginning three feet (one and one-half meters) outside the inner face of the building wall.

(11) "Building sewer" means the extension from the building drain to the public sewer or other place of disposal.

(12) "Bypass" means the intentional diversion of waste streams from any portion of a user's pretreatment facility.

(13) "Categorical pretreatment standard" or "categorical standard" means any regulation

containing pollutant discharge limits promulgated by the U.S. EPA in accordance with Sections 307(b) and (c) of the Act ([33 U.S.C. 1317](#)) which apply to a specific category of users and which appear in [40 CFR](#) Chapter 1, Subchapter N, Parts 405 through 471.

(14) "Categorical user" means a user covered by one or more categorical standards as defined herein.

(15) "Chemical oxygen demand (COD)" means a measure of the oxygen-consuming capacity of inorganic and organic matter present in wastewater. COD is expressed as the amount of oxygen consumed from a chemical oxidant in mg/l during a specific dose.

(16) "City" means the city of Buckley, Washington, a municipal corporation.

(17) "Color" means the optical density at the visual wavelength of maximum absorption, relative to distilled water. One hundred percent transmittance is equivalent to zero optical density.

(18) "Combined sewer" means a sewer receiving both surface runoff and sewage.

(19) "Composite sample" means the sample resulting from the combination of individual wastewater samples taken at selected intervals based on an increment of either flow or time.

(20) "Control authority" means a state entity whose pretreatment program has been approved by the EPA or a municipal entity whose pretreatment program has been approved by the duly authorized state or the EPA.

(21) "Cooling water/noncontact cooling water" means water used for cooling, which does not come into direct contact with any raw material, intermediate product, waste product, or finished product. Cooling water may be generated from any use, such as air conditioning, heat exchangers, cooling or refrigeration to which the only pollutant added is heat.

(22) "County" means Pierce County, Washington, or its authorized deputy, agent, or representative; "Pierce County utilities" includes the director and authorized agents.

(23) "Day" shall be defined as a calendar day.

(24) "Domestic user (residential user)" means any ERU that contributes, causes, or allows the

contribution of wastewater into the POTW that is similar in volume and/or chemical makeup to domestic wastewater.

(25) "Domestic wastewater" means wastewater from residential kitchens, bathrooms, and laundries, and water-borne human wastes from sanitary facilities in all other buildings, together with such ground water infiltration or surface waters as may be present.

(26) "Ecology" means the Washington State Department of Ecology or authorized representatives thereof.

(27) "Environmental Protection Agency (EPA)" means the U.S. Environmental Protection Agency or, where appropriate, the Regional Water Management Division Director, or other duly authorized official of said agency.

(28) "Existing source" means any categorical user which discharges wastewater to the POTW, the construction or operation of which commenced prior to the publication of proposed categorical pretreatment standards which will be applicable to such source if the standard is thereafter promulgated in accordance with Section 307 of the Act.

(29) "Existing user" means any noncategorical industrial user which discharges wastewater to the POTW prior to the effective date of the ordinance codified in this chapter.

(30) "Fats, oils, and grease (FOG)" means those components of wastewater amenable to measurement by the methods described in Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, Section 5520, or latest edition. The term "fats, oils, and grease" shall include polar and nonpolar fats, oils, and grease.

(31) "Food service users" means any user who operates a restaurant, cafe, lunch counter, take-out counter, cafeteria, bar, or club, hotel, hospital, nursing home, retirement village, sanitarium, factory, or school kitchens, or any commercial establishments where grease may be introduced to the sewer system.

(32) "Garbage" means solid wastes from the domestic and commercial preparation, cooking, and dispensing of food, and from the handling, storage, and sale of produce.

(33) "Grab sample" means a sample which is taken from a waste stream on a one-time basis without regard to the flow in the waste stream and without consideration of time.

(34) “Grease interceptor” means an interceptor of at least 750-gallon capacity to serve one or more fixtures and which shall be remotely located. Alternately, a UPC-approved mechanical device for grease removal.

(35) “Grease trap” means a device designed to retain grease from one to a maximum of four fixtures.

(36) “Health Department” means the Tacoma-Pierce County Health Department division of environmental health.

(37) “High strength waste” means any waters or wastewater having a concentration of BOD or total suspended solids in excess of 300 mg/l or having a concentration of fats, oil and grease in excess of 100 mg/l.

(38) “Indirect discharge” or “discharge” means the introduction of pollutants into the POTW from any nondomestic source regulated under Section 307(b), (c), or (d) of the Act. The discharge into the POTW is normally by means of pipes, conduits, pumping stations, force mains, constructed drainage ditches, surface water intercepting ditches, and all constructed devices and appliances appurtenant thereto.

(39) Industrial User. Throughout this chapter, the term “industry” or “industrial user” is meant to apply to any “person” (defined in WAC [173-216-030\(13\)](#)) within the POTW’s service area which has, or may have, a discharge of “industrial wastewater” (as defined in subsection (40) of this section), or who would be subject to categorical standards promulgated by the EPA if they were discharging.

(40) “Industrial wastewater” means water or liquid-carried waste from any industry, manufacturing operation, trade, business, or commercial establishment which includes process wastewater, cooling water, contaminated stormwater, contaminated leachates, or other waters in some combination such that the combined effluent differs in some way from purely domestic wastewater, or is subject to regulation under federal categorical pretreatment standards, the State Waste Discharge Permit Program, or this chapter.

(41) Interceptor. An “interceptor” is a device designed and installed so as to separate and retain deleterious or undesirable matter from normal wastes and permit normal liquid wastes to discharge by gravity.

(42) "Interference" means the effect of a discharge or discharges on the POTW from one or more nondomestic users which results in either:

(a) Inhibition or disruption of the POTW, its treatment processes or operations, or its sludge processes, use, or disposal;

(b) Violation of any permit regulating the POTW's wastewater discharge or sewerage sludge; or

(c) Prevention of sewage sludge use or disposal in compliance with any applicable statutory or regulatory provision or permit issued hereunder. (Applicable sludge regulations shall include Section 405 of the Clean Water Act; the Solid Waste Disposal Act (SWDA), including Title II, commonly referred to as the Resource Conservation and Recovery Act (RCRA); state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA; the Clean Air Act; the Toxic Substances Control Act; the Marine Protection, Research, and Sanctuaries Act; and [40 CFR Part 503](#).)

(43) "Maximum allowable discharge limit" means the maximum concentration of a pollutant allowed to be discharged at any time, determined from the analysis of any discrete or composite sample collected, independent of the industrial flow rate and the duration of the sampling event.

(44) "Medical wastes" means isolation wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, contaminated bedding, surgical wastes, potentially contaminated laboratory wastes, and dialysis wastes.

(45) "Natural outlet" means any outlet into a watercourse, pond, ditch, lake or other body of surface or ground water.

(46) "New source" means:

(a) Any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced after the publication of proposed pretreatment standards under Section 307(c) of the Act which will be applicable to such sources if such standards are thereafter promulgated in accordance with that section; provided, that:

(i) The building, structure, facility, or installation is constructed at a site at which no other source is located; or

(ii) The building, structure, facility, or installation totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or

(iii) The production of wastewater generating processes of the building structure, facility, or installation or substantially independent of an existing source at the same site. In determining whether these are substantially independent, factors such as the extent to which the new facility is integrated with the existing plant, and the extent to which the new facility is engaged in the same general type of activity as the existing source, should be considered.

(b) Construction on a site at which an existing source is located results in a modification rather than a new source if the construction does not create a new building, structure, facility, or installation meeting the criteria of subsections (46)(a)(ii) or (iii) of this section, but otherwise alters, replaces, or adds to existing process or production equipment.

(c) Construction of a new source as defined herein has commenced if the owner or operator has:

(i) Begun, or caused to begin as part of a continuous on-site construction program, any placement, assembly, or installation of facilities or equipment; or significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for placement, assembly, or installation of new source facilities or equipment; or

(ii) Entered into a binding contractual obligation for the purchase of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies, do not constitute a contractual obligation under this subsection.

(47) "New user" means any noncategorical user that plans to discharge a new source of wastewater to the city's sewerage system after the effective date of the ordinance codified in

this chapter. This discharge may be from either a new or an existing facility. Any person that buys an existing facility that is discharging nondomestic wastewater will be considered an “existing user” if no significant changes are made in the manufacturing operation.

(48) “Pass through” means a discharge which exits the POTW in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the city’s NPDES or State Waste Discharge Permit (including an increase in the magnitude or duration of a violation) or causes a violation of any water quality standard for waters of the state promulgated under state regulations, including Chapter [173-201A WAC](#).

(49) “Permittee” means a person or user issued a wastewater discharge permit or discharge authorization.

(50) “Person” means any individual, partnership, firm, company, corporation, association, joint stock company, trust, estate, any federal, state, or local governmental agency or entity, or any other entity whatsoever; or their legal representatives, agents, or assigns.

(51) “pH” means a measure of the acidity or alkalinity of a substance, expressed in standard units.

(52) “Pollutant” means any substance, either liquid, gaseous, solid, or radioactive, discharged to the POTW which, if discharged directly, would alter the chemical, physical, thermal, biological, or radiological properties of waters of the state of Washington including pH, temperature, taste, color, turbidity, oxygen demand, toxicity, or odor. This includes any discharge likely to create a nuisance or render such waters harmful, detrimental, or injurious to any beneficial uses, terrestrial, or aquatic life, or to public health, safety, or welfare.

(53) “Pollution prevention” means source reduction; protection of natural resources by conservation; or increased efficiency in the use of raw materials, energy, water, or other resources.

(54) “Pretreatment” means the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to (or in lieu of) introducing such pollutants into the POTW. This reduction or alteration can be obtained by physical, chemical, or biological processes; by process changes; or by other means (except by

diluting the concentration of the pollutants unless allowed by an applicable pretreatment standard).

(55) "Pretreatment facilities" means any device, structure or method which will remove specified pollutants and/or chemicals from the wastewater prior to its discharge into the POTW.

(56) "Pretreatment program" means an industrial wastewater pretreatment program administered by Ecology or applicable control authority and/or the U.S. EPA under their respective laws and regulations and includes any requirements for local municipalities necessary to assist and support Ecology and/or the EPA's program.

(57) "Pretreatment requirements" means any substantive or procedural state, local, or federal requirement related to pretreatment developed under Chapter [90.48](#) RCW and/or Sections 307 and 402 of the Clean Water Act.

(58) "Pretreatment standards" or "standards" means any pollutant discharge limitations including categorical standards, state standards, and local limits of this chapter applicable to the discharge of nondomestic wastes to a POTW. The term shall also include the prohibited discharge standards of this chapter, WAC [173-240-060](#), and [40](#) CFR Part [403.5](#).

(59) "Process wastewater" means industrial wastewater discharged from one or more commercial or industrial processes or cleanup procedures. Process wastewater does not include domestic waste or noncontact cooling water. Process wastewater may refer to one process discharge or several commingled process discharges.

(60) "Prohibited discharge standards" or "prohibited discharges" means absolute prohibitions against the discharge of certain substances; these prohibitions appear in this chapter.

(61) "Properly shredded garbage" means the wastes from the preparation, cooking, and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half inch (1.27 centimeters) in any dimension.

(62) "Public sewer" means a sewer constructed for conveyance of liquid wastes which is controlled by a public authority.

(63) "Publicly owned treatment works (POTW)" means any "treatment works," as defined by Section 212 of the Act ([33 U.S.C. 1292](#)) which is owned by the city, county, or state. This definition includes any devices or systems used in the collection, storage, treatment, recycling, and reclamation of sewage or industrial wastes of a liquid nature and any conveyances which convey wastewater to the treatment plant.

(64) "Recreational vehicle waste (RV waste)" means any domestic and/or residential wastes from holding tanks on private recreational vehicles, including travel trailer, pickup truck-mounted campers, and mobile domestic single-family recreational vehicles. This category does not include tour buses and public transportation vehicles. This category does not include wastes from vehicles which collect wastewater from holding tanks.

(65) "Sanitary sewer" means a sewer which carries sewage and to which storm, surface, and ground waters are not intentionally admitted.

(66) "Self-monitoring report" means a report, submitted to the city, Ecology, or applicable control authority by the user, containing sampling test results on wastewater discharges' quality and quantity. Results shall be from a certified lab as required by Chapter [173-216 WAC](#).

(67) "Septic tank waste" or "septage" means any sewage and sludge from individual wastewater disposal systems such as septic tanks and cesspools; and domestic wastes from holding tanks and chemical toilets.

(68) "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 which 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.

(69) "Sewage" or "wastewater" means water-carried human wastes or a combination of water-carried wastes from residences, business buildings, institutions and industrial establishments, together with such ground, surface, storm, or other waters or wastes as may be present.

(70) "Sewage treatment plant" means any arrangement of devices and structures used for treating sewage.

(71) "Sewer" means any pipe, conduit ditch, or other device used to collect and transport sewage from the generating source to the POTW.

(72) "Shall" is mandatory; "may" is permissive.

(73) "Significant industrial user (SIU)" means:

(a) A user subject to categorical pretreatment standards; or

(b) A user that:

(i) Discharges an average of 25,000 gpd or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater); or

(ii) Contributes a process waste stream which makes up five percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or

(iii) Is designated as such by Ecology with input from the city on the basis that it, alone or in conjunction with other sources, has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.

(c) Upon finding that a user meeting the criteria in subsection (73)(b) of this section has no reasonable potential for adversely affecting the POTW's operation or for violating any applicable pretreatment standard or requirement, Ecology may at any time, on its own initiative or in response to a petition from a user or the city and in accordance with procedures in [40 CFR 403.8\(f\)\(6\)](#), determine that such user should not be considered a significant industrial user.

(74) "Significant noncompliance (SNC)" shall refer to a violation or pattern of violations of one of the following natures:

(a) Chronic violations of wastewater discharge limits, defined here as those in which 66 percent or more of all wastewater measurements taken during a six-month period exceed the daily maximum limit or average limit for the same pollutant parameter by any amount;

(b) Technical review criteria (TRC) violations, defined here as those in which 33 percent

or more of all wastewater measurements taken for each pollutant parameter during a six-month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable TRC (1.4 for BOD, TSS, fats, oils and grease, and 1.2 for all other pollutants except pH);

(c) Any other discharge violation that the city believes has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of city personnel or the general public);

(d) Any discharge of pollutants that has caused imminent endangerment to human health, welfare, or to the environment, or has resulted in the city's exercise of its emergency authority to halt or prevent such a discharge;

(e) Failure to meet, within 90 days after the scheduled date, a compliance schedule milestone contained in a wastewater discharge permit or enforcement order for starting construction, completing construction, or attaining final compliance;

(f) Failure to provide, within 30 days after the due date, any required reports, including baseline monitoring reports, periodic self-monitoring reports, and reports on compliance with compliance schedules;

(g) Failure to accurately report noncompliance; or

(h) Any other violation(s) which the city determines will adversely affect the operation or implementation of the pretreatment program.

(75) "Slug load" means any discharge at a flow rate or concentration which could cause a violation of the discharge standards of this chapter or any discharge of a nonroutine, episodic nature, including, but not limited to, an accidental spill or a noncustomary batch discharge.

(76) "Standard Industrial Classification (SIC) Code" means a classification pursuant to the Standard Industrial Classification Manual issued by the United States Office of Management and Budget.

(77) "State" means the state of Washington.

(78) "Storm drain" (sometimes termed "storm sewer") means a sewer which carries storm and

surface waters and drainage, but excludes sewage and industrial wastes, other than unpolluted cooling water.

(79) “Stormwater” means any flow occurring during or following any form of natural precipitation, and resulting from such precipitation, including snowmelt.

(80) “Superintendent” means the superintendent of sewage works and/or of water pollution control of the city, or his authorized deputy, agent or representative.

(81) “Total suspended solids (TSS)” means the total suspended matter that floats on the surface of, or is suspended in, water, wastewater, or other liquid, and which is removable by laboratory filtering.

(82) “Toxic pollutant” means:

(a) Any pollutant or combination of pollutants listed as toxic in the regulations promulgated by the EPA pursuant to authority under the Clean Water Act (“CWA” [33](#) U.S.C. Section [1251](#) et seq.), the Resource Conservation and Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA” [42](#) U.S.C. Section [9601](#) et seq.); or

(b) Any dangerous waste or extremely dangerous waste or mixed waste as listed in the regulations promulgated by the Washington State Department of Ecology pursuant to the Hazardous Waste Management Act (Chapter [70.105](#) RCW et seq.).

(83) “Treatment plant effluent” means the discharge from the POTW.

(84) Uniform Plumbing Code. The “Uniform Plumbing Code (UPC)” stated shall be the Uniform Plumbing Code as adopted by the county and in effect at the time of construction.

(85) “Upset” means an exceptional incident causing unintentional and temporary noncompliance with applicable pretreatment standards due to factors beyond the reasonable control of the user. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(86) “User” or “commercial and/or industrial user” means a source of wastewater discharge to

the POTW exclusive of domestic users as defined herein.

(87) Wastewater. See “sewage.”

(88) “Wastewater discharge permit (industrial wastewater discharge permit, discharge permit)” means an authorization or equivalent control document issued by Ecology to users discharging wastewater to the POTW. The permit may contain appropriate pretreatment standards and requirements as set forth in this chapter.

(89) “Wastewater treatment plant” or “treatment plant” means that portion of the POTW designed to provide treatment of sewage as defined herein.

(90) “Watercourse” means a channel in which a flow of water occurs, either continuously or intermittently.

(91) “Zero discharge permit” means a permit for a categorical user that operates its processes so that no industrial wastewater is discharged to the POTW. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 1, 1981. Formerly 14.06.010).

14.06.040 Abbreviations.

ASPP – Accidental spill prevention plan.

AKART – All known, available, and reasonable means of prevention, control and treatment (see BMC [14.06.030](#), Definitions).

BOD – Biochemical oxygen demand.

CFR – Code of Federal Regulations.

CWA – Clean Water Act.

COD – Chemical oxygen demand.

EPA – U.S. Environmental Protection Agency.

ERU – Equivalent residential unit.

FIFRA – Federal Insecticide Fungicide and Rodenticide Act.

FOG – Fats, oils and grease.

gpd – Gallons per day.

L – Liter.

LEL – Lower explosive limit.

Mg – Milligrams.

Mg/l – Milligrams per liter.

NPDES – National Pollutant Discharge Elimination System as defined under Section 402 of the Clean Water Act.

O&M – Operation and maintenance.

POTW – Publicly owned treatment works.

RCRA – Resource Conservation and Recovery Act.

SIC – Standard Industrial Classifications.

SWDA – Solid Waste Disposal Act ([42](#) U.S.C. [6901](#), et seq.).

TSS – Total suspended solids.

UPC – Uniform Plumbing Code.

U.S.C. – United States Code.

WAC – Washington Administrative Code. (Ord. 04-10 § 1 (Exh. A), 2010).

Article II. Use of Public Sewers Required

14.06.050 Unsanitary deposit unlawful.

It is unlawful for any person to place, deposit, or permit to be deposited in any unsanitary manner on public or private property within the city, or in any area under the jurisdiction of the city, any human or animal excrement, garbage, or other objectionable waste. (Ord. 04-10 § 1

(Exh. A), 2010; Ord. 1015 Art. 2 § 1, 1981. Formerly 14.06.020).

14.06.060 Discharge to natural outlet unlawful.

It is unlawful to discharge to any natural outlet within the city, or in any area under the jurisdiction of the city, any sewage or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this chapter. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 2 § 2, 1981. Formerly 14.06.030).

14.06.070 Private systems prohibited.

Except as hereinafter provided, it is unlawful to construct or maintain any privy, privy vault, septic tank, cesspool, or other facility intended or used for the disposal of sewage. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 2 § 3, 1981. Formerly 14.06.040).

14.06.080 Standards.

Anyone desiring to install an on-site septic system(s) on real property(ies) within the city of Buckley shall be required to make application to and receive approval from the Pierce County Health Department prior to installation of such system. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 03-04 § 1, 2004. Formerly 14.06.090).

14.06.090 Connection to public sewer when available.

Public sewer shall be deemed available when capacity exists to serve the property and when a main line is within 200 feet of the property line. Property owners installing septic systems after July 1, 2000, shall connect to the public sewer when available and the septic system shall be abandoned in accordance with the requirements of the Pierce County Health Department. Connection shall occur within two years of notice from the city of availability. The cost of such connection and abandonment shall be borne by the property owner in accordance with Chapter [14.08](#) BMC. Property owners with pre-existing septic systems shall connect to the public sewer subject to the conditions in Chapter [14.08](#) BMC. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 03-04 § 2, 2004. Formerly 14.06.100).

Article III. Building Sewers and Connections

14.06.140 Permit – Required.

No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenances thereof without first obtaining a written permit from the superintendent. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 1, 1981).

14.06.150 Permit – Classes – Fee.

There shall be two classes of building sewer permits: (1) for residential and commercial service, and (2) for service to establishments producing industrial wastes. In either case, the owner or his agent shall make application on a special form furnished by the city. The permit application shall be supplemented by any plans, specifications, or other information considered pertinent in the judgment of the superintendent. A permit and inspection fee shall be established by resolution of the city council and shall be paid to the city at the time the application is filed. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 13-08 § 13, 2008; Ord. 1015 Art. 4 § 2, 1981).

14.06.160 Cost liability.

All costs and expense incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the city from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 3, 1981).

14.06.170 Separate connection to each building.

A separate and independent building sewer shall be provided for every building; except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one building sewer. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 4, 1981).

14.06.190 Construction standards.

The size, slope, alignment, materials of construction of a building sewer, and the methods to be used in excavating, placing of the pipe, jointing, testing, and backfilling the trench shall all conform to the requirements of the building and plumbing code or other applicable rules and regulations of the city. In the absence of code provisions or in amplification thereof, the materials and procedures set forth in appropriate specifications of the A.S.T.M. and W.P.C.F. Manual of Practice No. 9 shall apply. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 6, 1981).

14.06.200 Elevation of connection.

Whenever possible, the building sewer shall be brought to the building at an elevation below the basement floor. In all buildings in which any drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved

means and discharged to the building sewer. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 7, 1981).

14.06.210 Surface runoff or ground water connection prohibited.

No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or ground water to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 8, 1981).

14.06.220 Connection standards.

The connection of the building sewer into the public sewer shall conform to the requirements of the building and plumbing code or other applicable rules and regulations of the city, or the procedures set forth in appropriate specifications of the A.S.T.M. and the W.P.C.F. Manual of Practice No. 9. All such connections shall be made gastight and watertight. Any deviation from the prescribed procedures and materials must be approved by the superintendent before installation. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 9, 1981).

14.06.230 Inspection and supervision.

The applicant for the building sewer permit shall notify the superintendent when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the superintendent or his representative. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 10, 1981).

14.06.240 Excavation protection and restoration.

All excavations for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways, and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the city. (Ord. 04-10 § 1 (Exh. A), 2010; Ord. 1015 Art. 4 § 11, 1981).

Article IV. Use of Public Sewers

14.06.250 Prohibited discharge standards.

(1) General Prohibitions. No user shall introduce or cause to be introduced into the POTW any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the POTW whether or not they are subject to categorical pretreatment standards or any other federal, state, or local pretreatment standards or requirements ([40](#) CFR

[403.5\(a\)](#) and WAC [173-216-060\(2\)\(b\)\(i\)](#)).

(2) Specific Prohibitions. No user shall introduce or cause to be introduced into the POTW the following pollutants, substances or gases, either singly or combined in a waste stream:

(a) Any pollutant which either alone or by interaction may create a fire or explosive hazard in the POTW, including, but not limited to, waste streams with a closed-cup flashpoint of less than 140 degrees Fahrenheit (60 degrees centigrade) using the test methods specified in [40 CFR 261.21](#) ([40 CFR 403.5\(b\)\(1\)](#)), or are capable of creating a public nuisance (WAC [173-216-060\(2\)\(b\)\(ii\)](#));

(b) Any pollutant which will cause corrosive structural damage to the POTW, but in no case discharges with a pH less than 5.5 or more than 10, or having any other corrosive property capable of causing damage or hazard to structures, equipment, or personnel of the system, unless the system is specifically designed to accommodate such discharge and the discharge is authorized by a permit under the State Waste Discharge Permit Program ([40 CFR 403.5\(b\)\(2\)](#) and WAC [173-216-060\(2\)\(b\)\(iv\)](#));

(c) Any solid or viscous substances including fats, oils, and grease in amounts which may cause obstruction to the flow in a POTW or other interference with the operation of the POTW ([40 CFR 403.5\(b\)\(3\)](#) and WAC [173-216-060\(2\)\(b\)\(iii\)](#));

(d) Any discharge of pollutants, including oxygen-demanding pollutants (BOD, etc.), released at a flow rate and/or pollutant concentration which, either singly or by interaction with other pollutants, is sufficient to cause interference with the POTW ([40 CFR 403.5\(b\)\(4\)](#) and WAC [173-216-060\(2\)\(b\)\(vi\)](#));

(e) Any waste stream having a temperature which will inhibit biological activity in the treatment plant resulting in interference, or cause worker health or safety problems in the collection system. In no case shall wastewater be discharged at a temperature which causes the temperature at the introduction to the POTW treatment plant to exceed 104 degrees Fahrenheit (40 degrees centigrade) unless the system is specifically designed to accommodate such a discharge, and the discharge is authorized under the State Waste Discharge Permit Program ([40 CFR 403.5\(b\)\(5\)](#) and WAC [173-216-060\(2\)\(b\)\(v\)](#));

(f) Any petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in

amounts that will cause interference or pass through ([40 CFR 403.5\(b\)\(6\)](#) and WAC [173-216-060\(2\)\(b\)\(i\)](#));

(g) Any pollutants which result in the presence of toxic gases, vapors, or fumes within any portion of the POTW in a quantity that may cause acute worker health and safety problems ([40 CFR 403.5\(b\)\(7\)](#));

(h) Any trucked or hauled wastes, except at discharge points designated by the city and in compliance with all applicable city requirements and during specified hours ([40 CFR 403.5\(b\)\(8\)](#));

(i) Any noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair (WAC [173-216-060\(2\)\(b\)\(ii\)](#));

(j) Any of the following discharges unless approved by the city under extraordinary circumstances, such as the lack of direct discharge alternatives due to a combined sewer service or need to augment sewage flows due to septic conditions (WAC [173-216-060\(2\)\(b\)\(vii\)](#)):

(i) Noncontact cooling water in significant volume;

(ii) Stormwater, and other direct inflow sources;

(iii) Wastewater significantly affecting system hydraulic loading, which does not require treatment or would not be afforded a significant degree of treatment by the system;

(iv) Stormwater, surface water, ground water, artesian well water, roof runoff, subsurface drainage, deionized water, and unpolluted wastewater;

(k) Any dangerous or hazardous wastes as defined in Chapter [173-303](#) WAC, as amended, except as allowed in compliance with that regulation (WAC [173-216-060\(1\)](#) and [40 CFR Part 261](#));

(l) Any substance which will cause the POTW to violate its NPDES or other disposal

system permits or causing, alone or in conjunction with other sources, the treatment plant's effluent to fail a toxicity test;

(m) Any substance which may cause the POTW's effluent or treatment residues, sludge, or scum to be unsuitable for reclamation and reuse, or would interfere with the reclamation process or cause the POTW to be in noncompliance with sludge use or disposal criteria, guidelines or regulations developed pursuant to the federal, state, or local statutes or regulations applicable to the sludge management method being used;

(n) Any liquids, solids, or gases which either singly, in conjunction, or by interaction with other waste streams cause two successive readings on an explosion meter to be more than five percent or any single reading over 10 percent of the lower explosive limit (LEL) of the meter at any point in the collection system or treatment works;

(o) Anything which imparts color which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions, which consequently imparts color to the treatment plant's effluent, thereby violating the city's NPDES permit. Color (in combination with turbidity) shall not cause the treatment plant effluent to reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonably established norm for aquatic life;

(p) Any discharge containing radioactive wastes or isotopes except as specifically approved by the city in compliance with applicable state or federal regulations including WAC [246-221-190](#), "Disposal by Release into Sanitary Sewerage System"; and meeting the concentration limits of WAC [246-221-290](#) Appendix A, Table 1, Column 2, and WAC [246-221-300](#) Appendix B, and not violating any other prohibition;

(q) Any sludge, screenings, or other residues from the pretreatment of industrial wastes or from industrial processes;

(r) Any medical wastes or infectious wastes, except as specifically authorized by the city;

(s) Any detergents, surface-active agents, or other substances in amounts which may cause excessive foaming in the POTW;

(t) Any incompatible substance such as: grease, animal guts or tissues, paunch manure, bones, hair, hides or fleshing, entrails, whole blood, feathers, ashes, cinders, sand, spent

lime, stone or marble dusts, metal, glass, straw, shavings, grass clippings, rags, spent grains, spent hops, waste paper, wood, plastics, gas, tar asphalt residues, residues from refining or processing of fuel or lubricating oil, mud, or glass grinding or polishing wastes, or any other organic or inorganic matter greater than one-half inch in any dimension;

(u) Any garbage that has not been properly shredded. The installation and operation of any garbage grinder equipped with a motor of three-fourths horsepower (0.76 hp metric) or greater shall be subject to the review and approval of the superintendent;

(v) Persistent pesticides and/or pesticides regulated by the Federal Insecticide Fungicide and Rodenticide Act (FIFRA);

(w) Any waters or wastes containing iron, chromium, pickling wastes, or concentrated plating solutions, whether neutralized or not;

(x) Any wastewater which in the opinion of the city can cause harm either to the sewers, sewage treatment process, or equipment; have an adverse effect on the receiving stream; or can otherwise endanger life, limb, public property, or constitute a nuisance, unless allowed under special agreement by the city (except that no waiver shall be given from categorical pretreatment standards);

(y) Any wastewater having a total fat waste, oil, or grease (whether or not emulsified), hexane or ether-soluble matter content in excess of 100 mg/l; or any substance which may solidify or become discernibly viscous at temperatures above zero degrees centigrade (32 degrees Fahrenheit);

(z) Any wastewater having an average BOD5 concentration more than 300 mg/l;

(aa) Any wastewater having an average TSS concentration more than 300 mg/l;

(bb) The contents of any tank or other vessel owned or used by any person in the business of collecting or pumping sewage, effluent, septage, or other wastewater unless said person has first obtained testing and approval as may be generally required by the city and paid all assessed fees for testing and discharge;

(cc) Any slug load, which shall mean any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a single extraordinary discharge episode of such

volume or strength as to cause interference to the POTW;

(dd) Any substance which may cause the POTW's effluent or treatment residues, sludges, or scums to be unsuitable for reclamation and reuse, or interface with the reclamation process.

(3) Pollutants, substances, or wastewater prohibited by this section shall not be processed or stored in such a manner that they could be discharged to the POTW. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.260 Federal categorical pretreatment standards.

National categorical pretreatment standards as adopted and hereafter amended by the EPA pursuant to the Act shall be met by all industrial users of the regulated industrial categories. These standards, found in [40](#) CFR Chapter 1, Subchapter N, Parts 405 through 471, are hereby incorporated by reference. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.270 State requirements.

(1) State requirements and limitations on discharges to the POTW, as incorporated into Washington State law by Chapter [90.48](#) RCW and implemented in Chapters [173-201A](#), [173-216](#), and [173-270](#) WAC, shall be met by all users who are subject to such standards in any instance in which they are more stringent than federal requirements and limitations or those in this chapter.

(2) Any user determined by the city to qualify as a significant industrial user (SIU) shall file an application for a State Waste Discharge Permit with Ecology in accordance with the requirements of WAC [173-216-070](#). Proof of acceptance of the application and payment of permit fees shall be kept at the user's facilities, and produced upon request by the city. Failure to submit the application or rejection of the application by Ecology is sufficient grounds to terminate or refuse to provide sewer service. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.280 Local limits.

(1) The city shall have the authority to establish effluent limitations and/or require compliance with applicable effluent limitations or other pretreatment requirements. The city shall also have the authority to enforce the following limitations on wastewater strength, and any subsequent limitations adopted pursuant to this chapter.

(2) No person shall discharge process wastewater containing concentrations in excess of the established daily maximum allowable discharge limits unless prior written approval has been obtained from the city. These limits shall apply at the point where the wastewater is discharged to the POTW (end of the pipe). All concentrations for metallic substances are for “total” metal unless indicated otherwise. The city or applicable control authority may impose mass limitations in addition to or in place of concentration-based limitations. Where a user is subject to a categorical pretreatment standard and a local limit for a given pollutant, the more stringent limit or applicable pretreatment shall apply. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.290 City’s right of revision.

The city reserves the right to establish more stringent standards or requirements on discharges to the POTW. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.300 Special agreements.

(1) The city reserves the right to enter into special agreements with users setting out special terms under which they may discharge to the POTW. In no case will a special agreement waive compliance with a categorical pretreatment standard or federal pretreatment requirement. However, the user may request a net gross adjustment to a categorical standard in accordance with [40 CFR 403.15](#). They may also request a variance from the categorical pretreatment standard from the approval authority in accordance with [40 CFR 403.13](#).

(2) The city may enter into agreements with users to accept pollutants compatible with the treatment system at greater than domestic strengths. Within such agreements, the city may establish terms of the user’s discharge to the POTW including, but not limited to, maximum flow rates and concentrations. The city may also establish fees to recover costs associated with treating such wastes and monitoring schedules in such agreements. In no case will a special agreement waive compliance with a state or federal pretreatment standard or requirement including categorical standards.

(3) Users discharging or intending to discharge pollutants other than BOD and TSS, and claiming compatibility, must prove to the satisfaction of the city that such pollutants are compatible with the POTW. The city may require any claim of compatibility to be endorsed by Ecology.

(4) The city may assist, by arrangement or formal agreement, agencies that regulate hazardous wastes and materials, and air emissions from users in order to maximize state,

county, and city resources.

(5) The city specifically may arrange to act as an agent of Ecology to determine compliance with treatment or disposal requirements and inspect on-site disposal activities and shipping documents. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.310 Dilution.

No user shall ever increase the use of process water, or in any way attempt to dilute a discharge, as a partial or complete substitute for adequate treatment to achieve compliance with an applicable pretreatment standard or requirement unless expressly authorized by an applicable pretreatment standard or requirement. The city may impose mass limitations on users who they believe may be using dilution to meet applicable pretreatment standards or requirements, or in other cases when the imposition of mass limitations is appropriate. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.320 Pretreatment facilities.

(1) Review and Acceptance of Pretreatment Facilities. Users shall provide necessary wastewater treatment as required to comply with this chapter and shall achieve compliance with all applicable pretreatment standards and requirements set forth in this chapter within the time limitations specified by the EPA, the state, or the city, whichever is more stringent. Users shall procure, install, operate, and maintain the wastewater facilities which, combined with appropriate practices, are necessary to achieve AKART as defined herein. Any facilities required to pretreat wastewater to a level acceptable to the city shall be provided, operated, and maintained at the user's expense. Detailed plans showing the pretreatment facilities and operating procedures shall be submitted to Ecology for review and approval in accordance with the procedures of Chapter [173-240](#) WAC, and shall be disclosed to the city before construction of the facility. Proof of Ecology approval should be disclosed to the city upon request. The review of such plans and operating procedures will in no way relieve the user from the responsibility of modifying the facility as necessary to produce an acceptable discharge to the city under the provisions of this chapter. The user will obtain all necessary construction/operating permits from the city, county, or Ecology. Prior to completion of the wastewater pretreatment facility, the user shall furnish its plan of operations and maintenance procedures to Ecology to review. Such pretreatment facilities shall be under the control and direction of a person qualified to operate such facilities.

(2) Standards of Pretreatment. Users shall provide all known, available, and reasonable

methods of prevention, control, and pretreatment including best management practices to comply with this chapter and state and federal regulations.

(3) New Construction. Any subsequent proposal for significant changes in pretreatment facilities or method of operation shall be reported to and be reviewed and accepted by the applicable control authority prior to the user's initiation of such changes. Proof of approval by the applicable control authority shall be disclosed to the city upon request. Any necessary construction permits shall be obtained before new construction or modification of an existing facility. If applicable, the user shall obtain a discharge permit. The review of such plans shall in no way relieve the user from the responsibility of modifying its facility as necessary to produce an effluent acceptable to the city or applicable control authority under the provisions of this chapter.

(4) Submission of Plans and Reports. Pretreatment facilities shall comply with the applicable requirements of Chapter [173-240 WAC](#), WAC [173-216-050\(3\)](#), and RCW [90.48.010](#). Users shall comply with approved engineering reports, plans and specifications, and operation and maintenance manuals, and shall modify such documents to reflect any proposed modifications of pretreatment facilities. Users shall submit proposals to modify pretreatment facilities to Ecology before implementation in accordance with Chapter [173-240 WAC](#). Users shall submit a copy of Ecology's acceptance to the city before implementing changes to approved pretreatment facilities. Any subsequent proposal for significant changes in the pretreatment facilities or method of operation shall be reported to and be accepted by the city and/or applicable control authority prior to the user's initiation of the changes. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.330 Pretreatment facilities for fats, oils, and grease (FOG).

(1) General.

(a) All persons are prohibited from discharging, or causing to be discharged, processing wastewater to the collection system or POTW which contains oils, greases, solids, or liquids sufficient to cause obstruction or otherwise interfere with the proper operations of the POTW or collection system.

(b) All persons are prohibited from disposing any grease waste or processing waste containing oils, greases, solids, or liquids and discharge said waste into any drainage piping, public or private sanitary sewer, storm drainage system, sufficient to interfere with

the proper operation of that system, or to discharge said waste to any land, street, public way, river, stream, or other waterway.

(c) All persons are prohibited from accumulating liquid waste on his property or in his possession which is injurious to public health or emits offensive odors.

(d) All persons are prohibited from utilizing any chemical emulsifying agent for the purpose of hindering or eliminating the interception of fats or grease prior to entering the city's wastewater collection system.

(e) Food service establishments and other facilities described in subsection (4) of this section discharging wastewater shall install, operate, clean, and maintain a sufficiently sized oil and grease, water and solids separator (herein called grease interceptor), and/or a UPC mechanical device necessary to achieve compliance with requirements set forth under this provision. No grease interceptor shall be less than 750 gallons capacity. Grease traps shall be sized according to pounds of grease retained and be compatible with UPC standards.

(f) Oil or grease of petroleum or mineral origin shall not be discharged to the city's sewer system at a concentration in excess of 100 mg/l.

(g) Fats, oil, or grease of animal or vegetable origin shall not be discharged to the city's sewer system at a concentration in excess of 100 mg/l.

(h) The concentration of oils and grease shall be measured in samples taken from the sampling chamber following pretreatment in an approved grease interceptor or UPC-approved mechanical device in accordance with the requirements of this section. Oil and grease concentration shall be measured using the partition-gravimetric method or the partition-infrared method outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, published by the American Public Health Association.

(2) Waste Discharge Requirements.

(a) Waste discharge from fixtures and equipment in establishments that may contain grease, including but not limited to scullery sinks, pot and pan sinks, vent hood drains, dishwashing machines, soup kettles and floor drains located in areas where grease-

containing materials may exist, may be drained into the sanitary sewer only after such discharges are pretreated in an approved grease waste interceptor and/or UPC-approved mechanical device in accordance with this section.

(b) No sanitary wastes from toilets, urinals, or other similar fixtures may be discharged through any grease waste interceptor and/or UPC-approved mechanical device. All wastes shall enter the interceptor through the inlet pipe only. The use of garbage grinders/shredders into any fixture which discharges to a grease waste interceptor is prohibited.

(3) Location.

(a) Each grease interceptor shall be so installed and connected that it shall be at all times easily accessible for inspection, cleaning, and the removal of the intercepted grease. Location of the interceptor shall meet the approval of the city, per UPC and/or Pierce County Health Code.

(b) Interceptors shall be placed as close as practical to the fixture(s) they serve.

(c) Each business establishment for which a grease interceptor and/or UPC-approved mechanical device is required shall have an interceptor or device which shall serve only that establishment unless otherwise approved by the city.

(4) Pretreatment Required.

(a) Dischargers who operate newly constructed or remodeled restaurants, meat cutting facilities, cafes, lunch counters, bakeries, cafeterias, bars, or clubs; or hotel, hospital, sanitarium, factory or school kitchens; or other establishments that serve or prepare food where grease may be introduced to the sewer system shall have pretreatment facilities to prevent the discharge of fat waste, oil, or grease.

(b) Dischargers who operate automatic and coin-operated laundries, car washes, filling stations, commercial garages, or similar businesses having any type of washing facilities (including pressure washing and steam cleaning) or any other dischargers producing grit, sand, oils, lint, or other materials which have the potential of causing partial or complete obstruction of the building site sewer or other areas in the POTW shall install and maintain approved interceptors, oil/water separators, or tanks such that excessive

amounts of oil, sand, and inert solids are effectively prevented from entering the POTW.

(5) Design.

(a) Grease interceptors shall be multiple compartment flotation chambers where grease floats to the water surface and is retained while the clear water underneath is discharged. The clear water discharged is subject to the discharge prohibitions of subsections (1)(f) and (g) of this section.

(b) The grease interceptor shall be followed by a sampling compartment to allow for monitoring of discharges from the pretreatment unit. The geometry of the sampling compartment shall be in accordance with the city standard plan for grease interceptors available at the city's office. Interceptors shall have fittings designed for grease retention.

(c) There shall be an adequate number of manholes to provide access for cleaning and maintenance of all areas of the interceptors and oil/water separators.

(6) Sizing Criteria.

(a) New grease interceptors, grease traps, and mechanical grease removal devices must be sized in accordance with the Uniform Plumbing Code and any other requirements by the city as set forth herein.

(b) Grease interceptors that include dishwasher effluent shall be sized and located to provide sufficient detention time to allow for cooling of the effluent following guidelines from Appendix H of the Uniform Plumbing Code.

(7) Source Control. All food establishments which deep fry, pan fry, or otherwise generate liquid or semisolid restaurant grease shall maintain a container on site for containment of liquid and semi-solid grease wastes. This liquid or semi-solid grease shall be transported to an approved rendering plant. In no case shall free liquid grease be disposed of directly into fixtures which are connected to the sewer system. Unused butter, margarine, or other solid grease products shall not be discharged to the sewer system through garbage disposals or other means. No exceptions to the prohibitions of this subsection are allowed for fixtures which discharge to the sewer system through an approved grease interceptor. Hauling and recycling of restaurant grease shall be accomplished at a facility holding a state rendering permit, and the user shall maintain a log for disposal as described later in this chapter.

(8) Additives. The use of any additive, such as enzymes, emulsifiers, chemicals, or bacteria, is prohibited.

(9) Grease Interceptor and Oil/Water Separator Pumping and Maintenance.

(a) Each facility required to install and maintain a grease waste interceptor, mechanical device or oil/water separator under this chapter shall provide regular maintenance to the satisfaction of the superintendent in accordance with the requirements set forth in this chapter.

(b) Each person who removes grease waste from the grease interceptor shall, to the extent technically and mechanically possible, remove the entire content of the grease interceptor. Decanting or discharging of removed waste back into the interceptor from which the waste was removed or any other grease interceptor for the purpose of reducing the volume to be hauled is prohibited. All grease interceptors shall be maintained by the user at the user's expense.

(c) Grease Removal and Grease Interceptor Pumping Frequency. All grease interceptors and/or mechanical devices must be pumped out completely once every three months, or more frequently, as required by the city. Exception to this minimum frequency of pumping may be made with special written approval from the director for generators of small quantities of grease wastes. In no case shall the frequency of pumping be less than once every six months. Pumping shall include the complete removal of all contents including floating materials, wastewater, and bottom sludges and solids.

(d) Oil and Debris Removal from Oil/Water Separator Frequency. Oil/water separators must be pumped out completely when the oil level on top reaches two inches in thickness or the debris or sludge level occupies 25 percent of the volume, or more frequently, as required by the city. Pumping shall include the complete removal of all contents including floating materials, wastewater, and bottom sludges and debris.

(e) Failure to Pump. If in the opinion of the superintendent pumping of the grease interceptor or the oil/water separator is required, the owner will be notified in writing and shall arrange to have the grease interceptor pumped and disposed of, at the owner's cost, within 30 days. If the owner or user does not pump within the 30-day time period, the city will arrange to have the interceptor pumped and disposed of, and will present the

owner with a bill for pumping plus an administrative fee of 10 percent. The city shall bill and collect said charges in the same manner as other sewer utility rates are collected including, but not limited to, the sewer lien procedures provided under Chapter [35.67](#) RCW.

(f) Disposal of Grease Interceptor Pumpage. All waste removed from each grease interceptor must be disposed of at a facility permitted by the health department in the county in which the disposal facility is located. Under no circumstances shall the pumpage be returned to any POTW or any sewer.

(g) Maintenance Requirements. Each person who engages in grease waste handling shall maintain all vehicles, hoses, pumps, tanks, tools, and equipment associated with grease waste handling in good repair, free of leaks, and in a clean and sanitary condition. All hoses and valves on grease waste handling vehicles or tanks shall be tightly capped or plugged after each use to prevent leakage, dripping, spilling, or other discharge of grease wastes on any public or private property.

(h) Maintenance Records. A log indicating each pumping of a grease interceptor for the previous 12 months shall be maintained by each food service establishment. A log indicating each pumping of an oil/water separator for the previous 12 months shall be maintained by the owner or his representative. This log shall include date, time, amount pumped, hauler and disposal site, and shall be kept in a conspicuous location for inspection by the Health Department or city personnel. The maintenance record log shall be recorded in the format on file with the city.

(i) Maintenance Reporting. The information required in the maintenance log shall be submitted to the city annually. The reporting period is January 1st through December 31st of each year. The report shall be submitted within 30 days after the end of the reporting period.

(j) Failure to Maintain. If a failure to maintain settling tanks, grit traps, grease interceptors, or oil/water separators results in partial or complete blockage of the building sewer, private sewer system discharge to the city's sewer system, or other parts of the city's sewer system, or adversely affects the treatment or transmission capabilities of the POTW, or requires excessive maintenance by the city, or poses a possible health hazard, the discharger responsible for the facilities shall be subject to costs associated for

cleaning and maintaining the city's sewer. The city shall contract directly with an outside contractor to clear the blockage and/or clean the sewer and bill the owner for the cost of the work, plus an administrative fee of 10 percent. The city shall bill and collect said charges in the same manner as other sewer utility rates are collected including, but not limited to, the sewer lien procedures provided under Chapter [35.67](#) RCW.

(k) Hazardous Material Prohibited. No person shall collect, transport, or handle any hazardous material in any vehicle used for grease waste handling.

(10) Maintenance Log Format.

(a) All pumpage collected by haulers from grease interceptors and oil/water separator shall be verified by a maintenance log which confirms pumping, hauling, and disposal of waste. Maintenance records and maintenance reporting requirements are specified in subsections (9)(h) and (i) of this section. Each person who engages in grease waste hauling shall complete the log each time such person services a grease interceptor. Such person shall provide a copy of the log to the generator of the grease waste.

(b) Type I Maintenance Log Format. The Type I format shall be used when the transporter of the pumpage maintains and operates a grease waste treatment facility where such facility is permitted by the local department of health in the county in which the facility is located. The local health department permit shall specifically cover activities associated with grease waste recycling and/or disposal activities.

(c) Type II Maintenance Log Format. The Type II grease waste interceptor maintenance log format shall be used when the transporter of the pumpage does not maintain and operate a permitted grease waste treatment facility. The Type II format shall be used by all transporters not on the list of permitted and approved grease waste receiving facilities maintained by the city. Any transporter on the approved list who does not dispose of the hauled grease waste at its own permitted treatment facility shall use the Type II format.

(d) All hauling and recycling of restaurant grease which is disposed of at an approved rendering plant shall have a record log for such hauling and disposal (subsection (7) of this section).

(11) Inspection and Entry.

(a) Any and all premises serviced by a grease interceptor and oil/water separator and any and all records pertaining thereto shall be subject to inspection by city personnel for the purpose of determining compliance with this chapter.

(b) Any and all premises and vehicles used by any person performing grease waste handling and any and all records of such person which relate to such person's grease waste handling activities shall be subject to inspection by the city for the purpose of determining compliance with this chapter.

(12) Existing Dischargers of Grease Wastes.

(a) All existing restaurants, cafes, bakeries, lunch counters, cafeterias, meat cutting facilities, bars, or clubs, or hotel, hospital, sanitarium, factory or school kitchens; or other establishments that serve or prepare food where grease may be introduced to the sewer system which do not have grease interceptors; or do not have adequately sized interceptors at the time of adoption of this chapter shall meet the requirement for interception of grease, oils and fats by installing an approved grease interceptor and/or UPC-approved mechanical device.

(b) Approved grease interceptors or devices shall be installed within 12 months of the adoption of this chapter for existing facilities. The city may consider and approve an extension of up to six months for compliance with this requirement based upon extenuating circumstances such as financial hardship. Facilities will be notified in writing by the city.

(c) Existing facilities which currently have grease interceptors and oil/water separators of adequate size to meet the requirements of this article shall submit drawings of the existing installation along with calculations to demonstrate the adequacy of the existing installation. If the superintendent determines that the existing grease interceptor and oil/water separator meets the requirements of this article, the facility will be required to install only the sampling chamber as shown on the standard plan for grease interceptors. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.340 Compliance deadline for pretreatment requirements.

(1) Existing sources covered by one or more categorical pretreatment standards shall comply with such standards within 12 months of the date the standard is effective unless the

pretreatment standard includes a more stringent compliance schedule. Ecology shall establish a final compliance deadline date for any existing user not covered by categorical pretreatment standards or for any categorical user when the state limits for said user are more restrictive than the EPA's categorical pretreatment standards.

(2) New sources and new users shall comply with applicable pretreatment standards within the shortest feasible time. Such time shall not exceed 90 days from the beginning of discharge. Prior to commencing discharge, such users shall install and start up all pollution control devices necessary for compliance with pretreatment standards. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.350 Additional pretreatment measures.

(1) Whenever deemed necessary, the city may require users to restrict their discharge during peak flow periods, designate that certain wastewater be discharged only into specific sewers, relocate and/or consolidate points of discharge, separate sewage waste streams from industrial waste streams, and such other conditions as may be necessary to protect the POTW and determine the user's compliance with the requirements of this chapter.

(2) Users with the potential to discharge flammable substances may be required to install and maintain an approved combustible gas detection meter.

(3) Each user discharging more than 10,000 gallons per day or 10 percent of the average daily flow into the POTW, whichever is less, may be required by the city to install and maintain, on his/her property and at his/her expense, a suitable storage and flow-control facility to ensure equalization of flow over a 24-hour period. The facility shall have a capacity for at least 50 percent of the daily discharge volume and shall be equipped with alarms and a rate of discharge controller, the regulation of which shall be directed by the city. The city may require the user to obtain a wastewater discharge permit solely for flow equalization, or to develop a slug discharge control plan. Such user may be required to install an approved flow measuring device. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.360 Accidental spill/slug discharge control plans.

(1) The city may require any user to install, properly operate, and maintain, at his/her own expense, facilities to prevent slug loads or accidental discharges of pollutants to the POTW. The city may require users to produce and/or implement spill plans developed in compliance with OSHA, health, fire, and Ecology regulations relative to discharges to the POTW. When

such plans are required by the city, the user shall provide:

- (a) A description of discharge practices, including nonroutine batch discharges;
 - (b) A description of stored chemicals;
 - (c) Procedures for immediately notifying the city of any accidental or slug load discharges, with a follow-up written notification within five days; and
 - (d) Procedures to prevent adverse impact from any accidental or slug load discharge, including, but not limited to, the following: inspection and maintenance of storage areas; handling and transfer of materials; loading and unloading operations; control of plant site runoff; worker training; building of containment structures or equipment; and measures for emergency response.
- (2) Users shall verbally notify the city immediately upon the occurrence of a “slug” or “accidental discharge” of substances regulated by this chapter and take immediate actions to correct the situation. This notification shall include location of discharge, date and time thereof, type of waste, concentration and volume, and corrective actions. The user shall follow up with a written notification to the city containing the same information within five days following the accidental discharge.
- (3) Any user who discharges an accidental discharge or slug load shall be liable for:
- (a) Recovery of any resultant expenses, losses, and damages to the POTW;
 - (b) Recovery of any fines or settlements levied upon the city on account thereof by any government agency or court of competent jurisdiction;
 - (c) Applicable fines and penalties assessed by the city for noncompliance with this chapter. (Ord. 04-10 § 1 (Exh. A), 2010).

Article V. Wastewater Discharge Permit Requirements

14.06.380 Requirements to complete industrial user surveys.

The city shall periodically notify new, existing, and potential users of the requirement to complete an industrial user survey form. Upon notification, users shall fully and accurately complete the survey form, and return the completed form to the city within 30 days of receipt.

Each user shall maintain a copy of the latest completed survey form at their place of business. Failure to fully or accurately complete a survey form, or to maintain the latest survey form on the premises where a wastewater discharge is occurring, shall be a violation of this chapter. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.390 Permit requirements – Discharge.

(1) No significant industrial user (SIU) shall discharge wastewater into the POTW without first applying for a wastewater discharge permit from Ecology and obtaining a discharge authorization from the city. The city shall require proof of such permit application. Obtaining a wastewater discharge permit does not relieve a permittee of his/her obligation to comply with all federal and state pretreatment standards or requirements or with any other requirements of federal, state, and local law including the requirement for applying AKART.

(2) The city may require other users, including liquid waste haulers, to apply for wastewater discharge permits to uphold the provisions of this chapter.

(3) The city may also establish, and require users by letter, permit, or rule to implement, best management practices as determined by the applicable control authority to be representative of AKART, or to discontinue use of any substance for which an effective substitute is available which will lessen the potential for violating this chapter or any water quality standard, or which may represent a significant decrease either singly, or in combination with other similar users, in the toxicity of pollutant loadings to the POTW.

(4) The city encourages all users seeking authorization to discharge to the POTW to complete a pollution prevention review before submitting their request to discharge to the city. The city shall require users who must submit a pollution prevention plan under the state of Washington's Hazardous Waste Reduction Act to provide this plan to the city as a condition of initial or continued discharge. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.400 Permit requirements – Dangerous waste constituents.

Users discharging a wastestream containing dangerous wastes as defined in Chapter [173-303](#) WAC (listed, characteristic, or criteria wastes) are required to comply with the following permit provisions:

(1) Obtain a written authorization to discharge the waste from the city, and either obtain specific authorization to discharge the waste in a State Waste Discharge Permit issued by

Ecology, or accurately describe the wastestream in a temporary permit obtained pursuant to RCW [90.48.165](#). The description shall include at least:

- (a) The name of the dangerous waste as set forth in Chapter [173-303](#) WAC, and the dangerous waste number.
- (b) The mass of each constituent expected to be discharged.
- (c) The type of discharge (continuous, batch, or other).

(2) Compliance shall be obtained on the following schedule:

- (a) Before discharge for new users.
- (b) Within 30 days after becoming aware of a discharge of dangerous wastes to the POTW for existing users.
- (c) Within 90 days after final rules identifying additional dangerous wastes or new characteristics or criteria of dangerous waste are published for users discharging a newly listed dangerous waste. (Ord. 04-10 § 1 (Exh. A), 2010).

Article VI. Reporting Requirements

14.06.410 Disclosure of records.

All records and reports required by this chapter, any applicable state and federal regulation, or any permit or order issued hereunder, will be available on site for review by the city during business hours, when activities are being conducted at the facility, and at all reasonable times. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.420 Reports from unpermitted users.

All users not obligated to obtain a wastewater discharge permit from Ecology shall provide appropriate reports to the city as the superintendent may require. The schedule and format of such reports, and the pollutant properties, flow rates, and other pertinent information to be reported, shall be determined by the superintendent. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.430 Reporting requirements – Dangerous waste constituents.

Any user discharging 100 kilograms or more of dangerous waste in any calendar month to the POTW where the pollutants are not reported through self-monitoring under an applicable State

Waste Discharge Permit shall report to the city and Ecology the following information to the extent that it is known or readily available to the user:

- (1) The name of the dangerous waste as set forth in Chapter [173-303](#) WAC, and the dangerous waste number.
- (2) The specific hazardous constituents.
- (3) The estimated mass and concentration of such constituents in waste streams discharged during the calendar month.
- (4) The type of discharge (continuous, batch, or other).
- (5) The estimated mass of dangerous waste constituents in wastestreams expected to be discharged in the next 12 months. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.440 Record keeping.

(1) Users subject to this chapter shall retain, and make available for inspection and copying, all records of information maintained to comply with this chapter, a State Waste Discharge Permit, if applicable, and approved operations and maintenance procedures (inspections, lubrication, repair, calibrations, etc.), if applicable. Users subject to monitoring requirements shall keep records of all monitoring activities required or voluntary. Monitoring records shall include the date, exact place, method, and time of sampling and the name of the person(s) taking the samples; the dates analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses.

(2) These records shall remain available for a period of at least three years. This period shall be automatically extended for the duration of any litigation concerning the user or POTW, or where the user has been specifically notified of a longer retention period by the city. (Ord. 04-10 § 1 (Exh. A), 2010).

Article VII. Sampling and Analytical Requirements

14.06.450 Sampling requirements for users.

(1) Applicable Requirements. Users which discharge into the POTW shall abide by the applicable wastewater monitoring requirements of this chapter, any applicable order, and any state or federal regulation or permit, including a State Waste Discharge Permit. The city may

require self-monitoring and reporting as a requirement of discharge to the POTW, or may conduct its own monitoring of any discharge.

(2) **Categorical User Sampling Requirements.** Categorical users with combined discharges shall measure flows and concentrations necessary to allow use of the combined wastestream formula of [40 CFR 403.6\(e\)](#). Where feasible, such users shall sample immediately downstream from any pretreatment facilities, unless the control authority determines end-of-pipe monitoring to be more stringent or applicable.

(3) **Noncategorical Users.** All other users, where required to sample, shall measure the flows and concentrations necessary to evaluate compliance with pretreatment standards and requirements.

(4) **Data Required.** All sample results shall indicate the time, date, and place of sampling and methods of analysis, and shall certify that the samples are representative of normal work cycles and expected pollutant discharges from the user. Whenever a user samples and analyzes any regulated pollutant more frequently than required, using methodologies in [40 CFR Part 136](#), the results of such analysis shall be submitted with the next required discharge report. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.460 Analytical requirements.

All pollutant analyses required to be reported, with the exception of flow and temperature, shall be performed by a laboratory registered or accredited under the provisions of Chapter [173-50 WAC](#). Laboratories must be accredited for the analyses for which they are performing. Sampling and analysis techniques used in collection, preservation, and analysis shall be in accordance with [40 CFR Part 136](#), unless otherwise specified in an applicable categorical pretreatment standard. Where [40 CFR Part 136](#) does not contain sampling or analytical techniques for the pollutant in question, sampling and analyses shall be performed in accordance with procedures approved by the EPA or Ecology. To ensure that the reported data is valid for determining compliance with requirements, all data shall have a detection level (DL) no greater than 25 percent of the regulatory limit included in this chapter or applicable state or federal regulation (i.e., for arsenic (As), with a regulatory limit of 0.50 mg/l, the DL shall be no greater than 0.125 mg/l). (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.470 City monitoring of wastewater.

The city shall follow the procedures required of users described in BMC [14.06.450](#) and

14.06.460 whenever conducting wastewater sampling of any industrial user, when such sampling is conducted to ensure compliance with this chapter and applicable pretreatment standards and requirements. (Ord. 04-10 § 1 (Exh. A), 2010).

Article VIII. Compliance Monitoring

14.06.480 Right of entry for inspection and sampling.

(1) The city shall have the right to enter the facilities of any user to ascertain whether the purpose of this chapter, and any wastewater discharge permit or order issued under this chapter or by Ecology, is being met and whether the user is complying with all requirements thereof. Users shall allow the city ready access to all parts of the premises for the purposes of inspection, sampling, records examination and copying, and the performance of any additional duties.

(2) Where a user has security measures in force which require proper identification and clearance before entry into its premises, the user shall make necessary arrangements with its security operations so that, upon presentation of suitable identification, the superintendent, or his or her agents or assigns, and representatives of local, state, and federal authority will be allowed to enter without delay for the purposes of performing their respective duties.

(3) The city, in coordination with Ecology for users with State Waste Discharge Permits, shall have the right to set up on the user's property such devices as are necessary to conduct sampling and/or metering of the user's operations.

(4) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the user at the written or verbal request of the city and shall not be replaced. The costs of clearing such access shall be borne by the user.

(5) Unreasonable delays in allowing the city access to the user's premises shall be a violation of this chapter.

(6) Safety Requirements. While performing the necessary work on private properties, the superintendent or duly authorized employees of the city shall observe all safety rules applicable to the premises established by the company and the company shall be held harmless for injury or death to the city employees and the city shall indemnify the company against loss or damage to its property by city employees and against liability claims and

demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.490 Monitoring facilities.

- (1) Each user shall provide and operate at its own expense a monitoring facility to allow inspection, sampling, and flow measurements of each sewer discharge to the city. Such facilities may be required by Ecology or the city. Monitoring facilities shall be situated on the user's premises, unless this would be impractical or cause undue hardship on the user. In such cases, the user must receive permission from the city of Buckley to construct the facility in the public street or sidewalk area, providing it will not be obstructed by landscaping or parked vehicles.
- (2) The city or applicable control authority may require the construction and maintenance of sampling facilities at other locations (for example, at the end of a manufacturing line wastewater treatment system) when deemed appropriate.
- (3) There shall be ample room in or near such sampling facility to allow accurate sampling and preparation of samples for analysis. The user shall maintain the facility, sampling, and measuring equipment at all times in a safe and proper operating condition at his/her own expense.
- (4) All monitoring facilities shall be constructed and maintained in accordance with all applicable city development standards and specifications. At a minimum, the monitoring equipment shall include an inspection/sampling manhole with an internal diameter of no less than 48 inches and a surface opening of no less than 24 inches. Any devices used to measure wastewater flow and quality shall be regularly calibrated to ensure their accuracy. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.500 Access and inspections.

- (1) If the city or an inspector acting as its agent has been refused access to a building, structure or property, or any part thereof, and is able to demonstrate probable cause to believe that there may be a violation of this chapter, or that there is a need to inspect, as part of a routine inspection program of the city designed to verify compliance with this chapter or any order issued hereunder or any wastewater discharge permit issued by Ecology, or to protect the overall public health, safety, and welfare of the community, then the city administrator shall

seek access to the property or building through the Pierce County superior court.

(2) In the event the city administrator has reason to believe a situation represents an imminent threat to public health and safety, and where entry has been denied or the area is inaccessible, an agent of the city may enter in the company of a uniformed police officer in order to determine if the suspected situation exists, and if so, to take such actions necessary to protect the public. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.510 Vandalism.

No person shall willfully or negligently break, damage, destroy, uncover, deface, tamper with, or prevent access to any structure, appurtenance or equipment, or other part of the POTW. Any person found in violation of this requirement shall be subject to the sanctions set out in this chapter. (Ord. 04-10 § 1 (Exh. A), 2010).

Article IX. Confidential Information

14.06.520 Confidential information.

(1) Records kept by the city with respect to the nature and frequency of discharges from any user shall be available to the public without restriction, unless the user specifically requests, and is able to demonstrate to the satisfaction of the city administrator, that the release of such information would divulge information, processes or methods of production entitled to confidentiality under the law.

(2) Users shall clearly mark "confidential" on all area of reports requested to be held confidential from the public. Upon request for this information, the city superintendent shall determine if such information is legally afforded this protection under the law. Only information marked "confidential," which the city superintendent determines qualifies as such, shall be withheld from the public.

(3) Documents claimed as "confidential," however, shall not be withheld from any state or federal agency responsible for oversight of the city's NPDES permit or authority to implement the NPDES, or federal or state pretreatment programs. Wastewater constituents and characteristics and other "effluent data" as defined by [40 CFR 2.302](#) will not be recognized as confidential information and will be available to the public without restriction. (Ord. 04-10 § 1 (Exh. A), 2010).

Article X. Administrative Enforcement Remedies

14.06.530 State responsibility for administrative actions.

The Washington State Department of Ecology is charged with permitting and regulating significant industrial users of the city's POTW. Except for emergency actions, the city shall coordinate actions in regard to control of such users with Ecology. Failure to do so, however, shall not invalidate any action of the city authorized by this chapter. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.540 Notification of violation.

(1) When the city finds that a user has violated (or continues to violate) any provision of this chapter, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the city may serve upon that user a written notice of violation. The city may select any means of service which is reasonable under the circumstances.

(2) Within 10 days of the receipt of this notice, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted by the user to the city. Submission of this plan in no way relieves the user of liability for any violations occurring before or after receipt of the notice of violation. Nothing in this section shall limit the authority of the city to take any action, including emergency actions or any other enforcement action, without first issuing a notice of violation. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.550 Consent orders.

(1) The city is hereby empowered to enter into consent orders, assurances of voluntary compliance, or other similar documents establishing an agreement with any user responsible for noncompliance. Such consent orders shall include specific action to be taken by the user to correct the noncompliance within a time schedule also specified by the consent order.

(2) Compliance schedules, when included in consent orders, may not extend the compliance date beyond any applicable state or federal deadlines. Consent orders shall have the same force and effect as compliance orders issued pursuant to BMC [14.06.560](#) and shall be judicially enforceable. Use of a consent order shall not be a bar against, or prerequisite for, taking any other action against the user. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.560 Compliance orders.

(1) Whenever the city finds that a user has violated, or continues to violate, any provision of this chapter, or order issued hereunder, the city or applicable control authority may issue a

compliance order to the user responsible for the violation directing that, following a specified time period, wastewater services, including collection and treatment, may be discontinued and/or applicable penalties imposed unless adequate pretreatment facilities, devices, or other related appurtenances have been installed and are properly operated and maintained.

(2) Compliance orders may also contain such other requirements as might be reasonably necessary and appropriate to address the noncompliance, including, but not limited to, the installation of pretreatment facilities, additional self-monitoring, and management practices designed to minimize the amount of pollutants discharged into the POTW. A compliance order may not extend the deadline for compliance beyond any applicable state or federal pretreatment standard or requirement, nor does a compliance order release the user of liability for any violation, including any continuing violation. Issuance of a compliance order shall not be a prerequisite to taking any other action against the user.

(3) Failure to comply with any terms or requirements of a compliance order by the user shall be an additional and independent basis for termination of wastewater services, including collection and treatment, or for any other enforcement action authorized under this chapter and deemed appropriate by the city. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.570 Administrative hearing.

(1) A user shall be afforded the opportunity to have or participate in an administrative hearing before the city council to contest the city's determination to impose penalties, recover costs, or establish compliance schedules. A user shall also have the right to a hearing prior to termination of a user's wastewater services.

(2) Notice shall be served on the user specifying the time and place for the meeting, the proposed enforcement action, the reasons for such action, and a request that the user show cause why the proposed enforcement action should not be taken. The notice of the meeting shall be served on an authorized representative of the user (return receipt requested) at least 15 days prior to the scheduled hearing.

(3) An administrative hearing shall not be a bar against, or prerequisite for, taking any other action against the user. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.580 Cease and desist orders.

(1) When the city finds that a user has violated (or continues to violate) any provision of this

chapter, a wastewater discharge permit or order by Ecology, or any other pretreatment standard or requirement, or that the user's past violations are likely to recur and may cause a violation of the POTW's NPDES permit, the city may issue an order to the user directing it to cease and desist all such violations and directing the user to:

- (a) Immediately cease such actions or discharges as described.
- (b) Comply with all applicable pretreatment standards and requirements.
- (c) Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation, including halting operations and/or terminating the discharge.

(2) Issuance of a cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the user. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.590 Emergency suspension of wastewater services.

(1) The city or applicable control authority may immediately suspend wastewater services including collection and treatment, after notice to the user, if it appears to the city that such suspension is necessary to stop an actual or threatened discharge which reasonably appears to present or cause an imminent or substantial endangerment to either the environment, normal operation of the POTW, or the health or welfare of any person or the general public.

(2) Any user notified of a suspension of its discharge shall immediately cease all wastewater discharges. In the event of a user's failure to immediately comply voluntarily with the suspension order, the city shall take such steps as deemed necessary, including immediate severance of the sewer connection or temporary suspension of water service, to prevent or minimize damage to the POTW, its receiving stream, or the danger to the public. The city may allow the user to recommence its discharge when the user has demonstrated that the period of endangerment has passed, unless the termination proceedings in BMC [14.06.600](#) are initiated against the user.

(3) No person shall attempt to prevent the city from terminating wastewater services in an emergency situation, by barring entry, by physically interfering with city employees or contractors, or by any other means.

(4) A user that is responsible, in whole or in part, for any discharge presenting imminent

endangerment shall submit a detailed written statement, describing the causes of the harmful contribution and the measures taken to prevent any future occurrence, to the city prior to the date of any show cause or termination hearing authorized by this chapter.

(5) Nothing in this article shall be interpreted as requiring a hearing prior to any emergency suspension under this article.

(6) Any suspension of wastewater services, emergency or otherwise, shall include notification to the local health department as shown below:

TACOMA-PIERCE COUNTY HEALTH DEPARTMENT

3629 SOUTH D STREET

TACOMA, WA 98418-6813

(Ord. 04-10 § 1 (Exh. A), 2010).

14.06.600 Termination of treatment services (nonemergency).

(1) The city shall have authority to terminate wastewater services, including collection and conveyance to the treatment plant, for any user upon determining that such user has:

(a) Refused access as allowed by this chapter thereby preventing the implementation of any purpose of this chapter.

(b) Violated any provision of this chapter including the discharge prohibitions and standards of Article IV.

(c) Violated any lawful order of the city issued with respect to this chapter.

(2) For users holding permits to discharge to the POTW, violation of any of the following conditions is also grounds for terminating discharge services:

(a) Failure to accurately report wastewater constituents and characteristics.

(b) Failure to report significant changes in operations or wastewater constituents or characteristics.

(c) Violation of any condition of the user's waste discharge permit.

(3) Any suspension of wastewater services, emergency or otherwise, shall include notification to the local health district as shown below:

TACOMA-PIERCE COUNTY HEALTH DEPARTMENT

3629 SOUTH D STREET

TACOMA, WA 98418-6813

(Ord. 04-10 § 1 (Exh. A), 2010).

Article XI. Judicial Enforcement Remedies

14.06.610 Injunctive relief.

When the city finds that a user has violated (or continues to violate) any provision of this chapter, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, the city may petition the Pierce County superior court through the city's retained counsel for the issuance of a temporary or permanent injunction, as appropriate, which restrains or compels the specific performance of the wastewater discharge permit, order, or other requirement imposed by this chapter on activities of the user. The city may also seek such other action as is appropriate for legal and/or equitable relief, including a requirement for the user to conduct environmental remediation. A petition for injunctive relief shall not be a bar against, or a prerequisite for, taking any other action against a user. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.620 Civil penalties.

(1) A user which has violated or continues to violate any provision of this chapter, or order issued hereunder, or any other pretreatment standard or requirement not reserved by a permit by Ecology shall be liable to the city for a maximum civil penalty of \$10,000 per violation. Each day upon which a violation occurs or continues shall constitute a separate violation. In the case of a monthly or other long-term average discharge limits, penalties shall accrue for each day a violation occurs.

(2) In addition to the penalty amounts assessable under subsection (1) of this section, the city may recover reasonable attorneys' fees, court costs, and other expenses associated with enforcement activities, including sampling and monitoring expenses, and the cost of any actual damages incurred by the city including penalties for noncompliance with the city's NPDES permit to the extent attributable to the user.

(3) The city shall petition the Pierce County superior court to impose, assess, and recover such sums. In recommending the amount of civil liability, the city shall consider all relevant circumstances, including, but not limited to, the extent of harm caused by the violation, the magnitude and duration, any economic benefit gained through the user's violation, corrective actions by the user, the compliance history of the user, and any other factor as justice requires, and shall present this analysis as evidence in support of the recommended penalty.

(4) Filing a suit for civil penalties shall not be a bar against, or a prerequisite for, taking any other action against a user. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.630 Remedies nonexclusive.

The provisions in Articles X through XII of this chapter are not exclusive remedies. The city reserves the right to take any, all, or any combination of these actions concurrently or sequentially against a noncompliant user or to take other actions as warranted by the circumstances. (Ord. 04-10 § 1 (Exh. A), 2010).

Article XII. Affirmative Defenses to Discharge Violations

14.06.640 General prohibited discharge standards.

(1) The city may allow an affirmative defense to an enforcement action brought against it for noncompliance with the general and specific prohibitions in BMC [14.06.250](#)(1), (2)(c) and (2)(g). Such defense requires the user to prove to the satisfaction of the city that:

(a) The user did not know or have reason to know that its discharge, alone or in conjunction with discharges from other sources, would cause pass through or interference;

(b) The discharge did not change substantially in nature or constituents from the user's prior discharge when the city was regularly in compliance with its NPDES permit; and

(c) In the case of interference, the user was in compliance with applicable sludge use or disposal requirements.

(2) This defense does not relieve the user from responsibility for enforcement to recover costs. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.650 Upset.

(1) Users shall control production of all discharges to the extent necessary to maintain compliance with applicable pretreatment standards upon reduction, loss, or failure of its pretreatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the pretreatment facility is reduced, lost, or otherwise fails.

(2) A user who wishes to establish the affirmative defense of upset to an action brought for noncompliance with applicable pretreatment standards shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence, that:

(a) An upset occurred; the user can identify the cause(s) of the upset; and it was not due to improperly designed or inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation;

(b) The facility was at the time being operated in a prudent and workman-like manner and in compliance with applicable operation and maintenance procedures; and

(c) The user has submitted the following information to the POTW and treatment plant operator within 24 hours of becoming aware of the upset. If this information is provided orally, a written report must follow within five days:

(i) A description of the indirect discharge and cause of noncompliance;

(ii) The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and

(iii) Steps being taken and/or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

(3) Users will only have the opportunity for a judicial determination on a claim of upset in an enforcement action brought for noncompliance with applicable pretreatment standards. In any such enforcement proceeding, the user seeking to establish the occurrence of an upset shall have the burden of proof. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.660 Bypass.

(1) A user may allow a bypass to occur if it does not cause applicable pretreatment standards or requirements to be violated, and if it is for essential maintenance to ensure efficient

operations. These bypasses are not subject to the provisions of subsections (2) and (3) of this section.

(2) Requirements for Bypasses Subject to Pretreatment Standards or Requirements.

(a) If a user knows in advance of the need for a bypass, it shall submit prior notice to the POTW, at least 10 days before the date of the bypass, if possible;

(b) An industrial user shall give verbal notification to the city of an unanticipated bypass that exceeds applicable pretreatment standards within 24 hours of becoming aware of the bypass, and submit a written report to the city within five days of becoming aware of the bypass;

(c) The written report shall contain a description of the bypass and its cause; the duration of the bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass. The city may waive the written report if the verbal notification has been received within 24 hours.

(3) Exceptions. Bypass is prohibited, and the POTW may take an enforcement action against a user for a bypass, unless:

(a) Bypass was unavoidable to prevent loss of life or personal injury;

(b) 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 which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The user submitted notices as required under subsection (2) of this section.

(4) The POTW may approve an anticipated bypass, after considering its adverse effects, and that the city determines that it will meet the three conditions listed in subsection (3) of this section. (Ord. 04-10 § 1 (Exh. A), 2010).

Article XIII. Charges and Fees

14.06.670 Purpose.

- (1) The city may adopt reasonable fees for reimbursement of costs of setting up and operating the city's pretreatment program.
- (2) These fees relate solely to the matters covered by this chapter and are separate from all other rates or charges for sewer services; provided, that the city shall collect said charges in the same manner as other sewer utility rates are collected, including, but not limited to, the sewer lien procedures provided under Chapter [35.67](#) RCW.
- (3) Fees may include:
 - (a) Fees for wastewater discharge authorizations, including the cost of processing the authorization applications, public noticing, issuing and administering the authorization, and reviewing monitoring reports submitted by users;
 - (b) Fees for modifying or transferring authorizations;
 - (c) Fees for monitoring, inspection, surveillance and enforcement procedures including the cost of collection and analyzing a user's discharge;
 - (d) Fees for reviewing and responding to accidental discharge procedures and construction;
 - (e) Fees for preparing and executing enforcement action;
 - (f) Fees for filing appeals;
 - (g) Fees for high strength waste and industrial process flow; and
 - (h) Other fees as the city may deem necessary to carry out the requirements contained herein.
- (4) All fees or charges will be collected by direct billing. Unless the city has been made aware of extenuating circumstances that would prevent prompt payment, all fees are payable within 30 days of the billing. Fees past due will be considered a violation of this chapter. Users not paying fees within 60 days of the billing period may be subject to termination of service. The

city may change existing or adopt new fees. (Ord. 04-10 § 1 (Exh. A), 2010).

Article XIV. Miscellaneous Provisions

14.06.680 Severability.

The provisions of this chapter are severable, and if any provision of this chapter, or application of any provision of this chapter to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this chapter, shall not be affected thereby. (Ord. 04-10 § 1 (Exh. A), 2010).

14.06.690 Regulatory conflicts.

All other chapters and parts of other chapters inconsistent or conflicting with any part of this chapter are hereby repealed to the extent of the inconsistency or conflict. (Ord. 04-10 § 1 (Exh. A), 2010).

The Buckley Municipal Code is current through Ordinance 20-19, passed October 22, 2019.

Disclaimer: The city clerk's office has the official version of the Buckley Municipal Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

City Website: <http://www.cityofbuckley.com/>

City Telephone: (360) 829-1921

[Code Publishing Company](#)

APPENDIX F

**CITY OF BUCKLEY COMPREHENSIVE PLAN (2015), EPA
WATER COMPLIANCE INSPECTION REPORT, AND
PIERCE COUNTY ORDINANCE NO. 2011-36s**



City of Buckley

**P.O. Box 1960 ♦ Buckley, WA 98321
(360) 829-1921 ext. 7801**

2015 Comprehensive Plan

Contents:

1. General introduction to the comprehensive plan
2. Element 1, Land use element
3. Element 2, Housing element
4. Element 3, Economic development element
5. Element 4, Urban development element
6. Transportation element – To be adopted 2016
7. Element 6, Parks element
8. Utilities element – To be adopted 2016
9. Capital facilities element – To be adopted 2016
10. Maps

Approved under Ordinance 31-15 on **December 8, 2015.**

Mayor Pat Johnson

Council Position #1: Nora Lyn Rose

Council Position #2 - Cristi Boyle Barrett (Mayor Pro Tem)

Council Position #3 – Marvin Sundstrom

Council Position #4 – James Montgomery

Council Position #5 – John Leggett

Council Position #6 – Milt Tremblay

Council Position #7 – Bryan Howard

General Introduction to the Comprehensive Plan

Contents:

- 1. Growth Management**
 - a. State rules
 - b. Regional rules
 - c. County rules
 - d. Local rules
- 2. Vision**
- 3. Planning Area**
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- 5. Comprehensive Plan Map**
- 6. Population**
 - a. Table 0.1 Buckley population over three decades
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- 7. Definitions**

1. Growth Management.

Washington cities and counties have prepared comprehensive plans for many years; however, growth management in Washington took on new meaning with the passage of the Growth Management Act (GMA) by the Washington Legislature in 1990.

The GMA was enacted in response to rapid population growth and concerns with suburban sprawl, environmental protection, quality of life, and related issues. The GMA has been amended several times, and is codified in many chapters but primarily in [Chapter 36.70A RCW](#).

The GMA requires the fastest growing counties and the cities within them to plan extensively in keeping with [state GMA goals](#) on:

- ♦ sprawl reduction
- ♦ concentrated urban growth
- ♦ affordable housing
- ♦ economic development
- ♦ open space and recreation
- ♦ regional transportation
- ♦ environmental protection
- ♦ property rights
- ♦ natural resource industries
- ♦ historic lands and buildings
- ♦ permit processing
- ♦ public facilities and services
- ♦ early and continuous public participation
- ♦ shoreline management

In addition to the 13 original GMA goals, the legislature added the goals and policies of the shoreline management act as the fourteenth GMA goal. (See [RCW 36.70A.480](#).) The shoreline goals may be found at [RCW 90.58.020](#).

[Twenty-nine counties](#) are either required to fully plan under the GMA or have chosen to do so. These counties make up about 95 percent of the state's population. The remaining ten counties must plan for critical areas and natural resource land only under the GMA.

The GMA provides a framework for regional coordination, and counties planning under the GMA are required to adopt county-wide planning policies to guide plan adoption within the county and to establish urban growth areas (UGAs). Local comprehensive plans must include the following elements: land use, housing, capital facilities, utilities, transportation, and, for counties, a rural element. Shoreline master program policies are also an element of local comprehensive plans. Implementation of required parks and economic development elements is on hold until adequate state funding is available. Buckley's comprehensive plans also includes two optional elements: Urban Design (E-4) and Parks & Recreation (E-6).

The GMA establishes the primacy of the comprehensive plan. The comprehensive plan is the starting point for any planning process and the centerpiece of local planning. Development regulations (zoning, subdivision, and other controls) must be consistent with comprehensive plans. State agencies are required to comply with comprehensive plans and development regulations of jurisdictions planning under the GMA.

The [Growth Management Hearings Board](#) (part of the new Environmental and Land Use Hearings Office) resolves disputes concerning comprehensive plans and development regulations adopted under the GMA. The Governor has the authority to impose sanctions on cities, counties, and state agencies that do not comply with the GMA, as determined by a hearings board.

The GMA is the basis for regulatory reform legislation passed in 1995 to improve how permits are issued in Washington State.

a. State rules.

The state requires comprehensive plan updates every eight years. Buckley's previous comprehensive plan was adopted in 2005, this update is due to be at the State Department of Commerce by June 30, 2015. Because of the state's economic downturn, the state set 2015 for Pierce County, and the cities within Pierce County, to finish their updates.

b. Regional rules.

Central Puget Sound is represented by a group of four counties – Pierce County, Snohomish County, Kitsap County, and Thurston County. The counties meet monthly in a group called the Puget Sound Regional Council (PSRC). This group created and passed a plan for our counties called *Vision 2040* (Vision). This plan includes goals and policies each county must follow (<http://www.psrc.org/assets/366/7293-V2040.pdf>).

c. County rules.

Pierce County, in turn, is represented by leaders of each of its cities in a group called Pierce County Regional Council (PCRC). In response to PSRC's *Vision 2040*, Pierce County created a set of countywide planning policies (CPPs) for each city within its jurisdiction to follow (<http://www.co.pierce.wa.us/DocumentCenter/View/6998>).

The County-wide Planning Policies provide a framework from which the comprehensive plans of the local jurisdictions within Pierce County are to be developed. This common framework provides for consistency among the comprehensive land use plans. The policies address issues that uniformly affect the county as a whole, including:

- ♦ Affordable housing (AH)
- ♦ Agricultural lands (AG)
- ♦ Amendments & transition (AT)
- ♦ Buildable lands (BL)
- ♦ Community & urban design (CU)
- ♦ Economic development and employment (ED)
- ♦ Fiscal impact (FI)
- ♦ Health & well being (HW)
- ♦ Historic, archaeological and cultural preservation (HAC)
- ♦ Natural resources, open spaces and protection of environmentally sensitive lands (Nat)
- ♦ Rural areas
- ♦ Siting of essential public capital facilities of a countywide or statewide significance (SPF)
- ♦ Transportation facilities and strategies (Tran)
- ♦ Urban growth areas (UGA)

d. Local rules.

Because this version of the comprehensive plan is only an update and not a new comprehensive plan, no new visioning process was used. The vision stated in the last comprehensive was edited and clarified.

In reviewing this document, however, several things were noticed and are being updated or clarified. For example, the 2005 Comprehensive Plan's first element contained general information for the entire comprehensive plan as well as specific information for the Land Use Element. This caused some confusion and the sections were separated into this section, the General Introduction to the Comprehensive Plan, and Element 1, Land Use.

It was also noticed that several ordinances were out-of-date and the commission took time to review and update those regulations, particularly concerning mobile homes and day cares, which are part of Element 2, Housing.

2. Vision.

The Comprehensive plan is the city's framework for the future. It is the plan that documents the future the citizens want. It is the plan that identifies how we can make the best possible town that we can make. Through this plan we assert that our city's citizens aren't just numbers – we are family and friends.

The city is committed to ensuring that the components that contribute to its quality of life (e.g. affordable housing, natural environment, good schools, efficient government, and excellent infrastructure) are available for residents and for future generations. Buckley citizens want this city to become a more vibrant and attractive place to live, work, and play. This will involve preserving and leveraging the city's existing qualities while creatively responding to the demands brought on by societal change and urban growth.

Buckley's key strengths are its small town character and its natural setting. The primary challenges Buckley faces include economic revitalization and population growth and to accommodate that growth while preserving and sustaining the city's natural environment and small town character.

Addressing these challenges in the context of strengths and weaknesses, the Buckley Comprehensive Plan update focuses on three areas:

1. Preserve Buckley's town identity and character.
2. Develop the economic viability in the downtown core and State Highway 410.
3. Promote outdoor recreational activities.

These three focus areas, while distinct, also are interdependent, and have potential for mutual positive reinforcement. For example:

Our charming small-town atmosphere could serve as a magnet for tourists.

Our small-town character could be enhanced through a pedestrian-oriented downtown in which people meet face-to-face.

New housing centered around downtown would bring more residents to downtown businesses while helping to preserve rural character outside the center.

Recreational facilities could be shared between residents and tourists.

Buckley's downtown commerce could be supported by recreational visitors.

Preservation of town identity and character.

If Buckley grows in a manner desired by its residents, prevailing economic and social trends such as the shift to a service economy, shrinking household size, and an aging population, could become assets rather than threats. All the benefits of a tightly knit small community can remain and likely could be enhanced. With smart planning, Buckley's vision is to have it all: a vibrant local economy based in a compact, friendly downtown, surrounded by a relatively undisturbed rural landscape and the great outdoors beyond; a place where all are invited to experience fresh air and familiar faces.

Economic development of the downtown core and State Highway 410.

Buckley's downtown appears to be a town set in the early 1900s. Its historic American small town form has a great potential for economic development based on small-scale retail, buttressed with multi-family housing or mixed-use commercial/residential development.

Creating an attractive Hwy 410-to-downtown connection could provide amenities to commuters and could promote niche services and opportunities that the City offers.

Buckley is a gateway to Mt. Rainier, both to Carbon Glacier and to the rest of the mountain parks, and to its surrounding outdoor recreation areas. Local investment in this outdoor recreational infrastructure could allow Buckley to become a staging ground for niche markets that serve the outdoor enthusiast.

Promotion of outdoor recreational activities.

Buckley is one of the gateway communities in the Carbon River Corridor. Visitors headed to Mount Rainier's Carbon Glacier or scenic drive toward the White River Corridor travel through Buckley – either through Buckley then Wilkeson and then the Carbon River entrance, or through Buckley, Enumclaw, Greenwater, then on to Sunrise, around the mountain. or Yakima.

Because of the proximity to the mountain, it is discussed in the economic development element (Element 3) that the city should promote facilities and businesses for the outdoor enthusiast.

3. Planning area.

Incorporated in 1889, the city supported many land uses, from mining and logging to logging and agriculture, particularly dairy farming. Economic downturns in logging and agriculture caused the residents to find other areas of commerce and income. This history gives the city characteristics to honor in selection of its art. The location of the train station, for example, can be used for a concession stand or information booth at Main Street on the Foothills Trail, which was once the railway.

The city took advantage of public land sales in the recent past and owns shoreline parcels to the west of city limits. A 5-acre lot between the Buckley-Sumner Highway and Hinkleman Road was donated to the city for a park. Both areas are lands to be annexed into the city in the near future.

The City of Buckley encompasses a total of 2,500 acres or approximately four square miles. Although certain uses are allowed within the different zones many parcels are vacant or contain nonconforming uses.

a. Natural Features

The City of Buckley lies on White River plateau between what is known as the Puget Trough and the southern Washington Cascades. Because it is close to the Cascade foothills most of the plateau is relatively flat with steep slopes rising in the southerly and southeasterly portion of the City. The direction of drainage is generally to the north. The elevation of the developed part of the City is 700 to 750 feet.

The city lies on a geologic formation from the Osceola mud flow, which creates an impervious layer beneath the soil. The predominant soil in Buckley is Buckley Loam, which is a poorly drained, hydric soil, formed subsequent to the Osceola mud-flow from Mt. Rainier. The primary limitation for this soil is the lack of permeability and a high water table in the winter and spring.

Buckley lies within the Puyallup River drainage basin. The White River, which lies along the northern boundary of the City, is a tributary to the Puyallup River and is considered an important salmon source. Mud Mountain Dam regulates stream discharge in the lower reaches of the White River, so most flooding in Buckley was eliminated.

The city purchased land along the south shore of the White River from Puget Power; a shoreline trail is planned through these lands from The Grange area at 278th to the eastern city limits at Levesque. (Please see Element 6, Parks & recreation.)

The area south of the river is zoned "S" for Sensitive. This area contains various sensitive areas, including wetlands, steep slopes, floodplains, and an aquifer recharge area. On the east side, the Cascade Water Alliance operates the barrier dam to channel water from the White River through a flume to Lake Tapps to the west.

The comprehensive plan elements serve to protect these sensitive areas, but specific goals are mentioned in the Land Use Element, E-1.

4. Surrounding area

The City of Buckley consists of about four square miles and shares its northern border with the White River and a portion of King County. East of Buckley across the White River, lies King County and Enumclaw. Beyond Enumclaw is Greenwater, Mt. Rainier, and Yakima.

The lands adjacent to the city are a mix of low-density zones in Pierce County, specifically R20 (Rural 20), R10 (Rural 10), FL (Designated Forest Land), ARL (Agricultural Resource Land), and PR (Park & Recreation).

Buckley contains two state highways, SR 410 connects Sumner to Yakima; SR 165 connects Buckley to Wilkeson, Carbonado, and Mt. Rainier's Carbon Glacier as well as a connection to SR 162, which leads to South Prairie and Orting.

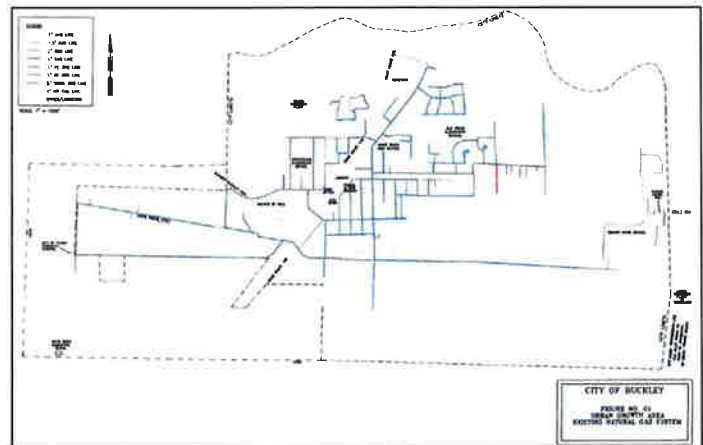
Coming from west to east along SR 410, the City of Sumner contains industry and fairly smoothly connects with the City of Bonney Lake. Bonney Lake is adjacent to county urban growth areas, and is attempting to annex these areas. Between Bonney Lake and Buckley is several miles of county land that is zoned for agriculture and low-scale commercial uses. Much of the land is underdeveloped or undeveloped.

South of SR 410 between Bonney Lake and Buckley, some of the land is developed to nearly urban density in plats outside of existing city boundaries.

5. Comprehensive Plan Map (For map see Attachment A)

One of the key items a comprehensive plan is to deliver to the city residents is a map showing where uses ought to be, and where the future city limits ought to be (Urban Growth Area or UGA). The Comprehensive Plan Map is to reflect all of the goals listed in the Buckley Comprehensive Plan. It should ensure efficient provision of services, diverse and affordable housing opportunities, strong economic centers, easy access to goods and services, and high-quality public spaces that foster community interaction.

The 2005 comprehensive plan showed an area west of the city that “squared out” the city limits from the south city line to the elementary school and up toward Hinkelman. This update expands that area to reflect land adjacent to SR 165 and lands to the east upon which the city either leases or uses for water service. The map also shows parcels outside the city limits that the city owns and will annex and time and funds permit.



The 2005 comprehensive plan introduced mixed use zones in the goals and policies the city developed. The mix of uses includes commercial and residential uses within some commercial zones, single family residential to include duplexes and multiplexes as permitted uses. Over the years, all but light industrial and general commercial permit mixed use development; and all but the R-20,000 zone allow multifamily development.

Once the comprehensive plan map is developed, the zoning map implements these uses. To implement the 2005 comprehensive plan, new zoning designations were created. The 2015 update updates population numbers and clarifies the comprehensive plan language. In the 2015 update the planning commission found that certain language did not express what it appeared to mean, or no longer expressed a current need. Certain regulations didn't reflect certain state laws that were enacted since 2005.

Land use designations.

Uses in the comp plan are characterized as follows:

- **Industrial & General Commercial (I&GC);** in this area uses are to be more intense commercial, auto-oriented businesses, and include light manufacturing, metal working, higher levels of noise, and possible use of hazardous materials. This district is not conducive to residential development.
- **Commercial & Mixed Use (C&MU);** in this area uses are to be more people-oriented with less intense retail than in I&GC. Uses are to include residences above retail and provide a buffer zone around commercial zones in which single family and high density multifamily uses are allowed.
- **Urban Higher Density (UHD);** in this area multifamily, mobile home park development, and single family residences are allowed with no commercial retail intrusion. Density ranges from 2,150 to 8,600 square feet (sf) per unit. Single family development is discouraged by requiring a greater lot size than for in most single family zones.

- **Urban Lower Density (ULD);** in this area, single family, duplexes, and multi-plexes are allowed where sewage utilities are available. These residential uses are also restricted from commercial retail. Density ranges from 4,500 to 20,000 sf per unit.

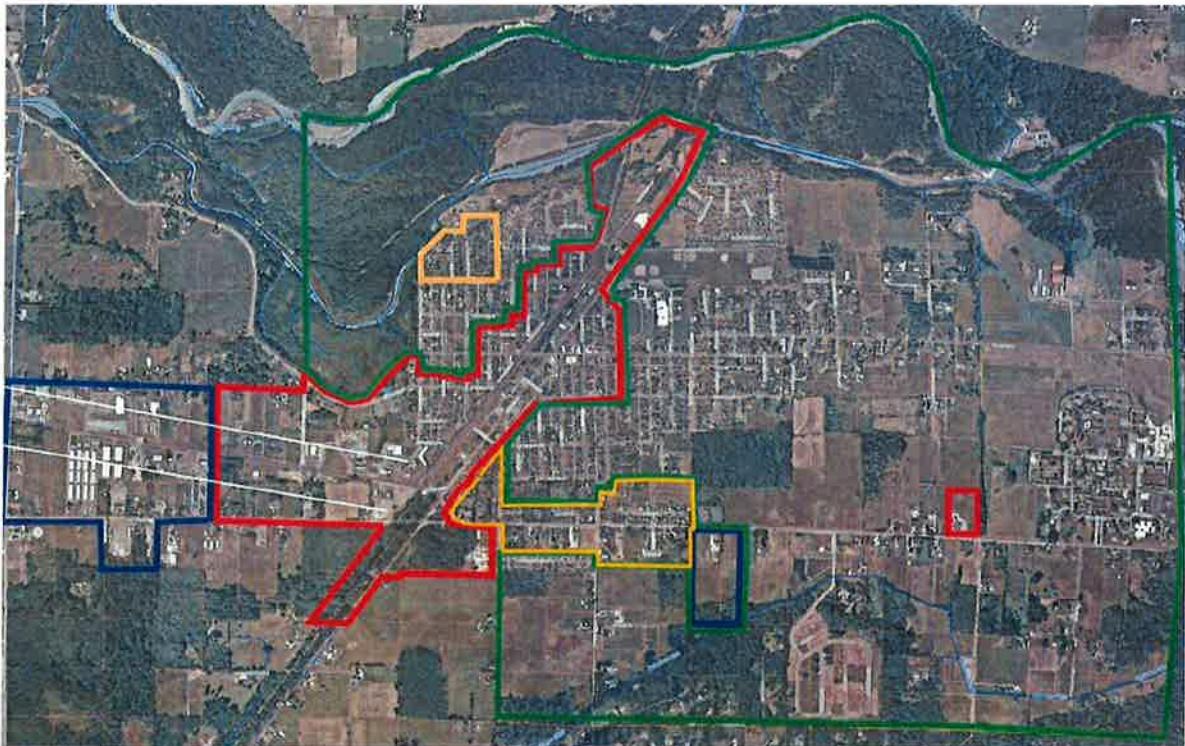
Boundaries were drawn with I&GC in the southwest portion where SR 410 runs east/west, C&MU along the SR 410 corridor where it runs northeast/southwest, UHD in two areas one in the northwest corner and one along Ryan, and the rest, largely, as ULD.

After using the Comprehensive Plan Map for a decade, it is apparent that several things are needed:

- Buffer areas around commercial areas, which could expand the C&MU area
- The I&GC area needs to include more of the C&MU area

After using the zoning map for several years, it is apparent that several things are needed:

- Zoning classifications in the east area need to match the comprehensive plan designations of I&GC
- Light Industrial (LI) and General Commercial (GC) uses on the ground in the west area of the city don't always match the zone; the uses should be diversified to include the non-conforming uses that work well in the area, or the land rezoned to match those uses
- Some GC uses sometimes work well with high density residential, which is not currently allowed
- The Neighborhood Mixed Use (NMU) zone is our buffer zone between commercial and residential zones, but is only buffering a small area of the city's commercial lands. The NMU needs to be expanded to buffer all commercial zones around the northeast SR 410 corridor and other commercial zones
- Some parks and publicly-used lands are zoned commercial and should be rezoned to Public (P)



6. Population.

All cities and towns contain people. It's the coming together of these people that determine the city's or town's characteristic and personality. The number of people, the people's ages, the income levels, the education levels all indicate the potential characteristics and the potential needs the people will likely have and the things the city or town must provide to meet the needs of its population.

In the last comprehensive plan it was considered a safe assumptions that land value would rise, growth would occur, and cities would benefit from development. But after the 2005 comprehensive plan was adopted a great financial turmoil came in 2008. Housing values are just beginning to increase in value in this area. No assumptions about land value or growth may be made safely any more.

Allocation.

The Growth Management Act requires each county to allocate a population for each of its cities to accept in the following 20 to 30 years. Pierce County allocated populations for its cities to meet by 2030, calculating its 20 years from the 2010 census.

Each allocation is different for each city and is based in part on the amount of undeveloped land each city contains. Buckley contains much undeveloped land – both commercial and residential. In addition to the things the county's "Buildable Lands" report can quantify, this city also contains a good quality of life and residents who take pride in their city. Buckley residents know this is a good place to live.

Buckley's population allocation target is 7,500 people by the year 2030, an increase of 3,146 people in 20 years. For comparison, in 1990, 20 years before the last census, our population was 3,516, a difference of 838 people. The low growth in the past 20 years can be attributed to two major items: an inadequate sewer system to serve any new development and a flailing economy. With the help of grants, the city fixed the sewer system and removed the moratorium; and the nation is slowly recovering from worldwide economic difficulties. For a synopsis of population growth since 1990, please see Table 0.1.

Table 0.1 Buckley population over three decades and projected to 2035.

1990*	2000*	2010*	2011**	2012**	2013**	2014**	2030***	2035
3516	4,115	4,354	4,345	4365	4,370	4,430	7,500	7,888

* Census population given by the federal government

** Estimated population provided by the Office of Financial Management (OFM)

*** Target Population given by Pierce County under county ordinance #2011-36s

The Growth Management Act requires the comprehensive plan consider 20 years of growth, and although the county is viewing 2030 as 20 years from the census, the city is looking toward 20 years from the published document, or 2035.

To achieve the allocated number of 7500 in the year 2030, the city must grow at about 3 percent per year. The historic growth percentage is less than 2 percent. The city chooses to "relax" after achieving its 15-year-3-percent growth spurt and rest at about 1 percent growth for a few years. This will bring the population to 7,888 in 2035.

One of the things the Growth Management Act requires each city show in its land use element is the ability to grow to the planned or allocated number. The city's existing unit number, according to the 2010 census, is 1,669 with 78 vacant units. This capacity is shown in the county's Buildable Lands Report Table 8 (please see Table 0.2 below). This document shows various assumed densities in our various zones. While these assumed densities were determined by conferences with the city, the assumed density capacity of 1,354 is a bit low.

For example, in the report our most dense residential zones' densities are similar to our most dense single family zone. And the single family zones don't consider the greater density allowed for duplexes and triplexes. If we assume builders will build to nearly the highest density possible, then the city gains 226 units.

Table 0.2, Buildable Lands Table 8.

Zone	net acres	assumed	unit capacity	pipeline	Numbers increased over Buildable Lands assumptions
R-6,000	35.84	6	215	171	Increased 1 out of a possible 7 du/ac
R-8,000	152.17	5	761	65	Increased 1 out of a possible 5 du/ac
R-20,000	26.82	2	54		Increased 0
HDR	6.25	10	63		Increased 5 out of a possible 21 du/ac
NMU	26.94	9	242		Increased 4 out of a possible 12 du/ac
HC	0.02	3	0		decreased 2
CC	1.39	5	7		Increased 2
P				2	Increased 0
			1,342	238	Total unit number: 1,580

Trends.

In 20 years the newborns today will be high school graduates and the 45 to 54 year olds will be 65 and older recreating at the senior center. Assuming the city attains the allocated populations numbers and it maintains the percentages of age groups it maintained through these few decades, the city will contain 509 children under the age of 5, 1,613 people between 5 and 19, 1,124 people aged 45 to 54 years, and 850 people older than 65. (See Table 0.5.)

The estimated averages show two definite trends: a decrease in the percentage of children and young adults that live in the city, and an increase in percentages of adults older than 55.

This could mean a reduction in child-centered play equipment at our parks and an increase in adult-centered recreation equipment at our parks and "tot lots." It could mean an increase in mixed facilities at these "tot lots" to enable grandparents to take visiting grandchildren near their homes to play. (Please see Element 6, Parks & recreation.)

This apparent trend could indicate a need for more adult care facilities, more senior housing, and agencies or services in which our older generation can educate, help, or care for the younger generation.

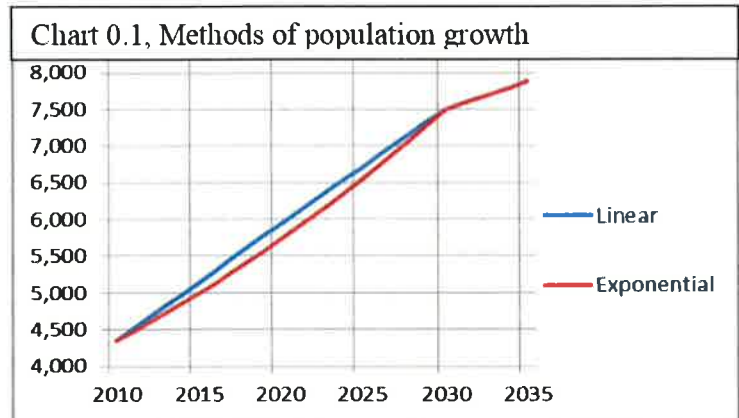
Building.

Dividing the average household size into the number of people needed to meet the 2030 population allocation, 1,258 new housing units need to be constructed. These units can be single family homes, apartments, condominiums, mixed-use developments, or group homes. Together with construction of houses, streets, utilities, and increased service capacities need to be developed.

We have at least two ways to look at population growth and, therefore, two ways to plan for construction growth (see Chart 0.1, which is based on Chart 0.2):

1. Linear. The easiest is a linear expression where the population grows at a constant number. This would appear as a straight line from the current population to 7,500. Placed on a chart, that would require a population change of 157 people (63 houses) each year, or five houses each month for 20 years.

2. Exponential. The other way is looking at growth exponentially, sort of like interest at the bank. In this method the percentage change stays the same, but the effect of multiplying the rate each year gives higher numbers each year as the population grows. This would vary the yearly population growth from 120 people the first year to 201 people the 15th year, or 48 houses the first year to 83 houses the last year. This would yield a range of four to seven houses each month.



Whichever way growth is perceived, population growth is a continually changing series of numbers based on whether reality meets the assumptions from which the figures were made. Assumptions in this analysis include the following:

Table 0.3 Population assumptions

Assumption 1.	
The 2010 census gave accurate numbers for households, vacancies, and population for the City of Buckley. The average household size was 2.5, the number of unit vacancies was 78, the population was 4,354.	Population: 4,354
Assumption 2.	
Vacancies that were reported will be no longer vacant by 2015. This would add 78 x 2.5, or 195 people, to the population.	+195
	=4, 549
Between 2010 and now, building permits were requested for units. This is reported to the Office of Financial Management (OFM), which creates estimated populations for each city; this figure doesn't include the units that were vacant.	
Assumption 3.	
Houses will be constructed in 2014. The number should be at least the same number as in 2013, which was building permits for 20 units, which will yield 50	+50

people.	
	=4,599
Assumption 4	
The OFM figures are accurate. These show the 2013 population to be 4,370, which together with the population from Assumption 2 and 3, yields a current population of 4,615. This will be used for the starting population of 2015.	
Assumed 2015 population	= 4,615
Population increases will come from several sources. One will be people populating existing housing, another will be from people building new dwellings for themselves or to rent to others.	
Each zone has a number of square feet required for each unit developed, such as 6,000 sf for the R-6,000 zone, 8,000 sf for the R-8,000 zone and so forth. Each zone except for the R-20,000 zone has the opportunity for greater density for attached units, such as duplexes or triplexes. The high density residential zone uses 2,150 for the highest density calculation.	
To develop a lot, roads, parking lots, driveways, storm ponds, or other amenities must be created on the lot. Lot area calculations for new lots cannot include area for streets. To ensure each lot contains the minimum amount needed for the plat, 30 percent of the gross lot area is removed from the lot before the density number is generated. For example, if a lot were 100,000 sf in size and in an R-10,000 zone we would subtract 30 percent of the lot, which yields 70,000 sf, divide by 10,000 and come up with a possible density of 7 units.	
Assumption 5.	
a. The standard density units of 6,000 sf, 8,000 sq, 20,000 sf and 2,150 sf will be used for density calculations.	
b. Streets require 30 percent of the gross lot area for subdivisions.	
Assumption 6.	
A multifamily development referred to as the "Meadowbrook Development Agreement" or the "Sternoff Development Agreement" agrees to allow the area currently used as a mobile home park for multifamily development for 220 units. This will occur within 10 years.	+550
2025 population A	=5,165
In the past few years three plats were approved. A plat is the plan that shows a subdivision process: lots, tracts, streets, easements, and so forth. One plat was recorded with the county and is called Elk Heights, but has building permit restrictions; two plats were approved preliminarily and will likely be under construction in 2015.	
Assumption 7.	
Elk heights contains 76 lots; 33 are constrained because of septic issues, the remainder are being built upon and are included in the OFM projections in Assumptions 3 & 4. Eighteen lots are currently open for building permits, half of which may be built in 2014, which leaves nine lots for construction in 2015, with	+105

a population of 22.5 people. The 33 lots upon which a building restriction is stated on the Elk Heights plat will be resolved within five years and building will occur within 10 years. Thirty-three lots will yield 82.5 people.	
Plus 2025 population B	=5,270
One of the two plats, Nanevicz, is located in the north central part of the city, just east of a subdivision called Copperwynd. It will contain 65 lots and connect River Avenue with Sergeant Street, which is connected to Collins Road. This will add a population of 162.5.	+162.5
Plus 2025 population C	=5,432.5
The other plat is called Van Sickle Landing and is in the center of the city adjacent to Ryan Road. It will contain 177 lots and provide future connections from Ryan to Mason through Sergeant and Spruce streets. East-west future connections are planned for Couls and Jefferson to the east (the area west is a wetland). This will add a population of 442.5	+442.5
Plus 2025 population D	+5,875
Assumption 8.	
All lots from these two subdivisions will constructed within 10 years. Together with the assumptions above.	
Pipeline 2025 populations A+B+C+D	=5,875
Assumption 9.	
The three plats mentioned above will install infrastructure improvements that may ease the cost of development for smaller developers. Because improvements are being constructed for the above-mentioned plats, others likely will subdivide either by long plat (more than four lots in a plat) or by short plat (four or fewer lots). If parcels adjacent to just one of these subdivisions subdivide and develop to the maximum extent possible, it will raise the population by 209.68 units or 524.21 people.	+524.21
Plus 2025 population E	=6,406
Not all of the vacant lots will develop to capacity and some single family lots will divide in two or three lots.	
Assumption 10.	
It is likely that single family short plats will occur throughout the city, particularly close to the new plats. Thirty single family lots close to the “pipeline” plats are likely development sites, which would yield 30 new lots if each lot short platted into two lots for a population gain of 75.	+75
Likely 2025 population	=6,474
Assumption 11.	
The city currently has adequate utilities for growth, which will allow growth to occur at a 3 percent rate until 2030.	
The 2030 population will be:	=7,500
Assumption 12.	
The population after 2030 will return to the previous 1 percent rate.	
Likely 2035 population:	=7,888

$$* r=((F/P)^{(1/t)})-1$$

Map 0.1 Currently approved projects.

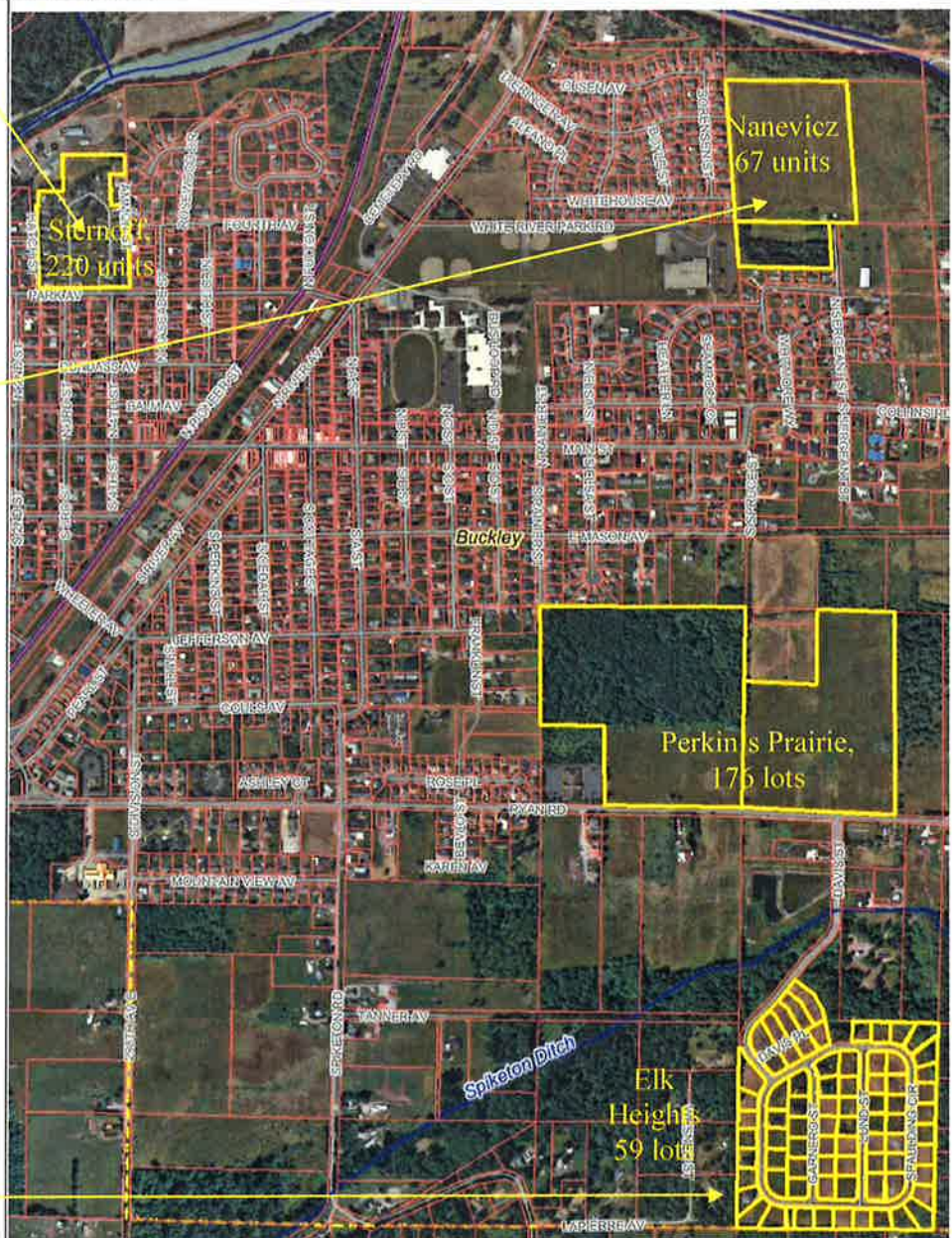
The Meadowbrook Development Agreement (Sternoff) allows 220 units on the mobile current mobile home park site.

Preliminary plats Nanovich and Perkin's Prairie together contain 244 lots.

Nanovich will connect Sergeant Street with Dieringer Avenue and continues to River Avenue.

Perkin's Prairie will connect Ryan Road with Mason Avenue and provide a large area to its northwest to preserve its existing wetland.

Elk Heights received final plat approval, but the developer suffered from bankruptcy before the final roads went in. Forty-three lots received septic approval before construction and 33 lots are restricted from construction until a sewer line can be brought into the plat.



Data & Tables.

The current household family size averages 2.5 people for each occupied house. According to the 2010 census, homeowners who resided in their homes had a household size of 2.66 and renters had a household size of 2.18; this was averaged to 2.5 by the census data workers and used throughout the 2015 comprehensive plan.

Table 0.4 Short synopsis of population classification through three decades.

#	Ages	Percentages
According to the 1990 census data, Buckley contained 3,516 people:		
1.	Children from newborn to 5 years	6.9 percent
2.	School age children from 5 to 17 years	19 percent
3.	Residents aged 65 and above	10.2 percent
According to the 2000 census data, the City of Buckley contained 4,145 people.		
4.	Children newborn to 5 years old	6.5 percent
5.	School aged children between 5 and 17 years	22 percent
6.	Residents aged 65 and older	9.1 percent
In the 2010 census, the city population was 4,365 with 79 units vacant.		
7.	Children newborn to 5 years old	5.95 percent
8.	School aged children between 5 and 17 years	16.70 percent
9.	Residents aged 65 and older	13.05 percent

Table 0.5 Comparison of 2010 census data for Buckley and Pierce County.

Age Group	Buckley	Percent of city	Pierce County	Percent of County
Total population:	4,354	100	795,225	Buckley is 0.55% of county
Total occupied households	1591	1,591/1,669 = 95%	299,918	299,918/325,375 = 92%
Vacant households	79	5%		
Gender & Age				
Male	2,191	50.3	392,934	49.41
Female	2,163	49.7	402,291	50.59
4 years & younger	259	5.95	55,663	7.00
5 to 9 years old	245	5.63	53,579	6.74
10 to 14 years	295	6.78	54,838	6.90
15 to 19 years	282	6.48	56,289	7.08
20 to 24 years	286	6.57	56,203	7.07
25 to 34 years	525	12.06	112,050	14.09
35 to 44 years	587	13.48	108,427	13.63
45 to 54 years	682	15.66	118,943	14.96
55 to 59 years	345	7.92	50,100	6.30
60 to 64 years	280	6.43	41,348	5.20
65 to 74 years	329	7.56	48,907	6.15
75 to 84 years	166	3.81	27,697	3.48
85 years & older	73	1.68	11,181	1.41
Median age (yrs)			35.9	
18 years & older	3,368	77.35	597,098	75.09
Male	1,698	38.88	291,670	36.68
Female	1,675	38.47	305,428	38.41
21 years & older	3,220	73.95	563,649	70.88
Male	1,612	37.02	274,419	34.51
Female	1,608	36.93	289,230	36.37

Age Group	Buckley	Percent of city	Pierce County	Percent of County
62 years & older	738	16.95	111,411	14.01
Male	338	7.76	49,887	6.27
Female	400	9.19	61,524	7.74
65 years & older	568	13.05	87,785	11.04
Male	248	5.70	38,442	4.83
Female	320	7.35	49,343	6.2

Source: Bureau of the U.S. Census, 2010 Census.

Table 0.6 Average percentages and 2035 extrapolation for population segments.

	total	Averages	2010	2000	1990
Population:	7888		4,354	4,145	3,516
4 & younger	509.04	6.45	5.95	6.5	6.91
5 to 9	486.30	6.17	5.63	6.7	*
10 to 14	614.48	7.79	6.78	8.8	19
15 to 19	511.93	6.49	6.48	6.5	3.27
20 to 24	468.15	5.94	6.57	5.3	4.55
25 to 34	1,023.86	12.98	12.06	13.9	37.77
35 to 44	1,257.35	15.94	13.48	18.4	
45 to 54	1,124.30	14.25	15.65	16.1	11.01
55 to 59	457.24	5.80	7.92	5.2	4.27
60 to 64	340.24	4.31	6.43	3.5	3.01
65 to 74	489.58	6.21	7.56	5.2	5.86
75 to 84	276.34	3.50	3.81	3	3.7
85 & older	84.93	1.08	1.68	0.9	0.65
	7,888.**	96.90	100	100	100

* The greyed area shows the 1990 census categorizations that are different from the more recent census data and are not used to average the percentage population rates

** A .031 percent correction is required to make up for the 1990 figures

Chart 0.2 Mathematical calculation of population progression.

Rate:	Linear rate				Exponential rate			
	0.03000				0.02756			
year	F=P (1+r) ^t		Houses/ yr:	houses/ mo:	r = (F/P) ^{^(1/t)} - 1		houses/ yr	houses/ mo
2010	4,354	change			4,354	change		
2011	4,511	157	63	5	4,474	120	48	4.0
2012	4,669	157	63	5	4,597	123	49	4.1
2013	4,826	157	63	5	4,724	127	51	4.2
2014	4,983	157	63	5	4,854	130	52	4.3
2015	5,141	157	63	5	4,988	134	54	4.5

Rate: year	Linear rate				Exponential rate			
	0.03000				0.02756			
	$F=P(1+r)^t$		Houses/ yr:	houses/ mo:	$r = (F/P)^{(1/t)} - 1$		houses/ yr	houses/ mo
2016	5,298	157	63	5	5,126	137	55	4.6
2017	5,455	157	63	5	5,267	141	57	4.7
2018	5,612	157	63	5	5,412	145	58	4.8
2019	5,770	157	63	5	5,561	149	60	5.0
2020	5,927	157	63	5	5,714	153	61	5.1
2021	6,084	157	63	5	5,872	158	63	5.3
2022	6,242	157	63	5	6,034	162	65	5.4
2023	6,399	157	63	5	6,200	166	67	5.5
2024	6,556	157	63	5	6,371	171	68	5.7
2025	6,714	157	63	5	6,547	176	70	5.9
2026	6,871	157	63	5	6,727	180	72	6.0
2027	7,028	157	63	5	6,912	185	74	6.2
2028	7,185	157	63	5	7,103	191	76	6.4
2029	7,343	157	63	5	7,299	196	78	6.5
2030	7,500	75	30	3	7,500	201	80	6.7
2031	7,575	75	30	3	7,575	75	30	2.5
2032	7,650	75	30	3	7,651	76	30	2.5
2033	7,725	75	30	3	7,727	77	31	2.6
2034	7,800	75	30	3	7,805	77	31	2.6
2035	7,875	75	30	3	7,888	78	31	2.6

7. Comprehensive Plan Definitions & Acronyms.

Language used in the comprehensive plan should be consistent within itself and with the Buckley Municipal Code. Definitions within the city's code are preferred and will be used within this document.

Local roads	"Local roads" mean streets that primarily serve traffic destined to or originating from abutting land. The adjacent land is most often residential, but it may also be industrial or commercial.
Accessory dwelling unit	"Accessory dwelling unit" means a second dwelling unit incidental and subordinate to the principal dwelling which is located on the same lot or in the same building as the principal use.
Aesthetic	"Aesthetic" means a pleasing appearance or effect.
Amenity	"Amenity" means a pleasurable or aesthetic feature.
Annexation	"Annexation" means to incorporate land into an existing city. Washington State law prohibits annexation of unincorporated areas outside of Urban Growth Areas. Procedures for annexation can be found in Chapter 35.13 of the Revised Code of Washington.
Apartment	"Apartment" means a multi-family structure in which one or more of the dwelling units is not ground-related.
Arterial streets	"Arterial streets" mean streets that primarily move traffic between principal traffic generators. Residential access is discouraged, but commercial access is allowed.
Awning	"Awning" means a protective covering of fixed, non-collapsible, rigid construction, attached to a structure, the upper surface of which has a pitch of at least thirty (30) degrees from the horizontal.
Bike lane	A "bike lane" designates the shoulder of a road for exclusive use of bicycle travel.
Board of adjustment	The "Board of adjustment" is the body of City government which has the authority to grant variances and conditional use permits.
Bonds	"Bonds" mean certificates of debt issued by government which guarantee payment of the original investment plus interest by a specified future date.
Buffer	"Buffer" means a vegetated area established or managed to protect nontidal wetlands from human disturbances.
BYAC	"BYAC" means the Buckley Youth Activities Center.
Collector streets	"Collector streets" mean streets that serve internal traffic movements within an urban area by connecting local roads with the arterial system. They provide movement and access functions equally.
Comprehensive plan 18.12.020	"Comprehensive plan," means a generalized coordinated land use policy statement of the governing body of a county or city that is adopted pursuant to chapter 36.70A of the revised code of Washington. It consists of a map or maps, and descriptive text covering principles, goals, policies and standards used to develop the comprehensive plan. The plan is an internally consistent document and all elements are consistent with the future land use map. A comprehensive plan is adopted and amended with public participation as provided in RCW 36.70A.140.

Concurrent 12.100.020?	"Concurrent" means that facility and service improvements or strategies are in place at the time of development, or that a financial commitment is in place to complete the improvements within six years.
Connectivity	"Connectivity" implies a system of streets with multiple routes and connections serving the same origins and destinations. Connectivity not only relates to the number of intersections along a segment of street, but also to how an entire area is connected by the system. An area with high connectivity has multiple points of access around its perimeter as well as a dense system of parallel routes and cross-connections within the area, forming a grid-like hierarchy of arterials, collectors and local streets.
Conservation	"Conservation" means the careful management and maintenance of natural resources through prevention of loss, damage or neglect.
Contiguous	"Contiguous" means bordering upon, to touch upon, or to be in physical contact with.
County wide planning policies	"County-wide planning policies" are written policy statements used solely for establishing a county-wide framework from which county and city comprehensive plans are developed and adopted. The framework ensures that city and county comprehensive plans are consistent as required in RCW 36.70A.100.
Cul-de-sac	"Cul-de-sac" means a street closed at one end by a widened pavement of sufficient size for automotive vehicles to be turned around.
Curb bulb	A "curb bulb" is an alignment of the curb line that extends out toward the traffic lanes. Typically, it consumes the same width as a parking lane. It is done for the purpose of traffic calming and to produce a shorter distance for pedestrians to walk across lanes of traffic.
Curb cut	A "curb cut" is a technical term for a driveway to one or more individual developments.
Density	"Density" means a measure of the intensity of permitted residential development in terms of dwelling units per acre.
Density bonuses	"Density bonuses" refer to an incentive given to a developer for providing a desired public good. For example, a developer may be allowed to develop at a higher density than allowed in a particular zone if a certain percentage of the units built meet the definition of affordable housing.
Design guidelines	"Design guidelines" refer to neighborhood, site, and building guidelines which layout specifications to maintain and strengthen community character and identity. In addition to traditional standards the guidelines include specifications for doors, windows, roofing, ornament, awnings, color, facades, scale, form and street amenities.
Detached	"Detached building" means a building surrounded on all sides by open space.

Development regulations	"Development regulations" mean the controls placed on development or land use activities by a county or city, including, but not limited to, zoning ordinances, critical areas ordinances, shoreline master programs, subdivision ordinances, and binding site plan ordinances together with any amendments thereto.
Environmental Impact Statement	An "Environmental Impact Statement" (EIS) is required under the State's Environmental Protection Act (SEPA) when it is determined that a project will result in a significant adverse impact to the environment that cannot be avoided or reduced by mitigation to a level deemed insignificant. The EIS documents alternatives to the proposed action with extensive evaluation of the advantages and disadvantages of each alternative.
Façade	"Façade" means any exterior wall of a structure including projections from and attachments to the wall. Projections and attachments include balconies, decks, porches, chimneys, unenclosed corridors and similar projections.
Floor Area Ratio	"Floor area ratio" (FAR) means a ratio expressing the relationship between the amount of gross floor area permitted in a structure and the area of the lot on which the structure is located.
Comprehensive Plan Map	The "comprehensive plan map" is part of the comprehensive plan that defines the location different land uses specified in the plan.
Urban Growth Area	A "Urban Growth Area" specifies areas proposed to be included within the City's urban growth area at a future date.
Gateway	"Gateways" mark the points where roads or paths cross a boundary and help reinforce the distinctness of any part of a city.
Goal	A "goal" means a broad, long-range purpose toward which policy decisions and action are directed.
Grants	"Grants" refer to funds awarded by state and federal government for the purpose of accomplishing a defined public purpose.
Grid street system	A "grid street system" has multiple points of access around its perimeter as well as a dense system of parallel routes and cross-connections within the area, forming a hierarchy of arterials, collectors and local streets. Parallel routes, typically, are classified and sized appropriately for local traffic to discourage infiltration of longer distance through traffic. The purpose of such a redundant street system is to provide choices for drivers wishing to travel short distances completely within the area, and from within the area to points outside of the area, without being forced to travel on an arterial. An example of the traditional grid pattern is seen in downtown Buckley. Grid street patterns result in dispersion of traffic throughout the system and provide multiple direct local street connections for pedestrians and bicyclists. While arterials exist within the grid pattern, local traffic use interconnected local streets freeing the arterials for the movement of longer distance travelers.
Gross acre	"Gross acre" refers to the area covered by both lots and public rights-of-way in combination. Technically gross parcel acreage means acreage plus one half the width of abutting rights-of-way of streets and alleys. See net acre for comparison.

Gross density	"Gross density" means the total number of dwelling units divided by the total land area of the site, excluding nothing.
Growth Management Act	The "Growth Management Act" (GMA) is the legislative act enacted by the Washington State legislature in 1990 and codified in RCW 36.70A. It requires certain counties and cities in the State to perform detailed and coordinated planning efforts to deal with rapid population growth and concerns with suburban sprawl, environmental protection, quality of life and related issues.
Growth Management Hearings Board	The "Growth Management Hearings Board" (GMHB) is the body of government that hears petitions and makes determinations regarding whether a state agency, county, or city is, or is not, in compliance with the requirements of the Growth Management Act. They also hear appeals and determine whether the twenty-year growth management planning population projections adopted by the office of financial management are correct or should be adjusted.
Habitat	"Habitat" for a particular plant or animal consists of the elements it needs to survive. These elements may be tied to temperature, water, soil, sunlight, source of food, refuge from predators, place to reproduce, and other living and non-living factors.
IAC	"IAC" means the Interagency Committee for Outdoor Recreation, the Washington State agency that administers most state and federal recreation-oriented grant programs.
Infrastructure	"Infrastructure" means the physical underlying foundation or framework of a city, such as streets and utilities.
Interior lot	"Interior lot" means a lot other than a corner lot with only one frontage on a street.
Kiosk	A small open structure set up in a public place where one can obtain information.
Land Use	"Land Use" means the nature of the occupancy, the type of activity, or the character and form of improvements to which land is devoted or may be devoted.
Level of service standards	"LOS or Level of Service" means the standard used in determining the number facilities that should be in a city; usually a ratio of the number of facilities to the number of people for that facility.
Loading space	"Loading space" means an off-street space or berth on the same lot with a building, for the temporary parking of a commercial vehicle while loading or unloading merchandise or materials.
Local community park	"Local (community) park and recreation facilities" means park facilities that serve a population within one mile radius.
Low income household	"Low income household" means any household whose total household income is less than fifty (50) percent of the median income for comparably sized households in the Tacoma Primary Metropolitan Statistical Area as defined by the United States Department of Housing and Urban Development.

Low income housing	"Low income housing" means any housing unit which is rented to a low income household at rents not to exceed thirty (30) percent of fifty (50) percent of the median income for comparably sized households in the Tacoma Primary Metropolitan Statistical Area as defined by the United States Department of Housing and Urban Development.
Low-moderate income housing	"Low-moderate income housing" means any housing unit which is rented to a low-moderate income household at rents not to exceed thirty (30) percent of eighty (80) percent of the median income for comparably sized households in the Seattle-Everett Standard Tacoma Primary Metropolitan Statistical Area as defined by the United States Department of Housing and Urban Development.
Median, raised	A "raised median" is the center portion of a street that is raised and surrounded by a six-inch curb. It is planted with at least grass or ground cover and often trees and seasonal color. It could also contain pedestrian crossing areas at mid-block locations.
Mini-park	"Mini-parks" refer to specialized facilities that serve a concentrated or limited population or specific group such as children or senior citizens. Their service area is less than 1/4 mile. A desirable size is a one acre or less, and one quarter to one half . acre per 1,000 population is the standard set by the NRPA.
Minor arterial	"Minor arterials" mean streets that serve travel to smaller geographic areas than those served by the principal arterial system. Examples of traffic generators served by minor arterials include high schools, junior high schools, community business centers, neighborhood shopping centers, large hospitals, athletic fields, and major parks or recreation facilities.
Mixed use	"Mixed use" means zones or buildings that contain more than one land use within them. Mixed use zones may contain a horizontal mix of uses with different land uses existing side by side on distinct lots, or they may contain a vertical mix of uses with different land uses existing on the same lot within one structure one on top of the other. Traditional urban development patterns offer many examples of mixed use buildings where residential apartments exist above commercial retail stores.
Multi-modal	"Multi-modal" refers to two or more modes of transportation having access to streets or lots.
Net acre	"Net acre" refers to the buildable acreage of a lot. Areas devoted to rights-of-way and critical lands are subtracted from gross acreage to determine the net acreage that can be built upon the site. (See "gross acre" for comparison.)
NRPA or National Recreation and Park Association	"NRPA or National Recreation and Park Association" means the leading advocacy organization dedicated to the advancement of public parks, recreation and conservation.
NRPA Standards	"NRPA Standards" National Recreation and Park Association minimum acceptable spatial allocation measures for different types of recreational facilities.

Objective	"Objective" means a specific purpose, product or performance level - an achievement. Several objectives can be proposed toward achieving a goal.
Office of Financial Management (OFM)	The "Office of Financial Management" (OFM) is the State agency responsible for (among other things) developing population forecasts for cities and counties as required by the State's Growth Management Act.
Open space	"Open space" means a portion of land which has not been developed and which is designated for preservation in its natural state, for outdoor recreation, for wildlife habitat, or for similar uses, or which is designated for minimizing potential hazards.
Overlay zone	"Overlay zone" means a special zoning designation which combines with the underlying land use classification and adds specific guidelines or restrictions.
Park	"Park" means an open space use in which an area is permanently dedicated to recreational, aesthetic, educational or cultural use and generally is characterized by its natural and landscape features. A park may be used for both passive and active forms of recreation; however, its distinctive feature is the opportunity offered for passive recreation such as walking, sitting and watching.
Park system	"Park system" means the combined facilities and properties in the city that are dedicated to park, open space and recreational purposes.
Parking, off-street	"Off-street parking" means any space, specifically allotted to the parking of motor vehicles not located in a dedicated right-of-way, a travel lane, a service drive, nor any easement for public ingress or egress so as to block access.
Permitted use	"Permitted use" means any land use authorized in a specific zone and subject to the limitations of the regulation of such zone.
Planned unit development	"Planned Unit Development" (PUD) means a zoning mechanism which allows for flexibility in the grouping, placement, size and use of structures on a fairly large tract of land. A PUD is developed as a single entity, using a public process which incorporates design review.
Planting strip	A "planting strip" is a continuous or intermittent strip of land located between the curb and the sidewalk, so that visual separation between pedestrians and vehicles is provided.
Plat	"Plat" means a map or representation of a subdivision showing the division of a tract or parcel of land into lots, blocks, streets and alleys or other divisions and dedications.
Policy	A "policy" is a definite course or method of action, which guides and determines present and future decision-making.
Preservation	"Preservation" means to keep in perfect or unaltered condition; maintain unchanged or intact.
Principal arterial	"Principle arterials" primarily function to expedite through traffic between major traffic generators. Traffic generators include central business districts, regional shopping centers, cities, freeways and lower arterial systems.

Priority species	"Priority species" are species that require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority species include State Endangered, Threatened, Sensitive, and Candidate species; animal aggregations considered vulnerable; and those species of recreational, commercial, or tribal importance that are vulnerable.
Public benefit features	"Public benefit features" mean amenities, uses, and other features of benefit to the public, which are provided by a developer and which sometimes qualify for an increases in density. Examples include public open space, pedestrian improvements, housing, and provision of human services.
Public services	"Public services" include fire protection and suppression, law enforcement, public health, education, recreation, environmental protection, and other governmental services.
Resource lands	"Resource lands" are lands primarily devoted to the commercial production of agricultural, timber, or mineral products.
Restoration	"Restoration" means a human activity that returns a wetland or former wetland from a disturbed or altered condition with lesser acreage or functions to a previous condition with greater wetland acreage or functions.
Right-of-way	"Right-of-way" means the land held by the public for road and utility purposes. It usually refers to the land required for the traffic lanes plus the shoulders and drainage structures on both sides of highways, roadways, bikeways and alleys.
Riparian corridors	"Riparian corridors" include land located on the banks of rivers and streams that supports riparian vegetation and wildlife and performs important watershed functions.
Row house	"Row house" means one of a row of identical houses situated side by side and sharing common walls
Rural	"Rural" means sparsely settled or agricultural land.
Screening	"Screening" means effectively obscuring the view of unsightly uses from the public right-of-way or private lots.
Shall, will, must	When a goal, objective or policy states that the City "shall" or "will" do something, such language requires that the City take measurable steps to accomplish the purpose of the original policy.
Should, may, encourage	When a goal, objective or policy states that the City "should", "may", or "encourage" to do something, such language requires that the City make an effort to accomplish the purpose of the original policy.
Through lot	"Through lot" means a lot other than a corner lot with frontage on more than one street. Through lots abutting two streets may be referred to as double frontage lots.
Townhouse	"Townhouse" means a type of attached multifamily dwelling in a row of at least three in which each unit has its own front and rear access to the outside, no unit is located over another unit, and each unit is separated from any other unit by one or more vertical common fire-resistant walls.

Transit-oriented development	"Transit oriented development" means moderate to higher density development, located within an easy walk of a major transit stop, generally with a mix of residential, employment, and shopping opportunities designed for pedestrians without excluding the auto.
Urban design	"Urban design" is architecture at the city scale; it considers the way buildings, streets, and the spaces between them relate to one another with the goal of creating vibrant, welcoming urban environments.
Urban forest	"Urban forest" refers to land in urban areas that is managed for its production or for preservation of its forest characteristic.
Urban growth	"Urban growth" refers to growth that makes intensive use of land for the location of buildings, structures, and impermeable surfaces to such a degree as to be incompatible with the primary use of land for the production of food, other agricultural products, or fiber, or the extraction of mineral resources, rural uses, rural development, and natural resource lands designated pursuant to RCW 36.70A.170.
Urban growth area	"Urban growth areas" (UGAs) are those areas designated by a county in which urban growth is directed. "Urban growth should be located first in areas already characterized by urban growth that have adequate existing public facility and service capacities to serve such development, second in areas already characterized by urban growth that will be served adequately by a combination of both existing public facilities and services and any additional needed public facilities and services that are provided by either public or private sources, and third in the remaining portions of the urban growth areas." RCW 36.70A.110
Way-finding	"Way-finding" means a coordinated system of off-premises directional signs incorporating general public information.
Wildlife habitat	"Wildlife habitat" means the specific areas or environments in which a particular type of plant or animal lives. An organism's primary and secondary habitat provides all the basic requirements for life of the organism.
Wildlife (habitat) corridor	"Wildlife (habitat) corridor" means the linear wildlife habitat area that allows for free movement of species through a geographic area.
Zero lot line	"Zero lot line" means the positioning of a structure on a lot so that one side rests directly on the lot's boundary line.
Zoning map	"Zoning map" means the map which illustrates the boundary lines of the particular zones within the City.
Zoning ordinance	The "zoning ordinance" is that body of law which regulates the structure and use of buildings. Within each zone different development standards are applied to protect the health, safety and welfare of the community.



View from Spiketon Road

1 Land Use

Introduction.

The term “land use” refers to the type of activities occurring on land. Generally, this refers to the plan for orderly and coordinated land development and uses for buildings and land within the city. Specifically under the Growth Management Act (GMA) this meaning is more detailed:

The land use element designates the general distribution and general location and extent of all land uses, including housing, commerce, industry, recreation, open spaces, public utilities, public facilities, and other land uses. The land use element shall include population densities, building intensities, and estimates of future population growth.

The land use element shall provide for protection of the quality and quantity of groundwater used for public water supplies.

Wherever possible, the land use element should consider using urban planning approaches that promote physical activity.



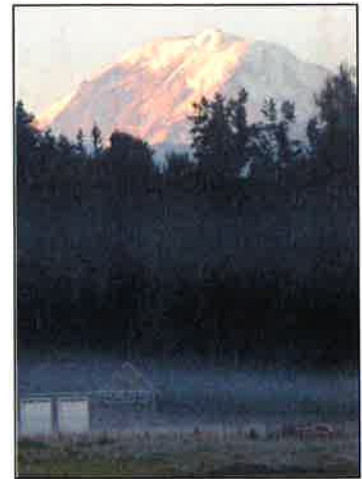
Where applicable, the land use element shall review drainage, flooding, and storm water run-off in the area and nearby jurisdictions and provide guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state, including Puget Sound or waters entering Puget Sound.



In this city distributing and locating uses is done through zoning. The city’s comprehensive plan separates uses generally from industrial and general commercial (I&GC, the city’s most intensive commercial activities), commercial and mixed use (C&MU, less intense commercial and commercial/residential

mixtures), high density (HDR, apartments and highest density dwellings), and lower density (LDR, mostly single family homes).

From these general land use designations, the city's zoning has two zones for I & GC, light industrial (LI), and general commercial (GC); C & MU has four zones, GC, historic commercial (HC), central commercial (CC), and neighborhood mixed use (NMU). NMU serves as the city's buffer zone between residential and commercial zones. The city has one high density residential zone (HDR) that fits into the designation of UHD; and for ULD, the city has two residential zones that allow lower-density multifamily development (R-6,000 and R-8,000), and one single family zone, R-20,000. An accessory dwelling unit (ADU) is allowed on any single-family residential lot within the residential zones and two of the mixed-use zones.



Distribution of the zones is partly based on city history, city vision, and utility. Some sites within the city are zoned because of their histories as an active industrial site that began before zoning was effected. The city desires to buffer commercial zones with a commercial/residential zone and radiate density outward from the HC district. Sewer is becoming available in all areas of the city, but the areas of lowest residential density contain residents that want to keep the wildlife that currently visits them, distances between neighbors, and the quality of life they find in this environment.

Distribution of zones is one aspect of land use, uses within the specific zones is the other aspect of land use. It is important for uses to complement one another, for example not have a shopping mall adjacent to a single family community, or an industrial use that includes noise next to a spa. The idea is to group complementary uses together so they can support, or at the very least not antagonize, one another.

In the 2005 comprehensive plan the city recognized the need to integrate some uses and created implementing regulations in the zoning code. The ordinances:

- a. Created a buffer zone (NMU) that is physically integrated with appropriate commercial and residential uses, such as single family residences and lower-intensity retail stores.
- b. Expanded low-density multifamily development within the higher-density residential zones of R-6,000 and R-8,000, and allowed duplexes, triplexes, and multiplexes within these zones.





These ideas work well and will be continued through this update. Expanding multifamily uses within R-6,000 and R-8,000 zones follows the GMA directive to encourage diverse ranges of housing types, while retaining Buckley's small-town character.

The "small-town" character was discussed by the planning commission while preparing this update. Pulling from the 2005 plan as well as experiences living in the community for a number of years, "small town" was interpreted to mean being able to walk from one place to another, meet with other residents in safe environs, and be socially aware of the other city citizens.

Two zones are left in the zoning map: the public (P) zone and the sensitive (S) zone. Public zones are placed where public need and public properties are located, such as city hall, public parks, public schools, and public services. The S zone is generally placed between the river and the city's uplands and shares uses that area available through the Shoreline Management Program.

Population growth is discussed in the general introduction to the comprehensive plan because the population discussion is used in several elements of this plan. The next section, Current Conditions, will elaborate on this topic.

This update will expand on the existing plan's work, which includes the following topics:

**FO
E1 General land use.** Under the Washington State Growth Management Act, Buckley must provide for population growth in a 20-year time span. Buckley must encourage commercial development and a diverse range of housing types to address the changing needs of its population, while also maintaining Buckley's small town character.



**FO
E1 Resource protection.** The area adjacent to the White River sustains healthy populations of fish, mammals, birds, insects, reptile, amphibians and plant life. This genetic and biological diversity, or biodiversity, should be protected. It is important to consider long-term ecosystem health and work to maintain adequate habitat and ensure the continued viability of a diversity of species to ensure the waterfront is available for our children. The land use element is the only element in the comprehensive plan that discusses critical areas, storm water, and pollution controls. The city's only flood plains are next to the river; the steepest slopes are on the north side between the residential areas and the river; the city's Shoreline Management Program allows no residential or commercial development.

**FO
E1 Intergovernmental coordination.** Several elements discuss intergovernmental coordination for planning resources and finding funds for needed facilities.

**FO
E1 Residential land use.** Preserving Buckley's rural character includes maintaining open spaces and view corridors to help encourage an outdoor aesthetic and participation in a natural environment. Encouraging clustering of development allows maintenance of open space and helps protect sensitive areas.



FO 81 Commercial land use. Commercial uses in Buckley should enhance the quality of life for residents by providing needed services, employment, and tax revenues to finance public services. The “mix” of commercial services refers to both physical integration (among commercial and residential uses) and composition (type) of commercial establishments. Commercial and residential uses should be physically integrated with one another along the northeast SR 410 corridor, through adequate motorized and non-motorized transportation connections.

FO 81 Transportation (also addressed in Element 5). Land use and transportation policies address the relationship between the land use pattern and a multimodal transportation system. Separation of different land uses results in longer trips. When jobs, shops and services are long distances from residential areas, this translates into additional vehicle or transit trips. Allowing residential and nonresidential uses to locate in closer proximity to one another would provide transportation options by making walking or bicycling more feasible.

FW 81 Parks, recreation, and open space (also addressed in Element 6). As development pressures increase, stress levels will likely increase. A curative for stress is relaxation, whether by strenuous activity that may come with sports, or more passive activity that may come from slow walks on a pleasant trail watching nature.

FW 81 Public facilities and utilities (also addressed in Elements 7 and 8). Public facilities and utilities maintain the quality of life for existing and future development by establishing and maintaining level of service standards. The size and location of public facilities and utilities influence the pattern of land development; therefore, provision must be consistent with the policies described in all sections of the comprehensive plan. The State Growth Management Act requires local government comprehensive plans to include a process for identifying and siting essential public facilities, which are public or quasi-public facilities, such as airports, state educational facilities, state and local correctional facilities, solid waste handling facilities, mental health facilities, and group homes. The State Office of Financial Management is required to maintain a list of essential state public facilities that are required or likely to be built within the next six years. No local comprehensive plan or development regulation may preclude the siting of essential public facilities.



Current Conditions.

Since the 2005 comprehensive plan was adopted, the city built a youth center, constructed a skate park, closed the jail, built a fire hall, redirected traffic along 112th Street to Ryan Road, purchased land adjacent to White River, leased land from Washington State Department of Social & Health Services (DSHS), approved subdivisions, rezoned properties, and is in the

process of redirecting traffic from SR 410 to SR 165. (For details on the subdivisions, please see the population section in the general introduction.)

Zoning and other land use laws attempt to spatially structure the use of land in ways to protect and enhance the public's health, safety and welfare. This traditional method averts conflicts between land owners by segregating different development types and allows similar development characteristics within each area. Development of the buffering district in the 2005 comprehensive plan was an effort to further avert conflicts between differing uses. The NMU zone, however, is not currently positioned to separate all commercial zones from residential zones. This zoning map update should be expanded to adequately buffer residences from commercial uses. In 2014, land between the central commercial (CC) zone and the residential zone R-6,000 was rezoned to neighborhood mixed use (NMU), to better buffer between the two zones.

Site design standards also impact the ability of drivers, pedestrians, and bicyclists to get around. Policies in this section discuss the importance of considering connections and alternative transportation modes when planning new development. The special needs of industrial development are also addressed.

General land use.

Buckley is adjacent to three highways, SR 410 bisects the city and runs from the west city limit line to the northeast city limits; SR 165 runs south toward Wilkeson, South Prairie, and Orting; and the Buckley-Sumner Highway runs along the northwest part of the city to Bonney Lake. SR



410 is the main highway through town and runs in two directions: west to east until it reaches SR 165 at which point it turns and runs to the northeast. SR 410 has commercially-zoned properties on either side, except for park areas in which Tacoma Water has an easement for a 52-inch water line.

The Foothills Trail is dubbed locally as “the new Main Street” because it serves as a major thoroughfare for pedestrians and bicycle traffic. It is a place where the community gathers for events and for recreation, and is considered a center of local importance.

Resource protection.

Currently, critically areas are mainly next to the river, between the river and the city's residential high ground. Because of the city's geologic underlayer of clay, is possible for lands to appear wet without being wetlands. Wetlands must have three specific characteristics: soil, hydrology, and vegetation. Certain areas of the city have hydrology and vegetation, but not the right soil.

Slopes are in the south and north portions of the city; the south goes up to Spiketon Hill and the north goes down to the river. Floodplains occur only on the north area next to the river. The current Federal Emergency Management Act (FEMA) map, floodways are not apparent, although on newer Pierce County maps, floodways do appear. Floodways are to be treated as if they are shorelines.

Intergovernmental coordination.

The Growth Management Act requires governments coordinate, particularly for lands between or adjacent to other jurisdictions. In Buckley, the only adjacent jurisdiction is Pierce County. Buckley regularly participates in regional committees.

Residential.

Buckley is primarily a residential community with neighborhoods surrounding an historic commercial downtown and commercial and multifamily uses along the northeast SR 410 corridor. The bulk of housing is east of SR 410 in single family homes. Multifamily, senior housing, and low income housing are located in Buckley.



Buckley contains a population of about 4,370 people. In the 2010 census, the city's population consisted of about 7 percent children under 5 years old, about 17 percent were between 5 and 17 years old, and 13 percent were 65 years old and older. The city had 1,591 occupied households, and 79 unoccupied houses. According to the 2010 census race is mostly white with ages ranging for the majority of citizens between 25 and 54 years old.

Certain established single family neighborhoods are currently designated under the comprehensive plan and the zoning map as higher intensity and should be re-designated and rezoned to fit the current use.

Currently, Neighborhood Mixed Use zones (NMU) are located between Light Industrial zones and General Commercial zones (GC) and should be removed because residential uses between light industrial uses are inconsistent with one another.

Commercial.

Commercial uses generally run along State Route 410. During a rezone application at 203 Pearl St., the city noticed uses on that street don't necessarily meet the zone in which the property is located; single family structures are zoned HC and commercial uses are zoned R-6,000. The buffer zone of NMU would allow the current uses to continue without being nonconforming uses and/or structures.

The few parcels zoned for industrial use are mainly found along SR410 and 112th Street.

Transportation.

Getting from *here* to *there* is important to each citizen. Although currently Buckley is not part of the transit line, the city assumes it will be in the future. Funding for transportation improvements, such as the improvements at SR 410 to SR 165 were enabled in part through transportation grants. This update reviewed and revised the sidewalk plan, the future street plan, and the trail plan.

Parks, recreation, and open space.

Recreational areas and programs are important to the community to provide places to relieve stress, socialize, recreate, and come together as a community to celebrate certain events. As mentioned before, since the 2005 comprehensive plan, the city built the youth center and skate park, which adds to the city's ability to serve a large portion of its citizens.

Further development will include a spray park.

**Public facilities and utilities.**

All people need water, sewage disposal, electricity, natural gas, schools, police, fire, and storm water controls. These public facilities aid each citizen to live comfortably and safely.

The Growth Management Act states cities are to provide public utilities to its citizens. Buckley provides water, but until relatively recently, sewage disposal was not available to newcomers. The new sewer plant is capable of expansion when it is needed. The city recently sold its gas utility to Puget Sound Energy.

Strategy.

Strategy is the systematic method of attaining goals. The basic strategy in this plan is to identify what the city residents want for its city, which is assumed to be the same as in the original 2005 comprehensive plan, identify current shortfalls as compared to those goals, and establish policies to meet the goals within this planning document's timeline.

In land use, the current strategy is to buffer residential from commercial uses, provide for the future population growth by maintaining the variability of house types within residential zones, and update design standards for all commercial uses adjacent to SR 410. For the area between SR 410 and River Avenue south of Main Street, a design center is to be created as an overlay to allow the city to revise its binding site plan, rezone certain lands to Public for continued open space, and plan the style of buildings on the area between the Foothills Trail and River Avenue.

The strategy also includes bringing people to the historic commercial center by developing links from the Foothills Trail to the museum and to downtown, and from the development between the trail and River Avenue south of Main Street to the downtown.

Goals & Policies.**General Land Use****Goal 1.1**

Buckley should provide a healthy and productive environment for its citizens and preserve its small town character.

Policy 1.1.1

Buckley should preserve its small town character through the following:

1. Concentrate retail development near the historic downtown center of the city and near the SR 410 corridor.
2. Integrate additional density in the residential zones in a manner that protects the single family areas from commercial encroachment.
3. Focus commercial development outward from the existing commercial zones.
4. Focus pedestrian and bicycling trails and sidewalks between commercial and residential developments to encourage non-motorized access.
5. Encourage mixed use developments in commercial zones.

Policy 1.1.2

The city should formally designate the area between Ryan and Park, and between SR 410 and River the city's center of local importance (CoLI).

Policy 1.1.3

With all new development and redevelopment, the city should carefully consider the way buildings, streets, and the spaces between them relate to one another, and strive to create a vibrant, welcoming urban environment.

Policy 1.1.4

The city should identify lands useful for public purposes, such as utility corridors, transportation corridors, landfills, sewage treatment facilities, stormwater management facilities, recreation, schools, and other public uses.

Policy 1.1.5

The city should identify open space corridors within and between urban growth areas, including lands useful for recreation, wildlife habitat, trails, and connection of critical areas.

Resource protection.**Goal 1.2**

The city should carefully consider critical areas and their buffers before areas are designated for development. Development potential should be preserved by allowing smaller lots in the non-critical areas to reduce the loss of density. If preservation is not possible, development should protect the critical areas and augment or replace the area before construction is permitted.

**Policy 1.2.1**

Develop approaches that allow clustered development to:

1. Preserve sensitive (critical) natural features and to provide flexibility to the property owner;
2. Maintain view opportunities; and
3. Preserve contiguous portions of development sites in permanent open space.

**Policy 1.2.2**

Identify and preserve an integrated system of open space corridors and/or buffers to provide definition between critical areas and intensive land uses through cooperation with groups such as land trusts or environmental protection organizations.

Policy 1.2.3

Identify and conserve critical wildlife habitat including nesting sites, foraging areas, and migration corridors within or adjacent to critical areas, open spaces, and intensively developed land to capture resource tourism, such as birding.

Policy 1.2.4

Site development regulations should be reviewed to ensure that they reduce erosion, promote immediate re-vegetation, and reduce the amount of sediment leaving a construction site to protect waterways and other properties.

Goal 1.3

Protect, preserve and enhance endangered fish and wildlife habitat.

Policy 1.3.1

Protect and restore biodiversity and of supporting habitats in order to enjoy the benefits of important ecosystem services

Policy 1.3.2

Identify and protect wildlife corridors before and during land development by using development restrictions, public education, and incentives.

Policy 1.3.3

Protect native plant communities by encouraging management and control of nonnative exotic and invasive species, including both terrestrial and aquatic plants.

Policy 1.3.4

Areas containing critical areas, including wetlands, fish and wildlife habitat protection areas, frequently flooded areas, critical aquifer recharge areas, and geologically hazardous areas, are to be protected from development. The best available science (BAS) is to be used to protect the functions and values of these areas and special consideration should be given for conservation or protection measures necessary to preserve or enhance anadromous fisheries.

Policy 1.3.5

The city acknowledges that for shorelines of the state, the goals and policies of the shoreline management act and the city's Shoreline Management Program are added as goals of this chapter. The goals and policies of the shoreline master program shall be considered an element of the comprehensive plan.

Intergovernmental coordination.

Goal 1.4

Coordinate with Pierce County and neighboring jurisdictions to create opportunities for mutual improvements.

Policy 1.4.1

The city councils and planning commissions of Buckley and its neighboring jurisdictions should conduct annual meetings to discuss growth directions and development on the plateau, to exchange information, to review common issues, to establish ad hoc working committees for resolution of any issues, and to serve as an education tool for the public.

Policy 1.4.2

The cities of Buckley and Bonney Lake should establish a joint planning area that allows city input in the development review process for areas located between the two city jurisdictions.

Policy 1.4.3

The city should continue working with DSHS to increase the uses on the leased properties.

Policy 1.4.4

The city should establish or update an annexation policy to address immediate and long term plans for growth that creates logical boundaries and reasonable service areas on land that can physically accommodate development.

Policy 1.4.5

The city should work with the Pierce County Biodiversity Alliance to help develop the stewardship plan for the Lower White River Stewardship Plan.

Policy 1.4.6

The city should work with private or nonprofit organizations that aid low- and moderate-income families.

Policy 1.4.7

The city should support acquisition and creation of affordable housing by private or nonprofit organizations or other social and health service agencies for low and moderate-income tenants.

Policy 1.4.8

The city should work with the Mt. Rainier National Park Commission to research infrastructure improvements and media accessibility to transform the city into an active Carbon River Corridor, Sunrise, and the Chinook Pass gateway destination.

Policy 1.4.9

The city should continue working with Pierce County, King County, and other agencies to complete the Foothills Trail to Enumclaw, South Prairie, Wilkeson, Carbonado, and Fairfax.



Policy 1.4.10

Work with WSDOT, Pierce County, Washington State Park and Recreation Commission and other appropriate parties to link and extend the foothills trail east over the river to Enumclaw.

Policy 1.4.11

The city should continue joint use agreements with the school district to maximize the availability of facilities for recreational and other public uses.

Policy 1.4.12

The city should continue work with neighboring communities to identify and implement measures designed to enhance tourism, recreational development and economic development through exploring and sharing historic knowledge and information about our common heritage.

Residential land use (Also addressed in Element 2).**Goal 1.5**

Housing types should be mixed and meet the needs of all segments of the population.

Policy 1.5.1

Lot sizes should be able to be reduced in subdivisions that contain critical areas.

Policy 1.5.2

Development in the city should promote livability through the following:

1. Developers should provide connections to pedestrian trails and/or sidewalks;
2. Development should be designed in such a way to recognize the city's history or design standards; and
3. Development should limit stress factors such as noise, traffic, and damage to existing ecology.

**Policy 1.5.3**

The city should consider creating regulations for planned unit developments, transfer of development rights, and written permitting procedures.

Policy 1.5.4

Zoning regulations and associated maps should provide adequate land and densities to accommodate housing targets while protecting and enhancing the character, quality, and function of existing residential neighborhoods.

**Policy 1.5.5**

Flexibility in development regulations should be provided to allow for clustered housing developments. This could be through planned unit developments, clustered housing developments, cottage housing, or adding flexible lot sizes in the subdivision regulations.

Policy 1.5.6

Density bonuses should be considered for residential developments that, in addition to meeting minimum building requirements, affordability design initiatives are used as a specified community objective of that residential development. Specific criteria for evaluating application for a density bonus should be identified and developed by the planning commission and city council.

Policy 1.5.7

Encourage more efficient use of the land where services exist, through such devices as flexible lot sizes and reduced setbacks through a planned unit development.

Policy 1.5.8

Permit accessory living units in all residential zones.

Policy 1.5.9

Allow residential-based businesses that are compatible with other residential uses.

Policy 1.5.10

The city should encourage development of affordable housing.

Policy 1.5.11

Prevent incompatible land uses through zoning and code enforcement.

**Policy 1.5.12**

Ensure adequate residential land supply is zoned appropriately to support residential uses.

The city should consider creating regulations for planned unit developments, transfer of development rights, and written permitting procedures.

Policy 1.5.13

Zoning regulations and associated maps should provide adequate land and densities to accommodate housing targets while protecting and enhancing the character, quality, and function of existing residential neighborhoods.

Commercial land use (Also addressed in Element 3).

Goal 1.6

The city should have different commercial uses to support the various needs of the Buckley community, increase the city's tax base, and support the city's small town character.

Policy 1.6.1

Ensure adequate commercial land supply is zoned appropriately to support commercial uses.

Policy 1.6.2

Encourage motorized and non-motorized connections between adjoining retail developments to create links to transportation. Also encourage links between retail, residential and civic uses. The city should consider establishing links through easements, impact fees, and development code.

Policy 1.6.3

Encourage mixed use development where appropriate, especially in and around Buckley's historic center.

Policy 1.6.4

Plazas and open space should be provided to link trails with commercial areas.

Transportation (also addressed in Element 5).**Goal 1.7**

Have transportation systems enhance the appearance, quality, and function of residential and commercial districts, provide connectivity between adjacent developments and ensure safe and easy multi-modal access to goods and services.

**Policy 1.7.1**

The city should require vehicular and non-motorized connections between adjacent developments through dedications of land and easements.

Policy 1.7.2

The city may require additional land for improvements to roadways, pedestrian walkways, trails, and access to open space areas.

Policy 1.7.3

The city should encourage walking and bicycling to work and shopping through educational programs.

Policy 1.7.4

The city should encourage easy access to highways for industrial development by zoning industrial areas close to highways. This will also help to discourage industrial traffic through residential areas.

Policy 1.7.5

Intense commercial and residential development should be located on principal and minor arterials.

Parks, recreation, and open space
(also addressed in Element 6).

Goal 1.8

Have a well-maintained, interconnected system of multi-functional parks, recreational facilities and open spaces that is attractive, safe, and available to all segments of the city's population; and supports the community's established neighborhoods and small-town atmosphere.



Policy 1.8.2

Coordinate park activities with economic development activities to develop a coherent plan that links parks and trails to economic development.

Policy 1.8.3

The city should acquire sufficient land to provide the following three types of parks:

1. Mini-parks within about a quarter mile of residential areas of about 2,500 square feet each at a rate of .5 acres for each 1,000 population
2. Neighborhood parks within a quarter to half mile of residential areas of up to 10 acres in size at a rate of one acre for each 1,000 population.
3. Community parks within three miles of residential areas that contain up to 50 acres in size at a rate of five acres for each 1,000 population.

Policy 1.8.4

Any residential development containing more than four dwelling units shall provide recreational facilities or appropriate and usable park land on or near the development.

Policy 1.8.5

The city should provide development incentives such as density bonuses, purchasable development rights, transferable development rights to assist in preserving permanent open spaces.

Policy 1.8.6

Connect parks, schools, recreation areas, and open spaces through trails and sidewalks.

Policy 1.8.7

New development shall provide community paths and trails that link the new development to existing trails and paths.

Policy 1.8.8

Regularly update the park plan to ensure grants and other external funding sources or interagency cooperative arrangements are available to the city.

Public facilities and utilities (also addressed in Elements 7 and 8).

Goal 1.9

Coordinate an orderly provision of public facilities with public and private development activities that complements the fiscal resources of the city.

Policy 1.9.1

Public facilities and utilities should be located in the following priority:

1. Maximize the efficiency of services provided;
2. Minimize the cost of services; and
3. Minimize impacts on the natural environment.

Policy 1.9.2

Zoning densities should recognize existing utility locations, with higher densities closest to existing mains and lowest densities in areas away from existing facilities. When new utility services are installed, the city should reexamine the zoning to see if a higher density is warranted.

Policy 1.9.3

Development approvals should be contingent upon facilities already being in place as the development occurs. The following actions constitute development: a building permit, subdivision approval, rezoning, shoreline permit, variance, or any other official action that affects the development of land. Provision for development application review and the timing of the actual impacts caused by the different types of developments should be adopted in the city's concurrency management system as part of the land development regulations.



Policy 1.9.4

Land developers should be financially responsible for onsite and off-site improvements that reduce direct impacts of the development. These improvements may include, but are not limited to, street improvements, installation of traffic safety features, paths and/or sidewalks, utility construction, utility capacity expansion, and drainage ways.

Policy 1.9.5

Impact fees should be used as a means for new development to pay its share of the costs of new or expanded facilities and services.

Policy 1.9.6

The city should not issue development permits that result in a reduction of the level of service (LOS) standard for the public facilities identified in the capital facilities element.

Policy 1.9.7

The city should prohibit development and uses that may negatively affect the quality and quantity of groundwater used for public water supplies.

**Policy 1.9.8**

The city should protect the quality and quantity of groundwater used for public water supplies.

Essential public facilities**Goal 1.10**

Essential public facilities in the city and its urban growth area should be consistent with the Growth Management Act and the following policies:

Policy 1.10.1

The project proponent shall provide a justifiable need for the essential public facility and its location within the city and urban growth area, based upon forecasted needs and a logical service area.

Policy 1.10.2

The project proponent shall provide a reasonable opportunity for the public and the city to participate in the site selection process.

Policy 1.10.3

Siting requirements for county facilities within the Buckley UGA shall be jointly and cooperatively established by the county and the city.

Policy 1.10.4

Essential public facilities should not be located in critical areas unless there is a demonstrated need and no alternative siting options are reasonable or feasible. Siting of essential public facilities within critical areas must be consistent with the comprehensive plan and development regulations.

Policy 1.10.5

Essential public facilities sited outside of urban growth areas must be self-supporting and not require the extension of municipal services and facilities.

Policy 1.10.6

No regulation or procedure may preclude siting an essential public facility within the city or its urban growth area.



Single family and duplexes are successfully mixed in Buckley neighborhoods.

2 Housing Element

Introduction.

Housing is a mandatory comprehensive planning element for Growth Management. The GMA states that a housing element is to ensure the vitality and character of established residential neighborhoods, create a policy base for encouraging housing, and identify sufficient land for all types of housing.



According to the population figures in the General Introduction to the Buckley Comprehensive Plan, the city is to plan intelligently for a 3 percent growth in the next 15 years.

Buckley should direct this growth in ways that benefit the community as a whole. Working creatively under the parameters of the GMA, Buckley can work to improve its housing stock, future housing developments, housing options and neighborhoods in ways that preserve and complement its historic and small town character.

Increased housing within Buckley brings a need to promote a range of housing options that meet the criteria for affordable housing so that new residents are able to move into the community and current residents are able to remain. Dispersing affordable housing throughout the community would ensure a mix of incomes within neighborhoods. Special incentives for low- and moderate-income housing should be

used as a means to promote affordable housing units by private or nonprofit developers.

Ensuring that neighborhoods are well-connected to amenities and community services and facilities is another goal in the housing element. This goal rests on the premise that neighborhoods, which are physically connected and easily accessible by foot, bike and automobile provide for a safer, healthier and more enjoyable environment. This goal is encouraged through policies that promote a street grid system (which is generally thought to be

more conducive for improved accessibility and orientation) and by requiring developers to provide connections to other neighborhoods, paths and trails where possible.

Neighborhoods that are well connected provide increased routes to destinations that, in turn, can improve public health and the environment. Improved connections help promote pedestrian and bicycle friendly environments and encourage sociability and safety. The concept also allows for better traffic flow and reduced congestion since emphasis is placed on increased entries and exits.

Existing Conditions:

The main issues facing Buckley in terms of housing include the following:

1. Ensuring that sufficient land for housing is identified and provided; and
2. Ensuring affordable housing is available for its citizens.

According to the percentage growth in the General Introduction, the city should plan for a variety of housing types. New residents could live in single family homes, apartment complexes, duplexes, triplexes, or in residences above businesses.

For the year 2013, the median home price in Buckley was about \$210,000 according to the Multiple Listing Service (MLS). According to the Office of Financial Management, the 2012 median home price in Washington State was \$234,200.



According to the 2010 census, the city contained 1,669 housing units with 1,065 units (63.8 percent) owner-occupied, and 526 units (31.5 percent) were renter-occupied; 78 units (4.7 percent) were unoccupied. Overall averaged household size was 2.5 for each unit, but 2.66 for owner-occupied homes, and 2.18 for rental units. Group quarters contained 374 people.

Of the 1,065 occupied units, 774 (48.6 percent) were husband-wife households with 143 (9 percent) of unmarried-partner households. "All other households" totaled 674 (42.4 percent).

For more demographics, please see Section 6 in the General Introduction to the Comprehensive Plan.

Jurisdiction	Median owner-occupied housing unit value with mortgage	Median owner-occupied housing unit value without mortgage
Buckley	\$250,100	\$195,700
Pierce County	\$256,300	\$233,300
Bonney Lake	\$279,900	\$238,300
King County	\$391,800	\$377,700

Source: American FactFinder, U.S. Census Bureau for 2012 five-year estimate



Strategy:

Buckley's housing goals aim to maintain its small town and historic character (see Goal 1.1). This is addressed in this element through policies that call for preserving Buckley's existing housing stock, using existing commercial structures for upstairs housing units, and incorporating design principles into new development standards. These housing goals include promoting a range of housing types to increase density and to also identify areas where density can be increased.

Density can be increased by building on underdeveloped areas unconstrained by critical lands, changing zoning where applicable, and through promoting higher density housing.

The GMA requires that all comprehensive plans ensure that sufficient affordable

housing is available in their communities. In response, Buckley's comprehensive plan Goal 2.3 is to provide sufficient affordable housing for the community. Specific policies are included that address providing affordable housing for the senior and low-income populations. Low income housing should be located within walking distance of public services, such as open space, health care, city hall, and grocery services.

Many different housing types can be used to increase density. Developments using duplexes, townhouses, cottage housing and single-family housing on small lots can complement the small town character. Through the 2005 comprehensive plan implementation, zoning allowed smaller lots than were allowed before 2005 and a variety of single, duplex, and triplex housing on lots within the R-6,000 and R-8,000 zones were permitted. This helps provide housing that is well served by public goods and services possible.



HOUSING ELEMENT GOALS AND POLICIES

Goal 2.1

Preserve Buckley's existing housing *character through integration of new development and redevelopment with the city's historic, small-town character.*

Policy 2.1.1

Incorporate neighborhood character and design principles into zoning and design review standards for new development.

Policy 2.1.2

Use the neighborhood mixed use zoning between commercial and single family zones to create a transition between commercial and residential zones.

Policy 2.1.3

Housing should be permitted above commercial uses in most commercial zones.

Policy 2.1.4

Housing should not be adjacent to intense commercial activities, such as gravel extraction, automotive wrecking, hazardous materials handling, and other businesses that contain environmental risks.

Policy 2.1.5

Create incentives to encourage rehabilitation and/or redevelopment of existing housing and historic structures.

Policy 2.1.6

Existing farms and residences should be protected by provision of buffers, fences, and distances.

Policy 2.1.7

Existing views of Mount Rainier should not be obstructed by new structures or landscaping wherever possible.



Policy 2.1.8

Manufactured housing should not be regulated differently from site-built housing.

Policy 2.1.9

Residential structures occupied by handicapped people should be regulated similarly to residential structures occupied by families of unrelated people.

Goal 2.2

Maintain low density multifamily uses in more dense single family zones.

Policy 2.2.1

Maintain housing approaches that are listed in the current zoning code that include duplexes and triplexes.

Policy 2.2.2

Complete future zoning code updates to include planned unit developments for both commercial and residential development, which should combine zero lot line development, townhouses, cottage houses, and other housing types.

Policy 2.2.3

Through the subdivision process, allow flexible lot sizes to decrease costs of installing utility lines and pavement by decreasing the required utility line and street lengths, and increasing the amount of open space.

Policy 2.2.4

Continue to allow accessory dwelling units on single family lots.

Policy 2.2.5

Ensure building codes will permits innovative housing designs including low impact housing.

Goal 2.3

Promote creation of affordable housing options throughout the city for all segments of the population.

Policy 2.3.1

Encourage development of a range of low income and senior housing opportunities convenient to services.

Policy 2.3.2

The city should enable affordable housing in new developments by offering incentives, such as density bonuses and economic incentives.

Policy 2.3.3

Affordable housing should be treated the same as other housing types and be allowed in market-rate housing areas.

Goal 2.4

Encourage pedestrian, bike, healthy food choices, gathering places, and auto connections within and between neighborhoods, schools, parks, and commercial areas, as described in Element 5.

Policy 2.4.1

Developers should provide connections to adjoining neighborhoods, access to trails, healthy food choices, gathering places, and also provide pedestrian and bike paths for their development.





Goal 2.5

Areas identified as vacant or underused in the county's buildable lands program *should be prioritized (targeted) for development.*

Policy 2.5.1

Consider increasing zoning density (exclusive of accessory dwelling units) served by city utilities and on lands identified as vacant or underused in the county's buildable lands program.

Policy 2.5.2

Multifamily housing should be screened from neighboring single family development to attenuate noise, traffic headlights, and increase privacy.

Goal 2.6

Encourage open space dedication and green building techniques in new construction.

Policy 2.6.1

Encourage using green buildings by increasing lot coverage minimums or providing economic incentives.





3 Economic Development

Introduction:

The Economic Development Element of the Comprehensive Plan is intended to support the promotion of enterprise and commercial exchange in Buckley and reinforce the overall vision and values of the Comprehensive Plan. Economic development is one of the GMA's thirteen mandated planning goals. Policies presented in this element will guide future City actions that, together with private sector actions, can produce a strong economy. The framework for this element is to retain and strengthen an economy that reinforces Buckley's small town character and capitalizes on its assets, including its history, rural quality, and natural resources.



Key issues that the Economic Development Element will address:

- How can Buckley create an economic plan that retains its small town qualities and promote economic vitality, including local jobs and taxable revenue for public services?
- How can Buckley further appropriate economic development activity that compliments other community needs and values?
- What are the specific strategies and actions the City can take to achieve its desired economic future?

Existing Conditions:

The largest sector of Buckley's non-agricultural employment, 26.5 percent, comes from Educational and Health Services. This is in part because of the City's largest employer, The Rainier School. It is followed by retail trade at 12.5 percent. The remaining categories of manufacturing, finance, insurance, and real estate services, and arts, entertainment, recreation, & food each employ about 6 percent.





These numbers have a large margin of error depending on the information sought. Because of its low population, Buckley's numbers are reviewed every five years rather than every year for larger cities.

Table I details approximate employment levels in selected occupations.

City	Retail trade	Manufacturing	Finance, Insurance, & Real Estate	Educational & health services	Arts, entertainment, recreation & food
Buckley	12.5%	6.2%	6.7%	26.5%	5.7%
Bonney Lake	13.4%	16.7%	6.1%	15.7%	8.5%
Enumclaw	9.6%	11.2%	6.3%	24.1%	9.5%
Pierce County	12.1%	10.2%	6.1%	21.5%	

Source: Department of Revenue, <http://dor.wa.gov/content/aboutus/statisticsandreports/TID/StatisticsReports.aspx?query=qbrmaics>

The comparison with nearby cities and the county shows that Buckley's employment in:

-  The finance, insurance, and real estate employment is similar to others.
-  Our educational and health care services employment is greatest.
-  Manufacturing and Arts are the lowest.
-  Retail trade is on par with Pierce County.

Economic Strategy:

The challenge facing Buckley is to create an economic climate that produces a healthy economy for jobs and businesses without compromising the community's desires to maintain its small town lifestyle and protect its natural amenities. The City is committed to ensure components that contribute to its quality of life (affordable housing, natural environment, good schools, efficient government and infrastructure) are available for residents and for future generations. These factors can also help the City to attract, retain and stimulate growth of local businesses. A strong tax base is essential to the City's ability to deliver necessary public services and maintain infrastructure to serve the needs of the community. In order to establish a sustainable economy, this Comprehensive Plan recommends the following actions:



- The City should promote existing businesses and concentrate new business development along the River Avenue corridor (Rainier Gateway Center), Main Street, and the Highway 410 corridor.
- The City should establish recreational infrastructure to attract tourism to Buckley. Despite its proximity to Mt. Rainier National Park and the presence of recreational vehicle

services, Buckley lacks the services and amenities for national park visitors, such as outdoor equipment outlets or a campground. Buckley is one of a few "Gateway Communities" in the Carbon River Corridor to Mt. Rainier and should attract a tourist base.

Other recreational projects include developing activity access points to the White River and completing the non-motorized Foothills trail, which will connect Buckley with South Prairie, Wilkeson, and Carbonado to the south, and with Orting and Puyallup to the west. The Park Element identifies the shoreline trail with park-like amenities as a priority for the city.

The City acknowledges that costs and benefits may be associated with economic activity. The costs include the direct provision of additional government services and also maintaining adequate infrastructure. Fiscal analysis that weighs the costs and the benefits of growth should be considered when developing regulations and procedures. Also, since future economic trends cannot be predicted with precision, economic policies and regulations should remain flexible.



GOALS & POLICIES

Goal 3.1

Promote, develop, and enhance a strong and sustainable economic climate.

Policy 3.1.1

Focus on the health of existing businesses through public awareness campaigns and local business promotions.

Policy 3.1.2

The city's regulations should provide the following to enhance sustainable economic development:

- a. Economic disincentives for vacant buildings.
- b. Overlay district design standards for each commercial area, one for east/west-bound SR 410, one for the area adjacent to northeast-bound SR 410, and one for the historic district.
- c. Procedures that are as streamlined as possible and still follow state requirements.

Policy 3.1.3

The city should provide a visitor or information center to attract and capture destination and pass-through tourist dollars.

Policy 3.1.4

The city should provide brochures that highlight its landmarks, parks, businesses, and other places of interest.

Policy 3.1.5

A park kiosk should be placed in a plaza near Main Street for business owners to use.

Policy 3.1.4

An over-the-street banner sign should be placed near SR 410 to display special events.

Goal 3.2

Promoting the economic climate should include all or some of the following actions:

Policy 3.2.1

Home-based businesses should be encouraged when they are compatible with residential neighborhood character.

Policy 3.2.2

Tourism should be enhanced by advertising Buckley's small-town attributes.

Policy 3.2.3

Historic downtown buildings should emphasize Buckley's small-town attributes through historic renovation.



Policy 3.2.4

A multiple tenant sign at the corner of Main and SR 410 should be installed to advertise the Main Street shops. An attention-getting structure, such as an archway over Main Street or the structures as proposed in the UW master class master plan should be installed.

Policy 3.2.5

Support installation of signs at our three city entrances that advertise the types of businesses that are available.

Policy 3.2.6

Partner with the business community to assist in the development and maintenance of signs for businesses within the Main Street downtown core.



Policy 3.2.7

Improve street signs at each intersection so that street names are obvious to travelers, such as large green signs over the highway.

Policy 3.2.8

The city should pave, sign, and advertise public parking areas for business activities.

Policy 3.2.9

The city should provide an information center within the city, such as in the museum, that qualifies for a brown, state tourist sign, and pay the annual fees for the sign.

Goal 3.3

Enhancing the economic climate should include all or some of the following actions:

Policy 3.3.1

Improve business signs at the end of the SR 410 corridor and at the intersection of SR 410 and Main Street.

Policy 3.3.2

The city should use marketing themes such as trains, logging, farming, and/or elk in art, architecture, and amenities at parks.

Policy 3.3.3

“Magnet” events, or special events that draw crowds, such as the circus, should be sought out and advertised well in advance of the event. Banner signs over Main Street or at the Logging Grounds could be used.

Policy 3.3.4

Maps of local points of interest in and around Buckley should be available for business owners to hand out; the maps should contain business advertisements and locations.

Goal 3.4

Developing the economic climate should include all or some of the following actions:

Policy 3.4.1

Jobs and businesses that are compatible with the community should be identified and programs developed to attract these jobs and/or programs to Buckley.

Policy 3.4.2

Business-friendly environment should be strengthened by attracting business trainers from experts such as from the Metropolitan Development Council in Tacoma and/or by offering economic incentives for businesses to do well.

Policy 3.4.3

The area between River Avenue and SR 410 is a place where people meet, recreate, and is an important open space area that gives the city a pleasant atmosphere. The area is zoned commercial and shops are planned to be erected between the Foothills Trail and River Avenue; the area between SR 410 and the trail will remain open space. The area should be designated with the county as a center of local importance and called the Rainier Gateway Center.





Policy 3.4.4

The city should recreate the train depot or allow a building in the form of a stage coach or train car to serve as a commercial site.

Policy 3.4.5

Transportation and trail systems should serve to enhance the city's economic health.

Goal 3.5

Define and use the city's *small-town attributes*.

Policy 3.5.1

The city's "small-town attributes" include at least the following: walkability across town, walkability to food, pharmacy, and businesses, residential porches facing street fronts, and large picture windows in businesses along Main Street. Providing pedestrian connections should be required as part of all development because these connections will promote pedestrian traffic to the business community.

Policy 3.5.2

Consider the city's "small-town attributes" when legislating or permitting may affect one of these characteristics.

Policy 3.5.3

Consider the city's "small-town attributes" in the design and of and review of how businesses function. Site plan reviews should include a review of vehicle and pedestrian flow, pedestrian and/or open space amenities, vegetative screens around parking lots, storefront windows along the street, and buildings closer to the highway separated by only two rows of parking.



Policy 3.5.4

The design of new developments and redevelopment projects should reflect and preserve Buckley's small-town appearance and historic uses such as agriculture, trains, and logging.

Policy 3.5.5

Uses in the downtown historic district should include only commercial with an emphasis on retail, except on the upper floor(s).

Policy 3.5.6

Downtown buildings that must be upgraded to meet current building codes should use the International Existing Building Code, which is designed for historic buildings.

Goal 3.6

Recreational infrastructure that shows off the city's natural features should be used to *enhance its economic development.*

Policy 3.6.1

When possible, open space areas should be protected as natural areas for public enjoyment or developed into recreational facilities.

Policy 3.6.3

The city should reduce permit submittal requirements for businesses that serve the need of the outdoor enthusiast market, such as bike shops, camping stores, sporting goods, and ski shops. Minimal requirements should include traffic impacts, drainage, and pedestrian access.



Policy 3.6.4

The city should pursue grants and partnerships to create and enhance natural amenities both in and around Buckley and promote outdoor activities, such as trails, campgrounds, river rafting, and so forth.

Goal 3.7

Ensure regulation balances economic growth with the quality of life and the environment.

Policy 3.7.1

Recognize and consider the economic, social, and environmental impacts upon the community of proposed legislative actions prior to formal adoption.

Policy 3.7.2

Because industrial and major commercial uses are compatible, they should be in the same vicinity and, inasmuch as possible, buffered from residential zones in the city.



GOAL 3.8

Expand and diversify funding sources to achieve economic goals.

Policy 3.8.1

Identify potential funding sources for economic development through existing federal, state, and non-governmental organizations.

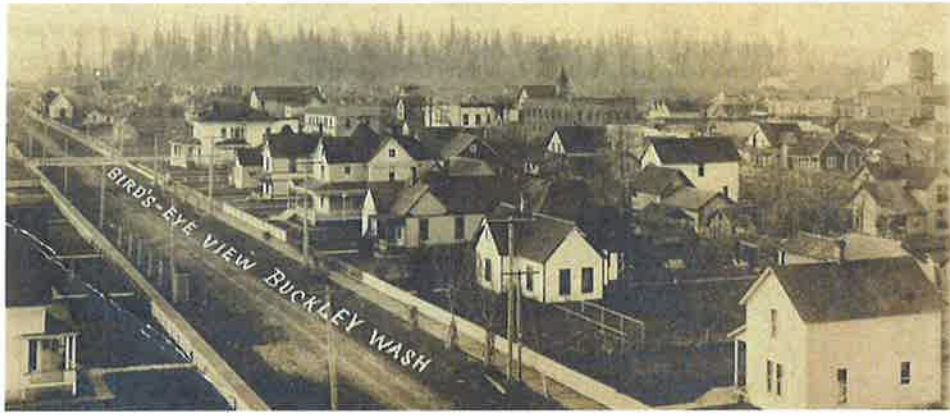
Policy 3.8.2

Ensure that the funding options pursued are specific to the projects that the city intends to develop.

Policy 3.8.3

The city should attract a diverse set of businesses to maintain a constant level of business trade.





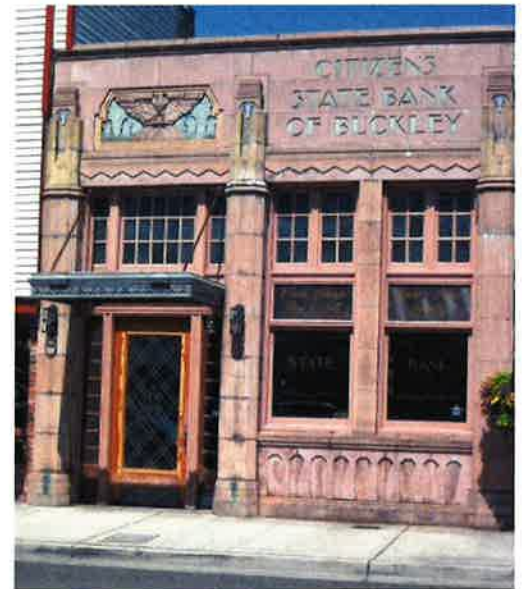
4 Urban Design

Introduction

As one of the oldest communities in Pierce County, Buckley is unique in the region for its small town character and historic and recreational resources. The farmland that surrounds the city isolated it from extensive physical expansion and intense commercial development.

Looking towards the future, Buckley confronts the challenge to preserve its unique character while accommodating economic and population growth. Incorporation of an urban design strategy within the policy framework of Buckley's Comprehensive Plan will help guide the City in its efforts to preserve and enhance Buckley characteristics that create special places where people want to be, places that are different from all other places.

Urban design considers the way buildings, streets and the spaces between them relate to one another with the goal of creating a vibrant, welcoming urban environment. Thoughtful urban design can help tie different areas of the city together visually and functionally. Urban design can help establish Buckley as a niche destination in the region—one that draws people to the city looking to experience the town's unique small town and historic atmosphere, and to take advantage of Buckley's proximity to recreation opportunities.



The quality of the built environment affects how people use space. For example, one rarely finds a small, cozy sidewalk café adjacent to a freeway or large parking lot. People are generally more comfortable in public places where they feel welcome and safe. The built environment also mirrors cultural values because when street networks isolate people from one another, community bonds weaken. This element attempts to reinforce positive social interaction by maintaining Buckley's small town character.

The Urban Design Element of Buckley's Comprehensive Plan is to guide the City in creating a more cohesive physical, economic, and social environment, and to help sustain and enhance quality of life in the context of future growth.



Existing Conditions:

Buckley is a town divided physically by a state highway, SR 410, which is at times difficult for pedestrians to cross. Businesses are divided into three basic areas: the west side between the intersection of SR 410 and SR 165 and Mundy Loss Road, the commercial area on the west side for SR 410 as it turns north, and the historic downtown commercial district. The west side is generally used for heavier commercial uses and industrial businesses, the central commercial area next to the highway contains strip malls and lighter commercial uses. The historic commercial district is used for various retails and services.

Residences are prevailingly single family residences with duplexes and accessory dwelling units intermixed.

In 1991 the City of Buckley adopted design guidelines, which identify two key districts: the

Downtown Review District; and the Highway Review District. Each area has specific guidelines pertaining to scale, detailing, setback requirements, sidewalk improvements, and details for renovation and construction of new and existing structures. The city reviews proposals for restoration and new development in the city's historic commercial core and the commercial and industrial corridor along State Route 410 in accordance with these guidelines.

In 2013, the city asked the University of Washington Urban Studies Master Students' Master Class to review the 2004 plan for the area bounded by SR 410, River, Main Street, and Ryan Road. During the initial visioning process as well as in the public processes with the UW master students, Buckley residents showed strong support for accentuating the Foothills Trail with small commercial/residential buildings while keeping the area between the trail and SR 410 as open space.



Using an aerial and blocks, the students created an "as is" representation of the subject area.



One design used a large shape of buildings at the intersection of SR 410 and Main Street.

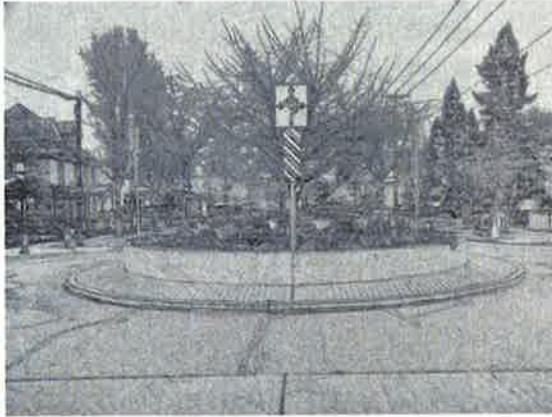
The other, below, features shorter buildings and a bridge across SR 410.



Using the same aerial and more blocks, participants created at least two different "design-scapes."



The Foothills trail was identified as "the new main street" in the city because of its constant use. The trail will continue in the near future across the river to Enumclaw, and Pierce County is scheduled to complete the missing pieces of the trail from Buckley to South Prairie in 2015.



As stated in the 2005 comprehensive plan, focusing on Buckley's identity will strengthen its sense of place, and project a distinct regional image for the town. This should also help foster community pride and increase Buckley's role in the regional tourist economy. Any theme Buckley chooses to guide its development should also reflect the town's values, history and proximity to the natural environment, as well as its perceived future.

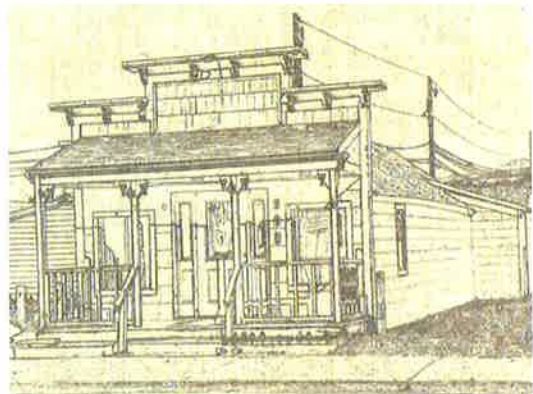
To recognize its past, historic buildings are important as they give Buckley a sense of identity as well as history. These buildings are community treasures, they mark some of Buckley's most cherished places and offer a unique perspective to the town's past. Marking and restoring historic buildings would reflect community pride and ensure they will remain for future generations to enjoy.

Urban Design Strategy:

Thoughtful urban design has the potential to improve functionality as well as aesthetics. Good urban design is more than just beautification; it acts as a catalyst to improve economic vitality, public safety, and sense of community.

The trail represents an untapped resource for the revitalization of Buckley's commerce. Through attention to the relationship between the trail and downtown, the commercial development of the trail may serve as a catalyst for the economic revitalization of the downtown. The intersection of the trail and Main Street, the nexus between two of Buckley's most important economic and recreational corridors, stands to unite two vital urban functions.

In the Buckley downtown, a thriving economy and a vibrant social atmosphere will go hand in hand. Urban design improvements can create a place where people want to visit and linger, and thus a place where businesses can succeed. Urban design will be a key element in helping to revitalize the downtown as the social and commercial heart of Buckley.



To best achieve this goal, particular emphasis must be placed on the experience of the pedestrian. A pedestrian-friendly commercial area will differentiate Buckley as a destination from other nearby automobile-oriented cities, and thus, will ensure the kind of face-to-face human interaction that is vital to a healthy community. When people travel outside their cars, social interaction is much more likely, and community bonds are strengthened. Additionally, non-

motorized transportation options greatly expand the opportunities of those who cannot afford a car, or cannot drive.

Giving people the option to travel in Buckley without the use of a car has the potential to improve the physical, economic, and social health of the community. Physical health can be improved through the increased activity associated with non-motorized transportation. Creating better non-motorized access to commercial areas will also help bring more local customers to Buckley businesses.

Buckley is faced with the challenges of encouraging economic growth and accommodating population growth within the city, while at the same time trying to preserve the City's unique small town character. As outlined in the following goals, policies, and objectives, the urban design strategy is to emphasize, accentuate, and highlight the city's unique features that set it apart from surrounding localities.

A major task in the City's urban design strategy will be developing commercial design guidelines that complement redevelopment.

Another task is implementing guidelines and other zoning regulations that call for physical and thematic connections between different areas of the city. The urban design strategy is intended to support the goals contained in other elements of the Comprehensive Plan.



URBAN DESIGN GOALS AND POLICIES



Goal 4.1

Enhance the built environment to promote the economic and social vitality along the main street commercial core.

Policy 4.1.1

Develop pedestrian infrastructure by widening sidewalks, installing crosswalks, corner plazas, bollards, street furniture, and so forth.

Policy 4.1.2

Enhance street appeal with amenities such as: News kiosks, Lighting, Water fountains, Trees/planter boxes, Pavement treatments, Street names, and Facade improvements.

Policy 4.1.3

Enhance business vitality through storefront visibility and transparency and by allowing commercial activity to spill out onto the sidewalk. New construction should have large picture windows to show off merchandise inside.

Policy 4.1.4

Develop mixed-use buildings with housing above commercial space.

Goal 4.2

Strengthen the relationship between the trail and downtown.

Policy 4.2.1

Install additional signs to indicate attractions in downtown.

**Policy 4.2.2**

Develop a visual link between the trail and downtown, using elements such as pavement materials or landscaping; for example, the existing small plaza could be enhanced to help connect the trail with downtown.

Policy 4.2.3

Develop a place of respite on the bike path as it passes Main Street to encourage trail users to stop and visit downtown.

Policy 4.2.4

Encourage retail consistent with recreational use between the trail and River Avenue.

Goal 4.3

Foster Buckley's role as a destination point by enhancing the town's visibility and identity.

Policy 4.3.1

Develop a way-finding system that highlights historic landmarks tourist facilities, pedestrian corridors and other places of interest in the downtown area through the use of signs and kiosks.

Policy 4.3.2

Develop a common 'design theme' that is related to Buckley's history and natural surroundings to guide the development of new residential neighborhoods, public art pieces and way-finding systems.

Policy 4.3.3

Develop a visual marker on SR 410 to serve as a gateway to Buckley, with an emphasis on travel from Enumclaw.

Policy 4.3.4

The city should require pedestrian-scale signs that create a place where people feel welcome.

Goal 4.4

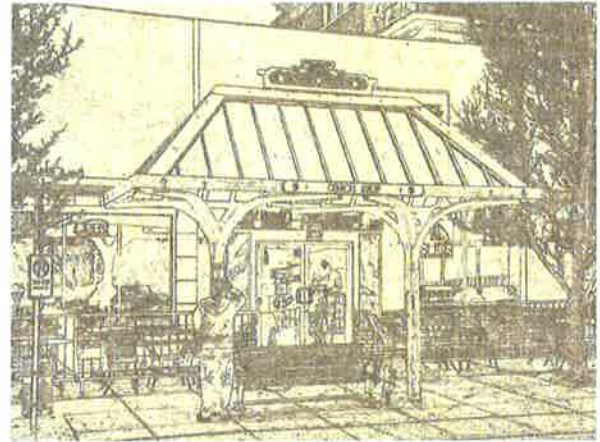
Enhance the potential for non-motorized transportation options throughout Buckley.

Policy 4.4.1

Develop a plan for walking and/or biking trails to encourage connectivity between adjacent residential subdivisions, and between residential areas and the downtown core.

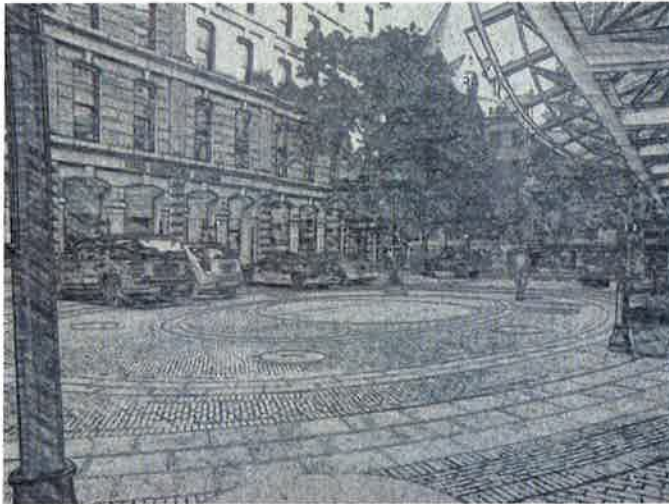
Policy 4.4.2

Ensure that all new development provides adequate pedestrian and bicycle infrastructure, such as sidewalks, crosswalks, bike paths, and bike racks.



Policy 4.4.3

Eliminate barriers to pedestrians such as dead ends, unnecessary fences or overgrown vegetation, and create dedicated connections such as permanent paths or stairways.



Policy 4.4.4

Improve existing pedestrian and bicycle infrastructure by installing sidewalks, crosswalks, bike lanes, and bike racks where needed.

Policy 4.4.5

Provide safe and convenient pedestrian linkages across SR 410 through the use of signalized crosswalks or a pedestrian bridge.

Policy 4.4.6

Work toward a future regional transit stop in

Buckley's downtown core through establishing public parking areas, park-n-ride lots, and commercial areas around public parking lots.

Goal 4.5

New development in the City of Buckley should strengthen the small town character and foster community interaction.

Policy 4.5.1

Use Building design that relates to the street through design elements such as building setbacks and front porches.

Policy 4.5.2

Encourage alleys when developing extensions of the street network to screen from view overhead wires, parking structures, and other visual blight.

Policy 4.5.3

Encourage compact grid street patterns rather than dead ends or long blocks that are more typical of modern subdivisions.

Policy 4.5.4

Where dead ends exist, encourage pedestrian paths and “cut throughs.”

Goal 4.6

Identify and preserve buildings with unique historic character.

Policy 4.6.1

The city should inventory buildings with unique architectural and historic character within the city.

Policy 4.6.2

The city should develop design guidelines to guide renovation of historic buildings and new development adjacent to them.



Encourage pedestrian paths and 'cut throughs' where dead ends exist.

2.16 MISCELLANEOUS FITTINGS

A. FLEXIBLE COUPLINGS

Flexible couplings shall be Romac 501 or approved equal. Middle ring and follower shall have fusion bonded epoxy coating. All buried flexible couplings shall be furnished with stainless steel bolts and nuts.

Harness lugs and tie bolts for harnessed joints on steel pipe shall comply with AWWA M-11, Third Edition and as shown on the Plans. All buried harnessed joints shall be furnished with stainless steel tie bolts and nuts.

B. FLANGED COUPLING ADAPTERS

Flanged coupling adapters shall be Rockwell (Smith-Blair) Type 912 Dresser Style 127 or equal.

C. ADAPTER FLANGES

Adapter flanges for ductile iron pipe shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. Flange dimensions shall be in accordance with ANSI B16.1, 125-lb. pattern. Gasket shall be Buna-N. Setscrews shall be AISI 4140, high strength, low alloy steel. The adapter flanges shall be Uni-Flange Series 400, or equal.

D. GROOVED PIPE COUPLERS

Grooved pipe couplers for steel pipe shall consist of two ductile iron housing segments conforming to ASTM A536, pressure responsive elastomer gasket, and ASTM A449 zinc electroplated steel bolts and nuts. Couplings shall comply with ASTM F1476 "Standard Specification for the Performance of Fittings for Use with Gasketed Mechanical Couplings Used in Piping Applications."

1. Rigid Type

Housings shall be cast with offsetting angle-pattern bolt pads to provide rigidity and system support and hanging in accordance with ANSI B31.1 and B31.9.

a. 2 Inch through 8 Inch

Installation-Ready, for direct stab installation without field disassembly, with grade EHP gasket rated to +250 degrees

1 Sponsored by: Councilmember Rick Talbert
2 Requested by: Executive/Planning and Land Services
3
4
5

6 **ORDINANCE NO. 2011-36s**

7
8

9 **An Ordinance of the Pierce County Council Establishing the Growth** 10 **Management Act Population, Housing Unit, and Employment** 11 **Targets for Cities, Towns and Unincorporated Areas of Pierce** 12 **County for the Year 2030; and Adopting Findings of Fact.** 13

14 **Whereas**, on July 1, 1990, the Growth Management Act (GMA) became effective
15 (Chapter 36.70A Revised Code of Washington); and
16

17 **Whereas**, GMA requires Pierce County Government (the County), and cities and
18 towns within Pierce County, to plan for projected needs, based upon projected
19 population growth, in the Land Use, Housing, Capital Facilities, and Transportation
20 elements of a jurisdiction's Comprehensive Land Use Plan (RCW 36.70A.070); and
21

22 **Whereas**, GMA requires the County to designate urban growth areas based
23 upon the urban growth management population projection made for the County by the
24 Office of Financial Management ("OFM") (RCW 36.70A.110); and
25

26 **Whereas**, the Central Puget Sound Growth Management Hearings Board
27 (Board) is one of the three administrative appeal boards created by GMA (former RCW
28 36.70A.250). The Board has concluded that the County has the authority, as a regional
29 government, to allocate population and employment to the cities, *City of Edmonds and*
30 *City of Lynnwood v. Snohomish County* (CPSGMHB Case No. 93-3-0005); and
31

32 **Whereas**, the Board noted that the counties should allocate the OFM population
33 projections among both the incorporated and unincorporated portions of urban growth
34 areas and the non-urban growth areas within the County, and the Board suggested that
35 the counties allocate OFM population projections through GMA's "interactive and
36 iterative" process, which includes collaborating with the cities and the towns (see also
37 RCW 36.70A.100 and RCW 36.70A.110); and
38

39 **Whereas**, the Pierce County Council adopted Resolution No. R94-153 to allocate
40 2012 population projections to the cities, towns and unincorporated areas of Pierce
41 County; and
42

43 **Whereas**, the Pierce County Council adopted Resolution No. R97-59 to allocate
44 2017 population projections to the cities, towns and unincorporated areas of Pierce
45 County; and
46



DISTRIBUTION:

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Sean Gaffney, Planning and Land Services ✓
Dan Cardwell, Planning and Land Services ✓
Toni Fairbanks, Planning and Land Services ✓
Pierce County Regional Council ✓
Pierce County Growth Management Coordinating Committee ✓
Al Rose, Executive Office ✓
Keri Rooney, Executive Office ✓

8/16/2011 jms
Date/initials

1 **Whereas**, the Pierce County Council adopted Resolution No. R2000-173 to
2 update the 2017 population allocation for four jurisdictions; and
3

4 **Whereas**, the Pierce County Council adopted Ordinance No. 2003-104s to
5 allocate 2022 population projections to the cities, towns, and unincorporated areas of
6 Pierce County; and
7

8 **Whereas**, the County and its cities and towns are required to include an analysis
9 of the population allocated to a city or county from the most recent ten-year population
10 forecast by OFM in their GMA plan compliance update; and
11

12 **Whereas**, OFM published the latest series of GMA population projections in
13 November 2007; and
14

15 **Whereas**, OFM's population projection for Pierce County in 2030 ranges from a
16 low of 903,819 to a high of 1,213,326, with midrange of 1,050,953; and
17

18 **Whereas**, the GMA directs the Puget Sound region to adopt multi-county
19 planning policies; and
20

21 **Whereas**, the Puget Sound Regional Council (PSRC) membership is comprised
22 of central Puget Sound counties (King, Pierce, Snohomish, and Kitsap), cities and
23 towns, ports, tribes, and transit agencies; and
24

25 **Whereas**, the PSRC is the regional authority to adopt multi-county planning
26 policies; and
27

28 **Whereas**, the PSRC adopted VISION 2040 at its May 2008 General Assembly
29 meeting; and
30

31 **Whereas**, VISION 2040 is the central Puget Sound region's multi-county
32 planning policies; and
33

34 **Whereas**, the County and its cities and towns comprehensive plans must be
35 consistent with VISION 2040; and
36

37 **Whereas**, VISION 2040 requires Pierce County and its cities and towns to adopt
38 housing unit and employment targets; and
39

40 **Whereas**, VISION 2040's Regional Growth Strategy (RGS) categorizes
41 jurisdictions into one of six regional geographies; and
42

43 **Whereas**, VISION 2040's RGS identifies a growth share for population and
44 employment per regional geography; and
45



1 **Whereas**, the Pierce County Regional Council (PCRC) is a multi-jurisdictional
2 group comprised of elected officials who represent the County and its cities and towns;
3 and
4

5 **Whereas**, the Pierce County Growth Management Coordinating Committee
6 (GMCC) is a technical subcommittee to the Pierce County Regional Council (PCRC),
7 and the GMCC includes staff representatives from the County and its cities and towns;
8 and
9

10 **Whereas**, over a period of several months the GMCC met to review the
11 proposed population, housing and employment targets for the year 2030; and
12

13 **Whereas**, VISION 2040's regional geography growth shares were considered in
14 the formulation of preliminary 2030 targets; and
15

16 **Whereas**, jurisdictions provided documentation to justify deviation from VISION
17 2040's regional growth shares; and
18

19 **Whereas**, the draft targets were forwarded to the PCRC for review and
20 comment; and
21

22 **Whereas**, the GMCC recommended the proposed 2030 population allocation to
23 the PCRC at its June 24, 2010, meeting; and
24

25 **Whereas**, after the GMCC made its recommendation a technical error was
26 discovered in converting the population targets to housing unit targets; and
27

28 **Whereas**, the City of Sumner requested a revision to its initial requested
29 population target; and
30

31 **Whereas**, the GMCC amended its initial recommendation to the PCRC at its
32 January 27, 2011, meeting to rectify the technical error and to accommodate the City of
33 Sumner's request; and
34

35 **Whereas**, the PCRC, based upon the recommendation from the GMCC and its
36 own discussions, recommended the proposed 2030 population, housing unit, and
37 employment targets, which are incorporated in Exhibit A, at its April 21, 2011, meeting;
38 and
39

40 **Whereas**, the Pierce County Planning Commission held a public hearing at its
41 May 24, 2011, meeting on the proposed 2030 targets and recommended approval of
42 the PCRC's recommendation; and
43

44 **Whereas**, an environmental review of the proposed amendments to the Pierce
45 County Countywide Planning Policies was conducted pursuant to Chapter 43.21C RCW
46 and a Determination of Nonsignificance was issued on October 26, 2010; and
47



1 **Whereas**, after a properly noticed public hearing, the Community Development
2 Committee of the County Council considered oral and written testimony at its June 20,
3 2011, meeting and forwarded its recommendation to the full Council; and
4

5 **Whereas**, the County Council held a public hearing on July 19, 2011, where oral
6 and written testimony was considered; **Now Therefore**,
7

8 **BE IT ORDAINED by the Council of Pierce County:**
9

10 Section 1. The Pierce County population, housing unit, and employment targets
11 for GMA planning purposes for the year 2030 are hereby adopted as shown in Exhibit
12 A, which is attached hereto and incorporated herein.
13

14 Section 2. Findings of Fact are hereby adopted as shown in Exhibit B, which is
15 attached hereto and incorporated herein.
16

17 **PASSED** this 19th day of July, 2011.
18

19 **ATTEST:**

PIERCE COUNTY COUNCIL

Pierce County, Washington

20
21
22 Denise D. Johnson
23
24 **Denise D. Johnson**
25 Clerk of the Council
26

Roger Bush
Roger Bush
Council Chair
27

Pat McCarthy
Pat McCarthy
Pierce County Executive
Approved ☒ Vetoed ☐, this
28 27 day of July,
29 2011.
30
31
32
33
34

35 Date of Publication of
36 Notice of Public Hearing: June 22, 2011
37

38 Effective Date of Ordinance: August 6, 2011
39



Table 1. 2030 Population Target¹
by VISION 2040 Regional Geography

Jurisdiction	Estimated '08 Population	'08 – '30 Population Growth	'30 Total Population Allocation
Metropolitan City Geography			
Tacoma	202,700	78,600	281,300
Core Cities Geography			
Auburn	6,605	1,345	7,950
Lakewood	58,780	13,220	72,000
Puyallup	36,930	13,070	50,000
Large Cities Geography			
Fife	7,525	1,900	9,425
University Place	31,440	8,100	39,540
Small Cities Geography			
Bonney Lake	16,220	5,420	21,640
Buckley	4,560	2,940	7,500
Carbonado	655	145	800
DuPont	7,390	4,510	11,900
Eatonville	2,375	745	3,120
Edgewood	9,595	4,105	13,700
Fircrest	6,315	635	6,950
Gig Harbor	6,910	3,590	10,500
Milton	5,710	40	5,750
Orting	6,075	1,925	8,000
Pacific	105	-	-
Roy	875	195	1,070
Ruston	755	695	1,450
South Prairie	440	310	750
Steilacoom	6,255	575	6,830
Sumner	9,060	2,910	11,970
Wilkeson	465	105	570
Unincorporated Urban Geography²			
Unincorporated Urban P.C.	174,965	60,000	234,965
McChord/Fort Lewis	29,300	1,000	30,300
Rural Geography			
Rural	173,392	3,600	176,992
P.C. Urban and Rural Geographies			
Total	805,397	209,680	1,014,972

¹ The 2008 estimates and 2030 allocation are for the 2008 municipal boundaries and urban service areas (USAs).

² Pierce County will further sub-allocate its urban unincorporated employment target to individual urban service/urban growth areas in consultation with the respective cities and towns.



Table 2. 2030 Housing Target¹
by VISION 2040 Regional Geography

Jurisdiction	Estimated '08 Housing Units (OFM)	'08 – '30 Housing Unit Growth	'30 Total Housing Unit Allocation
Metropolitan City Geography			
Tacoma	85,780	43,250	129,030
Core Cities Geography			
Auburn	3,244	390	3,634
Lakewood	25,904	8,380	34,284
Puyallup	15,631	6,980	22,611
Large Cities Geography			
Fife	3,767	690	4,457
University Place	13,448	5,250	18,698
Small Cities Geography			
Bonney Lake	5,828	2,670	8,498
Buckley	1,690	1,240	2,930
Carbonado	218	80	298
DuPont	3,191	2,100	5,291
Eatonville	943	410	1,353
Edgewood	3,803	2,200	6,003
Fircrest	2,811	540	3,351
Gig Harbor	3,301	2,130	5,431
Milton	2,539	240	2,779
Orting	2,241	880	3,121
Pacific	45	-	-
Roy	307	180	487
Ruston	365	390	775
South Prairie	161	120	281
Steilacoom	2,795	590	3,385
Sumner	3,973	1,770	5,743
Wilkeson	178	60	238
Unincorporated Urban Geography²			
Unincorporated Urban P.C.	71,563	28,000	99,563
McChord/Fort Lewis	4,710	300	5,010
Rural Geography			
Rural	65,447	7,910	73,360
P.C. Urban and Rural Geographies			
Total	323,883	116,750	440,588

¹ The 2008 estimates and 2030 allocation are for the 2008 municipal boundaries and urban service areas (USAs).

² Pierce County will further sub-allocate its urban unincorporated employment target to individual urban service/urban growth areas in consultation with the respective cities and towns.



Table 3. 2030 Total Employment Targets
by VISION 2040 Regional Geography

Jurisdiction	'08 Total Employment Estimate	'30 Total Employment Target	'08 – '30 Total Employment Growth ³
Metropolitan City Geography			
Tacoma	112,717	176,930	64,213
Core Cities Geography			
Auburn	628	834	206
Lakewood	29,051	38,336	9,285
Puyallup	25,267	34,267	9,000
Large Cities Geography			
Fife	15,011	19,300	4,289
University Place	6,593	9,593	3,000
Small Cities Geography			
Bonney Lake	4,307	5,448	1,141
Buckley	2,805	3,033	228
Carbonado	63	68	5
DuPont	3,158	9,078	5,920
Eatonville	901	2,335	1,434
Edgewood	1,664	3,094	1,430
Fircrest	1,427	1,544	117
Gig Harbor	8,351	9,954	1,603
Milton	1,893	2,337	444
Orting	1,170	2,370	1,200
Pacific	2,529	6,505	3,976
Roy	178	342	164
Ruston	222	494	272
South Prairie	84	307	223
Steilacoom	688	788	100
Sumner	10,828	20,135	9,307
Wilkeson	75	153	78
Unincorporated Urban Geography²			
Unincorporated Urban P.C.	49,325	65,893	16,568
Unincorporated Urban - JBLM	30,889	45,756	14,867
Rural Geography			
Rural	21,784	22,834	1,050
Total¹	331,608 (300,719 excluding JBLM)	481,728 (435,972 excluding JBLM)	150,120 (135,253 excluding JBLM)

1 ¹ Excluding JBLM: '08 Total Employment Estimate = 300,719; '30 Total Employment Target = 435,972, and; '08 – '30 Total Employment Growth = 135,253.

2 ² Pierce County will further sub-allocate its urban unincorporated employment target to individual urban service/urban growth areas in consultation with the respective cities and towns.

3 ³ The total employment allocations should be reduced by 12.1 percent to account for mobile workers and work-at-home employees for its commercial/industrial land needs analysis.



Findings of Fact

The Pierce County Council finds that:

1. The Growth Management Act (GMA) requires the County, and cities and towns within it, to plan for projected needs, based upon projected population growth, in the Land Use, Housing, Capital Facilities, and Transportation elements of a jurisdiction's Comprehensive Land Use Plan (RCW 36.70A.070).
2. Pierce County and its cities and towns are required to include an analysis of the population allocated to a city or county from the most recent ten-year population forecast by the Washington State Office of Financial Management (OFM) in their GMA plan compliance update.
3. OFM published the latest series of GMA population projections in November 2007.
4. OFM's population projection for Pierce County in 2030 ranges from a low of 903,819 to a high of 1,213,326, with a midrange of 1,050,953.
5. The 2030 allocations are based on the municipal boundaries of 2008.
6. VISION 2040 is the central Puget Sound region's multi-county planning policies.
7. Pierce County and its cities and towns' comprehensive plans are required to be consistent with VISION 2040.
8. The Pierce County Council finds that VISION 2040 requires Pierce County and its cities and towns to adopt housing unit and employment targets.
9. VISION 2040's Regional Growth Strategy (RGS) identifies 40-year growth shares for identified regional geographies.
10. VISION 2040's planning horizon is between 2000 and 2040.
11. A significant amount of growth occurred in Pierce County between 2000 and 2008 that is inconsistent with VISION 2040's RGS.
12. Technical Appendix II-B of VISION 2040 provides additional guidance to Pierce County and its cities and towns for aligning local growth targets with the RGS.
13. Technical Appendix II-B of VISION 2040 acknowledges recent growth has been at such significant odds with policy direction set by the RGS that the 2040 goal will likely not be met.
14. Technical Appendix II-B of VISION 2040 requests jurisdictions to try their best to set any new targets as close to VISION 2040 as reasonably possible.



- 1 15. Technical Appendix II-B of VISION 2040 asks jurisdictions to explain what steps they
2 are taking to "bend the trend" of recent growth to align to the concepts of VISION
3 2040.
- 4
- 5 16. Pierce County and its and towns have adequately documented challenges in achieving
6 VISION 2040's regional geography growth shares.
- 7
- 8 17. Pierce County has documented potential strategies intended to "bend the trend." The
9 strategies may include, but not limited to: (1) establishing a base density and requiring
10 incentives such as TDR or green building to reach maximum density, (2) establishing
11 an urban reserve designation within the existing urban growth area, (3) establishing a
12 land use/transportation strategy that redirects growth to a limited number of mixed use
13 centers in each of the community plan areas, (4) decreasing the urban growth area in
14 locations which are not encumbered with existing urban density, infrastructure
15 improvements, or vested projects, (5) modifying the County's policy on time extensions
16 for vested applications, (6) eliminating policies and code provisions that allow for
17 "exceptions" such as building without sewer or limiting bonus densities, (7) modifying
18 requirements for future comprehensive plan amendment applications, (8) reviewing
19 Capital Facilities and only improve for safety or where growth is directed to centers,
20 and (9) changing the permit fee structure to discourage growth outside centers.
- 21
- 22 18. The Puget Sound Regional Council (PSRC) participated in the process of developing
23 the draft targets.
- 24
- 25 19. PSRC staff had an opportunity to review the PCRC's recommended population,
26 housing unit, and employment targets for unincorporated Pierce County and its cities
27 and towns and voiced support for the proposal at a Pierce County Regional Council
28 meeting.
- 29
- 30 20. Pierce County and its cities and towns had the opportunity to review and request
31 modifications to the 2030 population, housing unit, and employment targets through
32 the Growth Management Coordinating Committee and Pierce County Regional
33 Council.
- 34
- 35 21. The PCRC recommended approval of the proposed 2030 population, housing and
36 employment targets at its April 21, 2011, meeting
- 37
- 38 22. Pierce County consulted with local jurisdictions as required by GMA through the
39 GMCC and PCRC.
- 40
- 41 23. An environmental review of the proposed amendments to the Pierce County
42 Countywide Planning Policies was conducted pursuant to Chapter 43.21C RCW and a
43 Determination of Nonsignificance was issued on October 26, 2010.
- 44
- 45 24. The Pierce County Planning Commission held a public hearing at its May 24, 2011,
46 meeting on the proposed 2030 targets and recommended approval of the PCRC's
47 recommendation.
- 48
- 49 25. The Community Development Committee of the County Council, after a properly
50 noticed public hearing, considered oral and written testimony and forwarded its
51 recommendation to the full Council.
- 52



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26. The County Council held a public hearing on July 19, 2011 where oral and written testimony was considered
27. It is in the County's interest to adopt the 2030 population, housing and employment targets recommended by the PCRC.



APPENDIX G

DETAILED COST ESTIMATES

**CITY OF BUCKLEY: SEWER COMPREHENSIVE PLAN
CAPITAL IMPROVEMENT PLAN**

Project Number	Project Description	Size (IN)	Length (LF)	Manhole (EA)	In Street (LF)	Off Street (LF)	Construction Cost	Project Cost
G-1	Alley to the East of Edith Street, from Park Ave to Dundass Street	8	450	2	40	410	\$ 121,000	\$ 151,000
G-2	Spiketon Road from Ryan Road to A Street	8	500	3	170	330	\$ 144,000	\$ 180,000
G-3	Alley between Cascade St and Edith St from Fourth Ave to Park Ave	8	450	2	40	410	\$ 124,000	\$ 155,000
G-4	Near 550 Balm Street	8	200	2	200	-	\$ 81,000	\$ 101,000
G-5	Spiketon Road from Ryan road to 649 Spiketon Road	8	900	3	40	860	\$ 227,000	\$ 284,000
G-6	Alley between Naches St and Second St from Park Ave to Mason Ave	8	1,000	4	160	840	\$ 260,000	\$ 325,000
T-1	McNeely St south, east on Mason to State School Prop line, South to Ryan Road to Klink St	12	4,800	16	1,420	3,380	\$ 1,306,000	\$ 1,633,000
F-1	South Spiketon Road Force Main	6	1,300	N/A	1,300	-	\$ 202,000	\$ 253,000
L-1	South Spiketon Road Lift Station			500 gpm			\$ 669,000	\$ 866,000
	Total						3,134,000	3,948,000

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT G-1: Alley to the East of Edith Street, from Park Ave to Dundass Street

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u> <u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM	\$ 9,000.00	\$ 9,000.00
2	Trench Excavation Safety Systems	LUMP SUM	\$ 2,000.00	\$ 2,000.00
3	Erosion Control (2%)	LUMP SUM	\$ 1,500.00	\$ 1,500.00
4	Locate Existing Utilities (2%)	LUMP SUM	\$ 1,500.00	\$ 1,500.00
5	Solid Wall PVC Sanitary Sewer Pipe, 8 In. Diam.	450 LF	\$ 80.00	\$ 36,000.00
6	48" Sanitary Sewer Manhole	2 EA	\$ 5,000.00	\$ 10,000.00
7	Connections to Existing	1 EA	\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	100 LF	\$ 50.00	\$ 5,000.00
9	Gravel Backfill	780 TN	\$ 16.50	\$ 12,870.00
10	Foundation Gravel	20 TN	\$ 35.00	\$ 700.00
11	Asphalt Concrete Pavement Repair	30 TN	\$ 210.00	\$ 6,300.00
12	Cold Mix Asphalt	20 TN	\$ 200.00	\$ 4,000.00
13	Crushed Surfacing, Top Course	60 TN	\$ 35.00	\$ 2,100.00
14	Surface Restoration	20 SY	\$ 5.50	\$ 110.00
Subtotal:.....				\$ 93,580.00
Sales Tax (7.9%):.....				\$ 7,392.82
Subtotal:.....				\$ 100,972.82
Contingency (20%):.....				\$ 20,027.18
TOTAL ESTIMATED CONSTRUCTION COST:.....				\$ 121,000.00
Engineering and Administrative Costs (25%):.....				\$ 30,000.00
R.O.W. and/or Easement Acquisition:.....				\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....				\$ 151,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT G-2: Spiketon Road from Ryan Road to A Street

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u> <u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM	\$ 11,000.00	\$ 11,000.00
2	Trench Excavation Safety Systems	LUMP SUM	\$ 2,000.00	\$ 2,000.00
3	Erosion Control (2%)	LUMP SUM	\$ 2,000.00	\$ 2,000.00
4	Locate Existing Utilities (2%)	LUMP SUM	\$ 2,000.00	\$ 2,000.00
5	Solid Wall PVC Sanitary Sewer Pipe, 8 In. Diam.	500 LF	\$ 80.00	\$ 40,000.00
6	48" Sanitary Sewer Manhole	3 EA	\$ 5,000.00	\$ 15,000.00
7	Connections to Existing	1 EA	\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	100 LF	\$ 50.00	\$ 5,000.00
9	Gravel Backfill	870 TN	\$ 16.50	\$ 14,355.00
10	Foundation Gravel	20 TN	\$ 35.00	\$ 700.00
11	Asphalt Concrete Pavement Repair	40 TN	\$ 210.00	\$ 8,400.00
12	Cold Mix Asphalt	20 TN	\$ 200.00	\$ 4,000.00
13	Crushed Surfacing, Top Course	120 TN	\$ 35.00	\$ 4,200.00
14	Surface Restoration	20 SY	\$ 5.50	\$ 110.00
Subtotal:.....				\$ 111,265.00
Sales Tax (7.9%).....				\$ 8,789.94
Subtotal:.....				\$ 120,054.94
Contingency (20%):.....				\$ 23,945.07
TOTAL ESTIMATED CONSTRUCTION COST:.....				\$ 144,000.00
Engineering and Administrative Costs (25%):.....				\$ 36,000.00
R.O.W. and/or Easement Acquisition:.....				\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....				\$ 180,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT G-3: Alley between Cascade St and Edith St from Fourth Ave to Park Ave

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u> <u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM	\$ 10,000.00	\$ 10,000.00
2	Trench Excavation Safety Systems	LUMP SUM	\$ 2,000.00	\$ 2,000.00
3	Erosion Control (2%)	LUMP SUM	\$ 1,500.00	\$ 1,500.00
4	Locate Existing Utilities (2%)	LUMP SUM	\$ 1,500.00	\$ 1,500.00
5	Solid Wall PVC Sanitary Sewer Pipe, 8 In. Diam.	450 LF	\$ 80.00	\$ 36,000.00
6	48" Sanitary Sewer Manhole	2 EA	\$ 5,000.00	\$ 10,000.00
7	Connections to Existing	1 EA	\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	120 LF	\$ 50.00	\$ 6,000.00
9	Gravel Backfill	780 TN	\$ 16.50	\$ 12,870.00
10	Foundation Gravel	20 TN	\$ 35.00	\$ 700.00
11	Asphalt Concrete Pavement Repair	30 TN	\$ 210.00	\$ 6,300.00
12	Cold Mix Asphalt	20 TN	\$ 200.00	\$ 4,000.00
13	Crushed Surfacing, Top Course	70 TN	\$ 35.00	\$ 2,450.00
14	Surface Restoration	20 SY	\$ 5.50	\$ 110.00
Subtotal:.....				\$ 95,930.00
Sales Tax (7.9%):.....				\$ 7,578.47
Subtotal:.....				\$ 103,508.47
Contingency (20%):.....				\$ 20,491.53
TOTAL ESTIMATED CONSTRUCTION COST:.....				\$ 124,000.00
Engineering and Administrative Costs (25%):.....				\$ 31,000.00
R.O.W. and/or Easement Acquisition:.....				\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....				\$ 155,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT G-4: Near 550 Balm Street

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u> <u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM	\$ 6,000.00	\$ 6,000.00
2	Trench Excavation Safety Systems	LUMP SUM	\$ 2,000.00	\$ 2,000.00
3	Erosion Control (2%)	LUMP SUM	\$ 1,000.00	\$ 1,000.00
4	Locate Existing Utilities (2%)	LUMP SUM	\$ 1,000.00	\$ 1,000.00
5	Solid Wall PVC Sanitary Sewer Pipe, 8 In. Diam.	200 LF	\$ 80.00	\$ 16,000.00
6	48" Sanitary Sewer Manhole	2 EA	\$ 5,000.00	\$ 10,000.00
7	Connections to Existing	1 EA	\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	60 LF	\$ 50.00	\$ 3,000.00
9	Gravel Backfill	350 TN	\$ 16.50	\$ 5,775.00
10	Foundation Gravel	30 TN	\$ 35.00	\$ 1,050.00
11	Asphalt Concrete Pavement Repair	40 TN	\$ 210.00	\$ 8,400.00
12	Cold Mix Asphalt	20 TN	\$ 200.00	\$ 4,000.00
13	Crushed Surfacing, Top Course	50 TN	\$ 35.00	\$ 1,750.00
14	Surface Restoration	20 SY	\$ 5.50	\$ 110.00
Subtotal:.....				\$ 62,585.00
Sales Tax (7.9%).....				\$ 4,944.22
Subtotal:.....				\$ 67,529.22
Contingency (20%).....				\$ 13,470.79
TOTAL ESTIMATED CONSTRUCTION COST:.....				\$ 81,000.00
Engineering and Administrative Costs (25%).....				\$ 20,000.00
R.O.W. and/or Easement Acquisition:.....				\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....				\$ 101,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT G-5: Spiketon Road from Ryan road to 649 Spiketon Road

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM	\$ 17,000.00	\$ 17,000.00
2	Trench Excavation Safety Systems	LUMP SUM	\$ 2,000.00	\$ 2,000.00
3	Erosion Control (2%)	LUMP SUM	\$ 3,000.00	\$ 3,000.00
4	Locate Existing Utilities (2%)	LUMP SUM	\$ 3,000.00	\$ 3,000.00
5	Solid Wall PVC Sanitary Sewer Pipe, 8 In. Diam.	900 LF	\$ 80.00	\$ 72,000.00
6	48" Sanitary Sewer Manhole	3 EA	\$ 5,000.00	\$ 15,000.00
7	Connections to Existing	1 EA	\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	30 LF	\$ 50.00	\$ 1,500.00
9	Gravel Backfill	1,540 TN	\$ 16.50	\$ 25,410.00
10	Foundation Gravel	100 TN	\$ 35.00	\$ 3,500.00
11	Cement Concrete Sidewalk Repair	230 SY	\$ 60.00	\$ 13,800.00
12	Asphalt Concrete Pavement Repair	30 TN	\$ 210.00	\$ 6,300.00
13	Cold Mix Asphalt	20 TN	\$ 200.00	\$ 4,000.00
14	Crushed Surfacing, Top Course	170 TN	\$ 35.00	\$ 5,950.00
15	Surface Restoration	70 SY	\$ 5.50	\$ 385.00
Subtotal:.....				\$ 175,345.00
Sales Tax (7.9%).....				\$ 13,852.26
Subtotal:.....				\$ 189,197.26
Contingency (20%):.....				\$ 37,802.75
TOTAL ESTIMATED CONSTRUCTION COST:.....				\$ 227,000.00
Engineering and Administrative Costs (25%):.....				\$ 57,000.00
R.O.W. and/or Easement Acquisition:.....				\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....				\$ 284,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT G-6: Alley between Naches St and Second St from Park Ave to Mason Ave

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM		\$ 20,000.00	\$ 20,000.00
2	Trench Excavation Safety Systems	LUMP SUM		\$ 2,000.00	\$ 2,000.00
3	Erosion Control (2%)	LUMP SUM		\$ 3,500.00	\$ 3,500.00
4	Locate Existing Utilities (2%)	LUMP SUM		\$ 3,500.00	\$ 3,500.00
5	Solid Wall PVC Sanitary Sewer Pipe, 8 In. Diam.	1,000 LF		\$ 80.00	\$ 80,000.00
6	48" Sanitary Sewer Manhole	4 EA		\$ 5,000.00	\$ 20,000.00
7	Connections to Existing	1 EA		\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	330 LF		\$ 50.00	\$ 16,500.00
9	Gravel Backfill	1,720 TN		\$ 16.50	\$ 28,380.00
10	Foundation Gravel	100 TN		\$ 35.00	\$ 3,500.00
11	Asphalt Concrete Pavement Repair	50 TN		\$ 210.00	\$ 10,500.00
12	Cold Mix Asphalt	20 TN		\$ 200.00	\$ 4,000.00
13	Crushed Surfacing, Top Course	180 TN		\$ 35.00	\$ 6,300.00
14	Surface Restoration	70 SY		\$ 5.50	\$ 385.00
Subtotal:.....					\$ 201,065.00
Sales Tax (7.9%):.....					\$ 15,884.14
Subtotal:.....					\$ 216,949.14
Contingency (20%):.....					\$ 43,050.86
TOTAL ESTIMATED CONSTRUCTION COST:.....					\$ 260,000.00
Engineering and Administrative Costs (25%):.....					\$ 65,000.00
R.O.W. and/or Easement Acquisition:.....					\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....					\$ 325,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT T-1: McNeely St south, east on Mason to State School Prop line, South to Ryan Road to Klink St

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u> <u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM	\$ 100,000.00	\$ 100,000.00
2	Trench Excavation Safety Systems	LUMP SUM	\$ 5,000.00	\$ 5,000.00
3	Erosion Control (2%)	LUMP SUM	\$ 17,500.00	\$ 17,500.00
4	Locate Existing Utilities (2%)	LUMP SUM	\$ 17,500.00	\$ 17,500.00
5	Solid Wall PVC Sanitary Sewer Pipe, 12 In. Diam.	4,800 LF	\$ 55.00	\$ 264,000.00
6	48" Sanitary Sewer Manhole	16 EA	\$ 5,000.00	\$ 80,000.00
7	Connections to Existing	1 EA	\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	- LF	\$ 50.00	\$ -
9	Gravel Backfill	25,900 TN	\$ 15.00	\$ 388,500.00
10	Foundation Gravel	1,000 TN	\$ 20.00	\$ 20,000.00
11	Asphalt Concrete Pavement Repair	360 TN	\$ 130.00	\$ 46,800.00
12	Cold Mix Asphalt	200 TN	\$ 130.00	\$ 26,000.00
13	Crushed Surfacing, Top Course	730 TN	\$ 25.00	\$ 18,250.00
14	Surface Restoration	4,060 SY	\$ 5.50	\$ 22,330.00
Subtotal:.....				\$ 1,008,380.00
Sales Tax (7.9%):.....				\$ 79,662.02
Subtotal:.....				\$ 1,088,042.02
Contingency (20%):.....				\$ 217,957.98
TOTAL ESTIMATED CONSTRUCTION COST:.....				\$ 1,306,000.00
Engineering and Administrative Costs (25%):.....				\$ 327,000.00
R.O.W. and/or Easement Acquisition:.....				\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....				\$ 1,633,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT F-1: South Spiketon Road Force Main

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM		\$ 15,000.00	\$ 15,000.00
2	Trench Excavation Safety Systems	LUMP SUM		\$ 1,000.00	\$ 1,000.00
3	Erosion Control (2%)	LUMP SUM		\$ 2,500.00	\$ 2,500.00
4	Locate Existing Utilities (2%)	LUMP SUM		\$ 2,500.00	\$ 2,500.00
5	Ductile Iron Sewer Force Main, 6 In. Diam.	1,300 LF		\$ 45.00	\$ 58,500.00
6	48" Sanitary Sewer Manhole	- EA		\$ 5,000.00	\$ -
7	Connections to Existing	1 EA		\$ 2,500.00	\$ 2,500.00
8	6" PVC Side Sewer Pipe	- LF		\$ 50.00	\$ -
9	Gravel Backfill	1,730 TN		\$ 16.50	\$ 28,545.00
10	Foundation Gravel	220 TN		\$ 35.00	\$ 7,700.00
11	Asphalt Concrete Pavement Repair	120 TN		\$ 210.00	\$ 25,200.00
12	Cold Mix Asphalt	20 TN		\$ 200.00	\$ 4,000.00
13	Crushed Surfacing, Top Course	220 TN		\$ 35.00	\$ 7,700.00
14	Surface Restoration	100 SY		\$ 5.50	\$ 550.00
Subtotal:.....					\$ 155,695.00
Sales Tax (7.9%):.....					\$ 12,299.91
Subtotal:.....					\$ 167,994.91
Contingency (20%):.....					\$ 34,005.10
TOTAL ESTIMATED CONSTRUCTION COST:.....					\$ 202,000.00
Engineering and Administrative Costs (25%):.....					\$ 51,000.00
R.O.W. and/or Easement Acquisition:.....					\$ -
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....					\$ 253,000.00

CITY OF BUCKLEY
PRELIMINARY COST ESTIMATE
PROJECT L-1: South Spiketon Road Lift Station

<u>NO.</u>	<u>ITEM</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>PRICE</u>	<u>AMOUNT</u>
1	Mobilization/Demobilization (10%)	LUMP SUM		\$ 15,000.00	\$ 15,000.00
2	Trench Excavation Safety Systems	LUMP SUM		\$ 5,000.00	\$ 5,000.00
3	Erosion Control (2%)	LUMP SUM		\$ 5,000.00	\$ 5,000.00
4	Locate Existing Utilities	LUMP SUM		\$ 1,000.00	\$ 1,000.00
5	Dewatering	LUMP SUM		\$ 10,000.00	\$ 10,000.00
6	Unsuitable Excavation	50 CY		\$ 40.00	\$ 2,000.00
7	500 gpm Lift Station and Related Improvements	LUMP SUM		\$ 340,000.00	\$ 340,000.00
8	Emergency Generator and Related Improvements	LUMP SUM		\$ 90,000.00	\$ 90,000.00
9	Gravel Backfill	400 TN		\$ 16.50	\$ 6,600.00
10	Foundation Gravel	100 TN		\$ 35.00	\$ 3,500.00
11	Asphalt Concrete Pavement Repair	100 TN		\$ 210.00	\$ 21,000.00
12	Cold Mix Asphalt	20 TN		\$ 200.00	\$ 4,000.00
13	Crushed Surfacing, Top Course	150 TN		\$ 35.00	\$ 5,250.00
14	Fencing and Gates	120 LF		\$ 70.00	\$ 8,400.00
Subtotal:.....					\$ 516,750.00
Sales Tax (7.9%).....					\$ 40,823.25
Subtotal:.....					\$ 557,573.25
Contingency (20%).....					\$ 111,426.75
TOTAL ESTIMATED CONSTRUCTION COST:.....					\$ 669,000.00
Engineering and Administrative Costs (25%).....					\$ 167,000.00
R.O.W. and/or Easement Acquisition:.....					\$ 30,000.00
TOTAL ESTIMATED PROJECT COST (2015 Dollars):.....					\$ 866,000.00

APPENDIX H

SEWER SYSTEM CONSTRUCTION STANDARDS

CITY OF BUCKLEY

PIERCE COUNTY

WASHINGTON



DEVELOPMENT GUIDELINES

AND

PUBLIC WORKS STANDARDS

REV. 5

**G&O #16204
FEBRUARY 2017**



Gray & Osborne, Inc.
CONSULTING ENGINEERS

CITY OF BUCKLEY

PIERCE COUNTY

WASHINGTON



DEVELOPMENT GUIDELINES

AND

PUBLIC WORKS STANDARDS

REV. 5

ADOPTED BY ORDINANCE NO.: 16-99

DATE: MAY 25TH, 1999

PREPARED BY: GRAY & OSBORNE, INC.

**701 DEXTER AVENUE NORTH, #200
SEATTLE, WASHINGTON 98109
G&O #16204**

REV 1 BY: CITY OF BUCKLEY PUBLIC WORKS AND FIRE DEPARTMENT

REV 2: ORDINANCE 20-04, SEPTEMBER 28, 2004

REV 3: ORDINANCE 05-08, FEBRUARY 26, 2008

REV 4: ORDINANCE 10-10, MAY 25, 2010

REV 5: ORDINANCE 02-17, JANUARY 24, 2017

SECTION 1
INTRODUCTION

SECTION 1**1. INTRODUCTION**

These standards shall apply to all improvements within the public right-of-way and/or public easements, to all improvements required within the proposed public right-of-way of new subdivisions, for all improvements intended for maintenance by the City and for all other improvements for which the City Code requires approval from the City Public Works Department. These standards are intended as guidelines for designers and developers in preparing their plans and for the City Public Works Department in reviewing plans. Where minimum values are stated, greater values should be used whenever practical; where maximum values are stated, lesser values should be used where practical.

Alternate design standards will be accepted when it can be shown, to the satisfaction of the City Public Works Department and City Engineer, that such alternate standards will provide a design equal to or superior to that specified. In evaluating the alternate design, the City Public Works Department and City Engineer shall consider appearance, durability, ease of maintenance, public safety and other appropriate factors.

Any improvements not specifically covered herein by these Standards must meet or exceed the most current edition of the Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge & Municipal Construction, State of Washington, and current amendments thereto, revised as to form to make reference to Local Governments. Said Specifications shall be referred to hereafter as the "WSDOT Standard Specifications."

Where improvements are not covered by these details or by the WSDOT Standard Specifications, the City Public Works Department and City Engineer will establish appropriate standards.

Plans for major improvements in the public right-of-way or within public easements shall bear an approval signature from the City and City Engineer.

The designer shall submit calculations or other appropriate materials supporting the design of utilities, pavements and storm drainage facilities. The designer shall submit calculations for structures and other designs when requested by the City Public Works Department and/or City Engineer.

SECTION 2

PERMITS

SECTION 2**2. PERMITS****2.01 Permit Process**

No person, firm or corporation shall commence work on the construction, alteration or repair of any facility located either in the public right-of-way or a public easement without any necessary permit(s) first having been obtained from the City.

Any party requesting such permit shall file a written application with the City at least ten (10) working days before construction is proposed to start.

Every application shall include information appropriate to the proposed use as specified in Buckley Municipal Code (BMC) 13.35.090. At a minimum the application shall include:

- (1) A scale drawing showing the following:
 - a) The location of the proposed right-of-way use;
 - b) The location of existing and proposed improvements;
 - c) The location of surface features such as curbs and gutters;
 - d) The location of underground features such as the location of utilities;
 - e) The location of the limits of the work area and method of restoration.
- (2) The name, address, email, telephone and facsimile number of the Applicant.
 - a) If the Applicant is not the Owner of the facility to be installed, maintained or repaired in the public right-of-way, the application shall also include the name, address, email, telephone and facsimile number of the Owner;
- (3) The proposed start date of the use or excavation.
- (4) The proposed duration of the use or excavation, which shall include the duration of the restoration of the public right-of-way physically disturbed by the excavation.

- a) The number of cubic yards to be excavated or filled;
 - b) Amount of impervious surface being added as defined by Chapter 14.30 BMC.
- (5) A copy or other documentation of the franchise, easement, encroachment permit, license or other legal instrument that authorizes the Applicant or owner to use or occupy the public right-of-way for the purpose described in the application.
 - (6) If the Applicant is not the Owner of the facility or facilities to be installed, maintained or repaired, the Applicant must demonstrate – in a form and manner specified by the director – his authorization to act on behalf of the Owner; Traffic Control Plan.
 - (7) An estimate of construction costs.
 - a) A draft bond form to be reviewed by the city (see BMC 13.35.220).
 - (8) An environmental checklist if required by the SEPA official.
 - (9) Any other information that may be reasonably required by the City Administrator and City Engineer based on the particular application at issue; and
 - (10) An application fee as required by BMC 13.35.120 or BMC 20.01.

The City Public Works Department may require, at their discretion, the filing of any other information when in their opinion such information is necessary to properly enforce the provisions of this ordinance.

No permit shall be issued until the proposed work has been approved by the appropriate official. Adjudication of disagreements regarding approvals shall be made by the City Administrator and his decision shall be final.

No plan shall be approved nor a permit issued where it appears that the proposed work, or any part thereof, conflicts with the provisions of this ordinance or any other ordinance of the City of Buckley, nor shall issuance of a permit be construed as a waiver of the Zoning Ordinance or other ordinance requirements concerning the plan.

2.02 Variances

A. General

The City Council or the City Administrator shall have the authority to grant a variance from the requirements of this Specification and from the requirements of this ordinance after considering the matter. The City Administrator and City Engineer may grant variances for minor modifications. Major modifications shall be referred to the City Council to sit in judgment of same, at a public meeting. Major modification as defined herein shall mean a modification or change to the Development Guidelines and Public Works Standards that is of such magnitude, complexity or sensitivity that final review and approval of a variance of a public works modification proposal is necessary by the City Council to ensure that potential impacts to the natural environment of the City are fully mitigated, and to protect the health, safety and general welfare of the community in a manner consistent with the municipal code and comprehensive plan. No application for a variance shall be granted by the council unless the council finds:

- (1) That special conditions and circumstances exist which are peculiar to the land such as size, shape, topography or location, not applicable to other lands in the same neighborhood, and that literal interpretation of the provisions of this ordinance would deprive the property owner of rights commonly enjoyed by other properties similarly situated in the same neighborhood.
- (2) That the special conditions and circumstances do not result from the actions of the applicant, and are not self-imposed hardships.
- (3) That granting the variance requested will not confer a special privilege to the subject property that is denied other lands in the same neighborhood.
- (4) That the granting of the variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the neighborhood in which the subject property is situated.
- (5) That the granting of the variance requested will be in harmony with the general purpose and intent of these standards, and any applicable Land Use Ordinance(s).
- (6) That the purpose of the variance is not merely to permit the subject property to be utilized more profitably by the owner or to economize on the cost of improving the property.

B. Conditions

In granting any variance of a major modification from a public works standard the City Council may prescribe appropriate conditions, mitigation and/or safeguards that will ensure that the purpose and intent of the specifications shall not be violated. Further, the City Council will require the applicant to post a performance bond guaranteeing compliance with such conditions.

C. Effective Date of Variance

The decision of the City Council granting or denying a major variance shall not become final until the expiration of ten days from the date of entry of such decision in the official records of the City Council.

D. Procedure for Application for a Variance

Application for a variance shall be filed with the City Public Works Department in writing.

SECTION 3

PUBLIC WORKS CONSIDERATIONS

SECTION 3

3. PUBLIC WORKS CONSIDERATIONS

3.01 Bonding

Developers and Contractors performing work within the public right-of-way or publicly owned easement(s) shall be prepared to satisfy the following two bonding requirements.

- A. Furnishing a performance bond, approved as to surety by the City Administrator and as to form by the City Attorney, which bond shall be conditioned upon faithful completion of that portion of the work performed pursuant to the permit which will require completion by the City should the permittee or his contractor default. The amount of such bond shall be 150 percent of the approved value of the improvements. The City engineer shall review and provide approval, as may be applicable of the submitted amount.
- B. Furnishing a Maintenance Bond. All work shall be guaranteed by the Contractor for a 2-year period from the time of inspection and final approval of the construction by the City.

3.02 Hold Harmless Clause

The Developer shall indemnify and hold harmless the City and the City Engineer, and their agents and employees, from and against all claims damages, losses, and expenses, including Attorney's fees, arising out of or resulting from the performance of the work, and shall, after reasonable notice, defend and pay the expense of defending any suit and will pay any judgment, provided that any such claim, damage, loss, or expense (1) is attributable to bodily injury, sickness, disease, or death, or to injury or destruction of tangible property (other than the work itself), including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission or by any other action giving rise to strict liability of the Developer, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

In any and all claims against the City or City Engineer, or any of their agents or employees, by any employee of the Developer, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this article shall not be limited in any way by any limitation on the amount or type of damages, compensation, or under workman's compensation acts, disability benefit acts, or other employee's benefit acts.

The obligations of the Developer under this article shall not include the sole negligence of the City or the City Engineer.

3.03 Developer's Public Liability and Property Damage Insurance

The Developer shall not commence work until he has furnished evidence (in duplicate copy) of insurance required hereunder, and such insurance has been approved by the City Attorney; nor shall the Developer allow any Contractor or subcontractor to commence work on his contract or subcontract until the same insurance requirements have been complied with by such Contractor or subcontractor. Approval of the insurance by the City Attorney shall not relieve or decrease the liability of the Developer thereby.

Companies writing the insurance under this article shall be licensed to do business in the State of Washington or be permitted to do business under the Surplus Line Law of the State of Washington.

The Developer shall maintain, during the life of the Contract, Comprehensive General and Automobile Liability Insurance, as detailed herein. The insurance shall include, as Additional Named Insured, the City. All insurance policies shall be endorsed to provide that the policy shall not be canceled or reduced in coverage until after ten (10) days prior written notice, as evidenced by return receipt of registered letter has been given to the City.

Comprehensive General Bodily Injury and Property Damage Insurance shall include:

- A. Premises and Operations.
- B. Developer's Protective Liability.
- C. Products Liability, including Completed Operations Coverage.
- D. Contractual Liability.
- E. Broad Form Property Damage.

Comprehensive Automobile Bodily Injury and Property Damage Insurance shall include:

- A. All owned automobiles.
- B. Non-owned automobiles.
- C. Hired automobiles.

The insurance coverages listed above shall protect the Developer from claims for damages for bodily injury, including death resulting therefrom, as well as claims for property damage, which may arise from operations under this contract, whether such operations be by himself or by any subcontractor or by anyone directly employed by either of them, it being understood that it is the Developer's obligation to enforce the requirements of this article as respects any Contractor or subcontractor.

Comprehensive General and Automobile Liability Insurance shall provide coverage for both bodily injury and property damage, as follows:

Comprehensive General and Automobile Bodily Injury Liability Insurance on an occurrence basis of not less than One Million dollars (\$1,000,000.00) for bodily injury, sickness or disease, including death resulting therefrom, sustained by each person; and for limits of not less than One Million Dollars (\$1,000,000.00) for each occurrence.

Comprehensive General Property Damage Liability Insurance on an occurrence as is for limits of not less than One Million Dollars (\$1,000,000.00) for damage to or destruction of property, including loss of use thereof, arising from each occurrence, and in an amount of not less than Two Million Dollars (\$2,000,000.00) in aggregate.

Comprehensive Automobile Property Damage Liability Insurance on an occurrence basis for limits of not less than One Million Dollars (\$1,000,000.00) for damage to or destruction of property, including loss of use thereof, arising from each occurrence.

Comprehensive Liability Insurance shall include the City and the as Additional Named Insured.

Comprehensive General Property Damage Liability Insurance shall include liability coverage for damage to or destruction of property of other, including loss of use of property damaged or destroyed, and all other indirect and consequential damage for which liability exists in connection with such damage to or destruction of property of others, and shall include coverage for:

("X") Injury to or destruction of any property arising out of blasting or explosion;

("C") Injury to or destruction of any property arising out of the collapse of/or structural injury to any building or structure due:

1. To excavation, including borrowing, filling or backfilling in connection therewith, or tunneling, pile driving, coffer-dam work or caisson work, or

2. To moving, shoring, underpinning, raising or demolition of any building or structure or removal or rebuilding of any structural support thereof.

("U") Injury to or destruction of wires, conduits, pipes, mains, sewers or other similar property or any apparatus in connection therewith, below the surface of the ground, if such injury or destruction is caused by and occurs during the use of mechanical equipment for the purpose of excavating or drilling, or

1. Injury to or destruction of property at any time resulting therefrom.

There shall be included in the liability insurance, contractual coverage sufficiently broad to insure the provisions of "Hold Harmless Clause."

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Developer's responsibility for payment of damages resulting from his operations under this Contract.

In the event the Developer is required to make corrections on the premises after the work has been inspected and accepted, he shall obtain, at his own expense, and prior to commencement of any corrective work, full insurance coverage, as specified herein.

The Developer shall furnish, upon request by the City, certified copies of the insurance policy or policies within two weeks of the City's request.

3.04 Compensation and Employer's Liability Insurance

The Developer shall maintain Workmen's Compensation Insurance or, as may be applicable, Maritime Workmen's Insurance, as required by state or federal statute for all of his employees to be engaged in work on the Project and, in case any such work is sublet, the Developer shall require the Contractor or subcontractor similarly to provide Workmen's Compensation Insurance or Maritime Workmen's Insurance for all of the latter's employees to be engaged in such work. The Developer's Labor & Industries account number shall be noted in the Proposal in the space provided.

In the event any class of employees engaged in work at the site of the Project is not covered under the Workmen's Compensation Insurance or Maritime Workmen's Insurance, as required by state and federal statute, the Developer shall maintain and shall cause each contractor or subcontractor to maintain Employer's Liability Insurance with a private insurance company for limits of at least One Hundred Thousand Dollars (\$100,000.00), each person, and Three Hundred Thousand Dollars (\$300,000.00), each accident, and furnish satisfactory evidence of same.

3.05 Non-Interference

The permittee shall be responsible for minimum interference with:

- A. Traffic Routing.
- B. Fire Facility Clearance.
- C. Adjoining Property.
- D. Utility Facilities.
- E. Natural Surface Drainage.

Prior to construction, these items are to be discussed with the City Public Works Department, and/or City Fire and Police Departments and/or the City Building Inspector, and special provisions may be included in any applicable City Permit(s).

3.06 Work Standards

All work performed pursuant to a permit issued shall be done in accordance with these "Development Guidelines and Public Works Standards" and WSDOT Standard Specifications. Where conflicts exist between these "Development Guidelines and Public Works Standards" and the aforementioned WSDOT Standard Specifications, the City's Development Standards shall take precedence. Natural Gas design and construction shall comply with standards and/or specifications as required by Puget Sound Energy.

3.07 Inspection

- A. General. The City shall exercise full right of inspection of all excavating, construction, and other invasions of City right-of-way or public easements. The City Public Works Department shall be notified on the working day prior to commencing any work in the City's right-of-way or public easements. The City Public Works Department and/or City Engineer is authorized to and may issue immediate stop work orders in the event of noncompliance with this chapter and/or any of the terms and provisions of the permit or permits issued hereunder.
- B. Final Inspection. Prior to final approval of construction, a visual inspection of the job site will be made by the City Public Works Department. Restoration of the area shall be complete with all improvements being restored to substantially their original or superior condition. Final approval of construction shall not be given earlier than

thirty (30) days after completion of construction, as witnessed by the City's Public Works Department and/or City Engineer.

3.08 As-built Drawings

Permittees who install systems within, on, or below the City's public rights-of-way or public easements shall furnish the City Public Works Department with accurate drawings, plans and profiles, showing the location and curvature of all underground structures installed, including abandoned installations. Horizontal locations of utilities are to be referenced to street centerlines, as marked by survey monuments, and shall be accurate to a tolerance of plus or minus 1/2 foot. The depth of such structure may be referenced to the elevation of the finished street above said utility, with depths to the nearest one-tenth foot being shown in a minimum of 50-foot intervals along the location of said utility. All development improvements including private service for sewer, water, storm drainage and gas, shall be marked where they intersect the curb with metal tags embedded in the curb face.

Such as-built drawings shall be submitted to the City Public Works Department office within thirty (30) calendar days after completion of the work.

In the event that the permittee does not have qualified personnel to furnish the as-built drawing required by this section, he shall advise the City Public Works Department in order that necessary field measurement may be taken during construction for the preparation of as-built drawings. All costs of such field inspection and measurement, to include the preparation of the as-built drawings, shall be at the sole expense of the permittee.

Drawing Standards:

Minimum scale - 1" = 50' horizontal; 1" = 5' vertical

Detail scale - Larger as necessary

As-built drawings shall be submitted on permanent, stable reproducible Mylar with a signature and data which verifies the "as-built" condition of the project. All data as shown on the drawings shall be "fixed line" or ink. Sticky back (glue) reproductions or "sepia" Mylars will not be acceptable. In addition, as built drawings shall be provided in electronic form compatible with the CAD system used by the City Engineer. The Applicant shall contact the City Engineer to determine which version of CAD is being used by the City.

SECTION 6

SANITARY SEWER STANDARDS

SECTION 6**6. SANITARY SEWER STANDARDS****6.01 General**

The standards established by this chapter are intended to represent the *minimum* standards for the design and construction of sanitary sewer facilities. Greater or lesser requirements may be mandated by the City due to localized conditions. Where gravity service can be reasonably provided, it shall be so provided. Where gravity service cannot be reasonably provided, low pressure sewer systems may be approved by the City due to special circumstances, as approved by the City Council. Such systems shall be designed and constructed to City Standards as approved by the City Engineer. The following design and construction considerations shall apply:

6.02 Design Standards

The design of sanitary sewer systems shall be dependent on local site conditions. The design elements of sanitary sewer systems shall conform to minimum City Standards set forth herein and follow design guidelines as further set forth in the Department of Ecology's "Criteria for Sewage Design" manual.

- A. Detailed plans shall be submitted for the City's review, which provide the location, size, type and direction of flow of the proposed sewers and the connection with existing sewers. These plans shall be separate from water plans.
- B. Project plans should have a horizontal scale of not more than 50 feet to the inch and a vertical scale of not more than 5 feet to the inch. Plan views shall be drawn to a corresponding horizontal scale. Plans and profiles shall show:
 - 1. Locations of streets, right-of-ways, existing utilities, and sewers.
 - 2. Ground surface, pipe type, class and size, manhole stationing, invert and surface elevation at each manhole, and grade of sewer between adjacent manholes. All manholes shall be numbered on the plans and correspondingly numbered on the profile. Where there is any question of the sewer being sufficiently deep to serve any residence, the elevation and location of the basement floor, if basements are served, shall be plotted on the profile of the sewer which is to serve the house in question. The Developer shall state that all sewers are sufficiently deep to serve adjacent basements, except where otherwise noted on the plans. Minimum floor

elevations of structures shall be noted for each lot being provided sewer service.

3. All known existing structures, both above and below ground, which might interfere with the proposed construction, particularly water mains, gas mains, storm drains, overhead and underground power lines, telephones lines, and television cables.
 4. All utility easements.
 5. Details in scale drawings which clearly show special sewer joints and cross-sections, and sewer appurtenances such as manholes and related items.
- C. Construction of new sewer systems or extensions of existing systems will be allowed only if the existing receiving system is capable of supporting the added hydraulic load.
 - D. Collection and interceptor sewers shall be designed for the ultimate development of the tributary areas.
 - E. Sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of infiltration and inflow.
 - F. Computations and other data used for design of the sewer system shall be submitted to the City for approval.
 - G. The sewage facilities shall be constructed in conformance with the WSDOT Standard Specifications and as modified by any special City requirements and standards.
 - H. Material and installation specifications shall contain appropriate requirements that have been established by the industry in its technical publications, such as ASTM, AWWA, WPCF, and APWA Standards. Requirements shall be set forth in the specifications for the pipe and methods of bedding and backfilling so as not to damage the pipe or its joints, impede cleaning operations and future tapping, nor create excessive side fill pressure or ovalation of the pipe, nor seriously impair flow capacity.
 - I. All sewers shall be designed to prevent damage from superimposed loads. Proper allowance for loads on the sewer because of the width and depth of trench should be made. When standard-strength sewer pipe is not sufficient, extra-strength pipe shall be used.

- J. Prior to acceptance and approval of construction, the following tests shall apply to each type of construction.

1. Gravity Sewer

- (1) Prior to acceptance of the project, the gravity sewer pipe shall be subject to a low pressure air test per WSDOT/APWA Standards. The Contractor shall furnish all equipment and personnel for conducting the test under the observation of the City Inspector. The testing equipment shall be subject to the approval of the City. The Contractor shall provide a minimum of two complete sets of test gear to test two sections of pipe manhole to manhole at the same time. The Contractor shall perform an air pre-test prior to notifying the City to schedule the actual test. The acceptance air test shall be made after trench is back filled and compacted and the roadway section is completed to sub grade.

All wyes, tees, and end of side sewer stubs shall be plugged with flexible joint caps, or acceptable alternates, securely fastened to withstand the internal test pressures. Such plugs or caps shall be readily removable and their removal shall provide a socket suitable for making a flexible jointed lateral connection or extension.

- (2) Testing of the sewer main shall include a television inspection by the Contractor. The camera shall be equipped with a rotating head to allow televising of the side sewers as mainline inspection is occurring. The camera unit shall be equipped with a measuring device that is in plain view ahead of the camera. The device shall be 1-inch in diameter and on a flexible shaft. Television inspection shall be done after the WSDOT low pressure air test #7-17.3(2) F has passed, the pipe line cleaned and before the roadway is paved. Immediately prior to a television inspection enough water shall be run down the line so it comes out the lower manhole, unless televising is done right after the cleaning has taken place. A copy of the video tape and written report shall be submitted to the City. Acceptance of the line will be made after the tape has been reviewed and approved by the inspector. Any tap to an existing system needs to be televised as well. Televising

shall start at the closest manhole to the tap and extend
15 feet beyond the tap.

- K. A mandrel test in accordance with Section 7-17.3 (2)G of the WSDOT/APWA Standard Specifications shall be required on all sewers except laterals as defined in these standards as directed by the City.
- L. At all times during the televised inspection process, the City's Utility Superintendent or a designated representative shall be present. The City's Public Works Department shall be notified forty-eight (48) hours prior to any televised inspection.
- M. After all other work is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross sections for a new roadway consistent with the original section.
- N. The Developer shall be required, upon completion of the work and prior to acceptance by the City, to furnish the City with a written guarantee covering all material and workmanship for a period of 2 years after the date of final acceptance and the Developer shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as the result of furnishing poor materials and/or workmanship. The Developer shall obtain warranties from the Contractors, subcontractors and suppliers of material or equipment where such warranties are required, and shall deliver copies to the City upon completion of the work.

6.03 General Requirements

- 1. Prior to construction, the sewer plans shall be reviewed and approved by the Department of Ecology (if specifically requested by the City) and an affidavit stating such are on file at the City's Public Works Department.
- 2. Prior to construction, the Contractor shall notify the City for a preconstruction meeting.
- 3. Work shall be performed only by licensed and bonded Contractors with a demonstrated experience in laying public sewer mains of the type being proposed for construction.
- 4. Prior to any work being performed, the Contractor shall contact the City's Utility Superintendent or City Engineer to set forth his proposed schedule.

5. Contractor shall obtain approval of materials to be used from the City's Public Works Department prior to ordering of materials.
6. Sewer main shall be laid only in dedicated streets or in easements which have been exclusively granted to the City. A street is normally not officially recognized until the plat which created it has been filed (recorded) with the County Auditor.
7. The sewer main shall run parallel to and 5 feet southerly or westerly of street centerline where possible. The sewer main shall maintain a minimum 10 foot horizontal separation from proposed or existing water mains.
8. The maximum distance between manholes shall be 400 feet unless specifically approved otherwise by the City Public Works Department.
9. PVC pipe shall be a minimum Class S.D.R. 35 and be manufactured in accordance with ASTM D3034. Ductile iron pipe shall be Class 52 conforming to AWWA C151 and C104.
10. The allowable cover (finished grade) for the various types of pipe are:

PVC Pipe:	3' to 25'
D.I. Pipe (CL 52):	<3' (if allowed)
	25' and above
	Slopes of 18 percent or greater

All pipe shall have a minimum of 36 inches of cover (18" in the case of a side sewer on private property). The City reserves the right to require a minimum of 3 feet of cover unless topography, existing facilities or other future improvements prohibit this minimum cover for installation.

11. The minimum slope for 8" gravity mains shall be 0.5 percent (except the minimum slope for dead end runs shall be 1.0 percent for 8" gravity mains) and the minimum slope for 6" side sewer laterals shall be 2.0 percent.
12. All side sewer laterals shall be of the same material as the main line.
13. Each side sewer lateral shall be equipped with a 6" x 6" tee or wye (see detail), with an approved water-tight cap (adequately secured to facilitate pressure testing), located adjacent to, but within, the public right-of-way, to be utilized as a clean-out.

14. Each side sewer lateral shall have an approved water-tight cap at the termination of the stub; it shall be adequately "blocked" to satisfactorily resist the air pressure testing.
15. Each side sewer lateral shall have a 12 foot long 2" x 4" wood "marker" at the termination of the stub. The "marker" shall extend from the bottom of the trench to above finished grade. Above the ground surface, it shall be painted "white" with "S/S" and the depth, in feet, stenciled in black letters 2" high.
16. Front lot corners shall be staked prior to construction for side sewer tee location.
17. All side sewers shall be extended to the lowest property corner and located a minimum of 10 feet from the side lot line and extend a minimum of 10 feet past the street right-of-way line (or property line).
18. Side sewer connections if allowed directly into manholes shall be constructed to match the sewer main crown (outlet) and the manhole channeled accordingly.
19. All lots shall be serviced with its own individual side sewer.
20. Terminating manholes, where sewer extension may occur, shall be provided with knock-outs and channeled accordingly.
21. Manholes shall be provided with a 0.10 foot drop across the channel.
22. Locking lids shall be provided for all manholes and all manhole lids shall have the word "sewer" cast integrally onto its surface.
23. Concrete collars shall be placed around all frames per the Standard Detail for manholes as noted herein.
24. Pipe connections to manholes shall be as follows:
 - PVC Pipe: Cast or grout a watertight manhole coupling (see detail) into manhole wall.
 - Pipe: Bell and spigot joint or flexible coupling; either shall be 12" maximum distance from manhole wall.
 - PVC and D.I. pipe, optional: Core the manhole and connect sewer pipe with a water-tight flexible rubber boot in manhole wall, Kor-N-Seal boot, or equal.

25. Provide the City's Engineer and Utility Superintendent a copy of the cut sheets prior to construction.
26. Pipe trenches shall not be backfilled until pipe and bedding installation has been inspected and approved by the City's Inspector.
27. Manhole rim and invert elevations shall be field verified after construction by the Developer's engineer(s) and the "as constructed" drawings individually stamped by a Washington State licensed professional engineer which shall attest to the fact that the information is correct.

6.04 Materials and Testing

A. Sewer Mains, Laterals, and Force Mains

Sewer mains to be installed shall be of material noted below:

Gravity Sewer and Laterals:

PVC Pipe:	3'-25' Cover
DI Pipe (Class 52):	<3' Cover (if allowed)
	25' and Over
	Slopes of 18 percent or greater

Force Main:	DI Pipe Class 52
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PVC pipe shall be a minimum Class S.D.R. 35 and be manufactured in accordance with ASTM D3034. The pipe and fittings shall be furnished with bells and spigots which are integral with the pipe wall. Pipe joints shall use flexible elastomeric gaskets conforming to ASTM D3212. Nominal laying lengths shall be 20 feet and 13 feet.

The ductile iron pipe shall conform to ANSI/AWWA C151/A21.51-91 Standards, and current amendments thereto, except the ductile iron pipe shall be thickness Class 52 for gravity sewers and Class 52 for force mains. Grade of iron shall be a minimum of 60-42-10. The pipe shall be cement lined to a minimum thickness of 1/16", and the exterior shall be coated with an asphaltic coating. Each length shall be plainly marked with the manufacturer's identification, year case, thickness, class of pipe and weight.

Type of joint shall be mechanical joint or push-on type, employing a single gasket, such as "Tyton", except where otherwise calling for flanged ends.

Bolts furnished for mechanical joint pipe and fittings shall be high strength ductile iron, with a minimum tensile strength of 50,000 psi.

Restrained joint pipe, where shown on the Plans shall be push-on joint pipe with "Field Lok" gaskets as furnished by U.S. Pipe or equal for 12-inch diameter and smaller pipe and "TR FLEX" as furnished by U.S. Pipe or equal for 16-inch and 24-inch diameter pipes. The restrained joint pipe shall meet all other requirements of the non-restrained pipe.

All pipe shall be jointed by the manufacturer's standard coupling, be all of one manufacturer, be carefully installed in complete compliance with the manufacturer's recommendations.

All fittings shall be short-bodied, ductile iron complying with applicable ANSI/AWWA C110 or C153 Standards for 350 psi pressure rating for mechanical joint fittings and 250 psi pressure rating for flanged fittings. All fittings shall be cement lined and either mechanical joint or flanged, as indicated on the Plans.

Fittings in areas shown on the Plans for restrained joints shall be mechanical joint fittings with a mechanical joint restraint device. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG, or ROMAC "Grip Ring," as approved by the City Water Manager (Utilities Superintendent).

All couplings shall be ductile iron mechanical joint sleeves.

The sewer pipe, unless otherwise approved by the City and/or Engineer, shall be laid upgrade from point of connection on the existing sewer or from a designated starting point. The sewer pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug. Wherever movable shoring (steel box) is used in the ditch, pipe shall be restrained by use of a winch mounted in the downstream manhole and a line of sufficient strength threaded through the pipe and set tight before each move. Any indication that joints are not being held shall be sufficient reason for the City to require restraints, whether or not movable shoring is being used.

All pipe shall be laid in straight lines and at uniform rate of grade between manholes. Variance from established line and grade shall not be greater than 1/2-inch, provided that such variation does not result in a level of reverse sloping invert; provided, also, that variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of joining surface

and pipe interior surfaces, does not exceed 1/64-inch per inch of pipe diameter, or 1/2-inch maximum. Any corrections required in line and grade shall be reviewed with the City Utility Superintendent and/or City Engineer and shall be made at the expense of the Developer and/or Contractor.

All extensions, additions and revisions to the sewer system, unless otherwise indicated, shall be made with sewer pipe jointed by means of a flexible gasket which shall be fabricated and installed in accordance with the manufacturer's specifications.

All joints shall be made up in strict compliance with the manufacturer's recommendations and all sewer pipe manufacture and handling shall meet or exceed the ASTM and APWA recommended specifications, current revisions.

Pipe handling after the gasket has been affixed shall be carefully controlled to avoid disturbing the gasket and knocking it out of position, or loading it with dirt or other foreign material. Any gaskets so disturbed shall be removed, cleaned, relubricated if required, and replaced before the rejoining is attempted.

Care shall be taken to properly align the pipe before joints are entirely forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Since most flexible gasketed joints tend to creep apart when the end pipe is deflected and straightened, such movement shall be held to a minimum once the joint is home.

Sufficient pressure shall be applied in making the joint to assure that it is home, as described in the installation instructions provided by the pipe manufacturer. Sufficient restraint shall be applied to the line to assure that joints once home are held so, until fill material under and alongside the pipe has been sufficiently compacted. At the end of the work day, the last pipe laid shall be blocked in an effective way to prevent creep during "down time."

For the joining of dissimilar pipes suitable adapter couplings shall be used which have been approved by the City Utility Superintendent and/or the Engineer.

All gravity sewer pipe shall be bedded with pea gravel. The PVC pipe shall be bedded from a depth of 4 inches below the pipe to 12 inches above the pipe and ductile iron gravity sewer pipe shall be bedded from a

depth of 4 inches below the pipe to the springline of the pipe. The bedding material shall extend across the full width of the trench and shall be compacted under the haunches of the pipe.

Special concrete bedding shall consist of a pipe cradle constructed of Portland cement concrete containing not less than four sacks of cement per cubic yard. Sand, gravel and water proportions are subject to approval by the Engineer. Maximum aggregate size shall be 1-1/2-inch. Maximum slump shall be 4-inch. The bottom of the trench shall be fully compacted before the placement of pipe cradle. The Contractor shall protect pipe against flotation and disturbing the horizontal alignment of the pipe during the pouring of the concrete. WSDOT Standard Specifications for "Class A" concrete bedding will be acceptable.

Clay or Bentonite dams shall be installed across the trench and to the full depth of the granular material in all areas of steep slopes, stream crossings and wetland to prevent migration of water along the pipeline.

All backfill shall be placed and compacted in accordance with City, County, or State requirements as may be applicable and copies of the compaction results shall be provided to the City Engineer.

B. Manholes

Manholes shall be of the offset type and shall be precast concrete sections with either a cast in place base, or a precast base made from a 3,000 psi structural concrete. Joints between precast wall sections shall be confined O-ring or as otherwise specified. Pre-channeled manholes are not acceptable.

For connections to existing systems, a concrete coring machine, suitable for this type of work, shall be utilized in making the connection. The existing manhole shall be rechanneled as required. The new pipe connection shall be plugged (water tight) until the new pipe system has been installed and approved. The Contractor shall be responsible for any existing defects in the existing manhole unless these defects are witnessed by a representative of the City prior to any work being performed to make the connection. The Contractor shall be required to remove any and all deleterious material in the existing manhole and downstream reaches as a result of his/her work.

1. Manhole Sections

Manhole sections shall be placed and aligned so as to provide vertical sides and vertical alignment of the ladder steps. The completed manhole shall be rigid, true to dimension, and be water tight. Rough, uneven surfaces will not be permitted.

The mortar used between the joints in the precast sections and for laying manhole adjusting bricks shall be composed of one part cement to two parts of plaster sand. All joints shall be thoroughly wetted and completely filled with mortar, smoothed both inside and outside to insure water tightness.

Masonry units (manhole adjusting brick) shall conform to the ASTM C-32, Grade MA. The outside and inside of manhole adjusting bricks and the joints of precast concrete sections shall be plastered and troweled smooth with 1/2-inch (minimum) of mortar in order to attain a watertight surface.

2. Manhole Steps

Manhole steps shall be polypropylene, Lane International Corp. No. P13938, or equal. Ladders (maximum 3 foot length) shall be polypropylene Lane International Corp., or equal, and shall be compatible with steps.

3. Grade Adjustment

Where work is located in public right-of-way, not less than 18" or more than 26" shall be provided between the top of the cone or slab and the top of the manhole frame.

4. Channels

Channels shall be made to conform accurately to the sewer grade and shall be brought together smoothly with well rounded junctions, satisfactory to the City Utilities Superintendent and/or the City Engineer. The channels shall be field poured after the inlet and outlet pipes have been laid and firmly grouted into place at the proper elevation. Allowances shall be made for a 0.1 foot drop in elevation across the manhole in the direction of flow. Channel sides shall be carried up vertically from the invert to three-quarters of the diameter of the various pipes. The concrete shelf shall be warped evenly and sloped 3/8" per foot to drain. Rough, uneven surfaces will not be permitted. Channels shall be

constructed to allow the installation and use of a mechanical plug or flow meter of the appropriate size.

5. Drop Manholes

Drop manholes shall, in all respects, be constructed as a standard manhole with the exception of the drop connection.

6. Lift Holes and Steel Loops

All lift holes shall be completely filled with expanding mortar, smoothed both inside and outside, to insure water tightness. All steel loops shall be removed, flush with the manhole wall. The stubs shall be covered with mortar and smoothed. Rough, uneven surfaces will not be permitted.

7. Frames and Covers

Frames and covers shall be ductile iron. Castings shall be free of porosity, shrink cavities, cold shuts or cracks, or any surface defects which would impair serviceability. Repair of defects by welding, or by the use of "smooth-on" or similar material, will not be permitted. Frames and covers shall be machine finished or ground on seating surfaces so as to assure non-rocking fit in any position and interchangeability of covers. Frames and covers shall be provided with three bolt locking lids. Rings and covers shall be positioned so one of the three locking bolts is located over the manhole steps and shall be adjusted to conform to the final finished surface grade of the street or easement to the satisfaction of the City or agent for the City. Manhole frames and covers shall be as manufactured by "Sather" Manufacturing Company, Model No. 6024-R, or City approved equal.

C. Side Sewer Lateral

A side sewer lateral is considered to be that portion of a sewer line that will be constructed between a main sewer line and a property line or easement limit line.

All applicable specifications given herein for sewer construction shall be held to apply to side sewer laterals.

Side sewers shall be for a single connection only and be a minimum 6-inch diameter pipe. Side sewers shall be connected to the tee, provided in the sewer main where such is available, utilizing approved fittings or adapters.

The side sewer shall rise at a maximum of 45° and a minimum of 2 percent, from the sewer main.

Where there are no basements, the minimum side sewer depth shall be 6 feet below existing curb line and 5 feet below ground at the property line where possible, except where existing improvements, proposed improvements or topography may dictate additional depth. The elevations of the side sewer connections shall be of sufficient depth to serve all existing and potential future basements.

The Contractor shall provide for each 6-inch side sewer service a 12 foot long 2" x 4" wooden post which extends from the invert of the end of the 6-inch pipe to above the existing ground. The exposed area of this post shall be painted white and shall have selected thereon in 2-inch letters (black paint) "S/S" and shall also indicate the depth of the sewer service stub from finished grade.

Where no tee or wye is provided or available, connection shall be made by machine-made tap and saddle, only with specific written authorization of the City. The City shall review the exact location and material, list in its evaluation.

The maximum bend permissible at any one fitting shall not exceed 45°. The maximum bend of any combination of two adjacent fittings shall not exceed 45° (one-eighth bend) unless straight pipe of not less than 3 feet in length is installed between such adjacent fittings, or unless one of the fittings is a wye branch with a cleanout provided on the straight leg.

D. Private Side Sewers

Private side sewers are the extension of side sewer laterals located outside of the public rights-of-way or easements granted to the City of Buckley.

1. Side sewer pipe located on private property shall be 4-inch (larger if specifically approved by the City), ductile iron or PVC ASTM D-3034, and shall be installed at 2 percent minimum grade (1/4 inch fall per foot). Construction on private property may be performed by Owner, but requires a permit.
2. Pipe shall be bedded with pea gravel or clean free draining sand.
3. 6- inch sewer pipe is required in the street right-of-way and shall have a 2 percent minimum grade. Construction in street rights-of-way shall be performed by a licensed side sewer contractor and requires a permit.

4. Side sewer shall be inspected by the City's Representative/Inspector prior to backfilling. Side sewer shall be plugged and tested in the presence of the City Inspector by filling with water. Leakage rate shall not exceed 0.31 gal./hr. for 4-inch pipe and 0.47 gal./hr. for 6-inch pipe, per 100 feet of pipe.
5. On private property, minimum cover shall be 18-inch over top of pipe from the point which is 30-inch out from house and continuing to the connection with the City's sewer system.
6. Parallel water and sewer lines shall be 10 feet apart horizontally wherever possible and have a vertical separation of 18-inch if a vertical crossing is necessary.
7. No more than 100 feet is allowed between cleanouts. Cleanouts are required for bends equal to or greater than 45°. Cleanout shall be a watertight plugged gasketed tee or wye lateral.
8. All pipe joints shall be rubber gasket type.
9. Provide "grease trap" of a size and type approved by the City at all such locations as may be deemed necessary by the City.

E. Testing Gravity Sewers for Acceptance

The Contractor and/or Developer shall furnish all facilities and personnel for conducting tests under the observation of the City Engineer or City Utilities Superintendent. Methods other than Part "B" shall be subject to the approval of the City Administrator and/or City Engineer.

1. Preparation for Testing for Leakage

The Contractor and/or Developer shall be required, prior to testing, to clean and flush all gravity sewer lines. The completed gravity sewer, including side sewer stubs, after completion of backfill and cleaning shall be televised inspected. This will be permitted prior to paving. The sewer shall then be tested by the low pressure air test method and/or an infiltration test. Except, however, that in certain conditions an exfiltration test may be required by the City Utilities Superintendent and/or City Engineer.

The first section of pipe not less than 300 feet in length installed by each crew shall be tested, in order to qualify the crew and/or the material. A successful installation of this first section shall be a

prerequisite to further pipe installation by the crew. At the Contractor's option, crew and/or material qualification testing may be performed at any time during the construction process after at least 2 feet of backfill has been placed over the pipe.

The cleaning shall be carried out in such a manner to not infiltrate existing facilities. Precautions shall be taken to prevent any damage caused by cleaning and testing. Any damage resulting shall be repaired by the Contractor and/or Developer at his own expense. The manner and time of testing shall be subject to approval of the City Utilities Superintendent and/or the City Engineer.

2. Low Pressure Air Test

The sewer pipe shall be tested for leaks through the use of air (unless method "C" and "D" are approved) in the following manner:

Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease from 3.5 to 2.5 pounds per square inch greater than the pipe section's average adjacent groundwater back pressure.

The pipeline shall be considered acceptable, when tested at an average pressure of 3.0 pounds per square inch greater than the pipe section's adjacent groundwater back pressure if the total rate of air loss from any section tested in its entirety between manholes, cleanouts or pipe ends does not exceed the following table:

SANITARY SEWER STANDARDS

Length of 6-Inch Pipe (ft)

	0	50	100	150	200	250	300	350	400
0	0	0:40	1:20	1:58	2:38	3:18	3:58	4:38	5:16
50	1:10	1:50	2:30	3:10	3:48	4:28	5:08	5:48	5:56
100	2:20	3:00	3:40	4:20	5:00	5:38	6:14	6:12	6:08
150	3:32	4:10	4:50	5:30	6:10	6:30	6:26	6:22	6:18
200	4:42	5:22	6:00	6:40	6:44	6:38	6:34	6:30	6:26
250	5:52	6:32	6:48	6:58	6:50	6:44	6:40	6:36	6:32
300	7:02	7:20	7:10	7:02	6:56	6:50	6:44	6:40	6:36
350	7:34	7:22	7:14	7:06	7:00	6:54	6:50	6:44	6:42
400	7:34	7:24	7:16	7:08	7:02	6:58	6:52	6:48	6:44

Test time in minutes and seconds

Test times will be provided by the City Engineer upon request for combinations other than 8-inch mains and 6-inch laterals.

If the pipe installation fails to meet these requirements, the Developer and/or Contractor shall determine at his own expense the source or sources of leakage, and he shall repair (if the extent and type of repairs proposed by the Developer and/or Contractor appear reasonable to the City Utility Superintendent and/or City Engineer) or replace all defective materials or workmanship. The completed pipe installation shall meet the requirements of this low pressure air test or the alternative water exfiltration test before being considered for acceptance.

Plugs used to close the sewer pipe for the air test shall be securely braced to prevent the unintentional release of a plug which can become a high velocity projectile. Gauges, air piping manifolds and valves shall be located at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure. Air testing apparatus shall be equipped with a pressure release device such as a rupture disk or a pressure relief valve designed to relieve pressure on the pipe under test at 6 psi.

3. Exfiltration Test (if approved by City)

All pipe shall be cleaned before the exfiltration test. Prior to making exfiltration leakage tests, the Developer and/or Contractor may fill the pipe with clear water to permit normal absorption into the pipe walls; provided however, that after so filling the pipe he shall complete the leakage test within 24 hours after filling. When

under test, the leakage allowable shall comply with the provisions that follow:

Leakage shall be no more than 0.15 gallons per hour per inch of diameter per 100 feet of sewer pipe, with a minimum test pressure of 6 feet of water column above the crown at the upper end of the pipe or above the active groundwater table, whichever is higher as determined by the City. The length of pipe tested shall be limited so that the pressure on the invert of the lower end of the section tested shall not exceed 16 feet of water column. For each increase in pressure of 2 feet above a basic 6 feet measured above the crown at the lower end of the test station, the allowable leakage shall be increased by 10 percent.

The Developer and/or Contractor shall furnish all equipment, materials, and labor necessary for making test. The equipment shall be to the approval of the City Utilities Superintendent and/or City Engineer. The manner and time of testing shall be subject to approval of the City Utilities Superintendent and/or City Engineer. It shall be the Developer's and/or Contractor's responsibility to determine the level of the water table at each manhole. If leakage exceeds the allowable amount, corrective measures shall be taken and the line then be retested to the satisfaction of the City's designated inspector.

4. Infiltration Test (if approved by City)

Infiltration testing shall take place during jetting of backfill, except when the natural groundwater table is above the crown of the higher end of the test section. The maximum allowable limit for infiltration shall be 0.15 gallon per hour per inch of internal diameter per 100 feet of length with no allowance for external hydrostatic head.

5. Deflection Test

Deflection tests shall be performed on all PVC gravity sewer mains by pulling a mandrel through the pipe and the deflection test limit shall be 5.0 percent of the base inside diameter or for example 7.28 inches for 8-inch diameter pipe. The sewer lines shall be thoroughly cleaned prior to the deflection test.

F. Testing Force Main**1. Test Specifications**

All force mains shall be tested prior to acceptance of work. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Contractor. Feed for the pump shall be from a barrel or other container within the actual amount of "makeup" water, so that it can be measured periodically during the test period.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All thrust blocks shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking.

The pipeline shall be subjected to a pressure and leakage test of a minimum of 150 pounds per square inch for a period of not less than 1 hour. The test pressure shall be applied at the low end of the section tested.

The quantity of water lost from the main shall not exceed the number of gallons per hour determined by the formula:

$$L = \frac{ND(P)^{0.5}}{7,400}$$

in which

L = Allowable leakage, gallons/hour

N = Number of joints in the length of pipeline tested

D = Nominal diameter of the pipe in inches

P = Average test pressure during the leakage test, psi

Defective materials or workmanship, discovered as a result of the tests, shall be replaced by the Contractor at the Contractor's expense. Whenever it is necessary to replace defective material or correct the workmanship, the tests shall be re-run at the Contractor's expense until a satisfactory test is obtained.

2. Preliminary Tests

Developer and/or Contractor shall conduct preliminary tests and assure himself/herself that the section to be tested is in an acceptable condition before requesting the City Utilities Superintendent and/or City Engineer to witness the test.

3. Thrust Blocks and Anchor Blocks

All fittings shall be blocked with concrete in order to prevent movement and separation of pipe joints. Timber will not be permitted as permanent blocking. Sufficient time shall be allowed for concrete to set before commencement of pressure tests. The type and size of blocks and anchors shall be as detailed herein. A visqueen barrier shall be provided to protect glands, bolts, and other miscellaneous materials required for this type of connection from the concrete.

6.05 Video Recording

Upon completion, the Developer shall require that the sewer lines be internally televised and recorded. A DVD or CD together with a written log of the television inspection shall be submitted to the City for their review and approval, and if accepted, be retained in their files. This work can be performed prior to paving. The City's inspector shall be notified of the date of TV inspection to insure his availability during this time.

6.06 State Highway Crossings

All state highway and stream crossings shall be encased with a steel casing or ductile iron or PVC sleeve, as approved by the City and prevailing regulatory agencies. The steel casing or sleeve shall be of sufficient diameter, size and strength to enclose the sewer pipe and to withstand maximum highway loading. Sizing and wall thickness of casing is subject to approval by the City Engineer. Sand backfill or grout fill between the casing and the sewer pipe shall be required. In order to prevent the sand from being washed from the casing the ends of the casing shall be bricked and cemented after installation, backfill and testing of the pipe are completed.

6.07 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing or performing such work shall be currently licensed by the State of Washington to perform said tasks.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of sanitary sewer systems shall be as follows:

- A. Stake centerline alignment at a minimum of 50 foot intervals unless otherwise approved by the City.
- B. Stake location of all manholes and side sewer laterals for grade and alignment.
- C. Provide a copy of "cut sheets" to City inspector.
- D. Stake finished manhole rim elevation and invert elevations of all pipes in manholes.

6.08 Trench Excavation

- A. Clearing and grubbing where required shall be performed within the easement or public right-of-way as permitted by the City and/or governing agencies. Debris resulting from the clearing and grubbing shall be disposed of by the owner or contractor in accordance with the terms of all applicable permits.
- B. Trenches shall be excavated to the line and depth designated by the City to provide a City approved minimum of cover over the pipe. See Details as applicable. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency and in compliance with all safety requirements of the prevailing agencies. See Detail. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not to enter the trench. The owner shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out.
- C. The Contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth 6 inches below sewer line grade. Where materials are removed from below pipe grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.

- D. Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without approval of the City, and shall be in conformance with Washington Industrial Safety and Health Administration (WISHA) and Office of Safety and Health Administration (OSHA) Safety Standard.
- E. The bedding course shall be constructed to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to make up the joint.

6.09 Bedding

Gravel backfill for pipe bedding shall be installed in conformance with Section 2-09 of the WSDOT Standard Specifications. See Detail.

Bedding for Rigid Pipe (Ductile Iron Pipe):

Gravel backfill for rigid pipe bedding shall consist of crushed, processed, or naturally occurring granular material. It shall be essentially free from various types of wood waste or other extraneous or objectionable materials. It shall have such characteristics of size and shape that it will compact readily and shall meet the following specifications for grading and quality:

<u>Sieve Size</u>	<u>Percent Passing*</u>
3/4" Square	100
3/8" Square	95-100
U.S. No. 8	0-10
U.S. No. 200	0-3
Sand Equivalent	35 MIN.

*All percentages are by weight.

Bedding for Flexible Pipe (PVC pipe):

Gravel backfill for flexible pipe (PVC pipe) bedding shall consist of crushed, processed, or naturally occurring granular material. It shall be essentially free from various types of wood waste or other extraneous or objectionable materials. It shall have such characteristics of size and shape that it will compact readily and shall meet the following specifications for grading and quality:

<u>Sieve Size</u>	<u>Percent Passing*</u>
3/4" Square	100
3/8" Square	95-100
U.S. No. 8	0-10
U.S. No. 200	0-3
Sand Equivalent	35 MIN.

*All percentages are by weight.

Native Material shall not be used for bedding, unless approved by the City Engineer.

6.10 Backfilling

Backfilling and surface restoration shall closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Selected backfill material shall be placed and compacted around and under the sewer pipe by hand tools. Special precautions shall be provided to protect the pipe to a point 12 inches above the crown of the pipe. The remaining backfill shall be compacted to 95 percent of the maximum density in traveled areas and road "prisms", 90 percent outside driveway, roadways, road prism, shoulders, parking or other traveled areas. Where governmental agencies other than the City have jurisdiction over roadways, the backfill and compaction shall be done to the satisfaction of the agency having jurisdiction. If suitable backfill material, as determined by the City, is not available from trenching operations, the City may order the placing of gravel base conforming with Section 9-03.10 of the WSDOT Standard Specifications for backfilling the trench.

6.11 Street Patching and Restoration

See Chapter 4 for requirements regarding street patching and trench restoration.

6.12 Erosion Control

The detrimental effects of erosion and sedimentation shall be minimized by conforming with BMC 14.30 and the following general principles:

1. Soil shall be exposed for the shortest possible time.
2. Reducing the velocity and controlling the flow of runoff.
3. Detaining runoff on the site to trap sediment.
4. Releasing runoff safely to downstream areas.

In applying these principles, the Developer and/or Contractor shall provide for erosion control by conducting work in workable units; minimizing the disturbance to cover crop materials; providing mulch and/or temporary cover crops, sedimentation basins, and/or diversions in critical areas during construction; controlling and conveying runoff; and establishing permanent vegetation and installing erosion control structures as soon as possible.

1. Trench Mulching

Where there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, backfill material shall be compacted and held in place by covering the disturbed area with straw and held with a covering of jute matting or wire mesh anchored in place.

2. Cover-Crop Seeding

A cover crop shall be sown in all areas excavated or disturbed during construction that were not paved, landscaped and/or seeded prior to construction. Areas landscaped and/or seeded prior to construction shall be restored to their original or superior condition.

Cover-crop seeding shall follow backfilling operations.

The Developer and/or Contractor shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be re-seeded, if required, and additional measures taken to provide protection from erosion until the cover crop is capable of providing protection.

During winter months, the Contractor may postpone seeding, if conditions are such that the seed will not germinate and grow. The Developer and/or Contractor will not, however, be relieved of the responsibility of protecting all areas until the cover crop has been sown and affords protection from erosion.

The cover crop shall be sown at a rate of 10 to 15 pounds of seed per acre using a hand or power operated mechanical seeder capable of providing a uniform distribution of seed.

6.13 Adjustment of New and Existing Utility Structures to Grade

This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

1. Asphalt Concrete Paving Projects

On asphalt concrete paving projects, the manholes shall not be adjusted until the pavement is completed, at which time the center of each manhole lid shall be relocated from references previously established by the Developer and/or Contractor. The pavement shall be cut as further described and base material removed to permit removal of the cover. The manhole shall then be brought to proper grade.

Prior to commencing adjustment, a plywood and visqueen cover as approved by the City Public Works Department shall be placed over the manhole base and channel to protect them from debris.

The asphalt concrete pavement shall be cut and removed to a neat circle, the diameter of which shall not exceed 48" or 14" from the outside diameter of the ductile iron frame, whichever is smaller. The ductile iron frame shall be brought up to desired grade, which shall conform to surrounding road surface.

Adjustment to desired grade shall be made with the use of concrete or bricks. No cast or ductile iron adjustment rings will be allowed. An approved class or mortar (one part cement to two parts of plaster sand) shall be placed between manhole sections; adjustment rings or bricks and ductile iron frame to completely fill all voids and to provide a watertight seal. No rough or uneven surfaces will be permitted inside or out. Adjustment rings or brick shall be placed and aligned so as to provide vertical sides and vertical alignment of manhole steps and ladder.

Check manhole specifications for minimum and maximum manhole adjustment and step requirements. Special care shall be exercised in all operations in order not to damage the manhole, frames and lids or other existing facilities.

As soon as the street is paved past each manhole, the asphalt concrete mat shall be scored around the location of the manhole, catch basin, meter boxes or valve box. After rolling has been completed and the mat has cooled, it shall be cut along the scored lines. The manholes, catch basins, meter boxes and valve boxes shall then be raised to finished pavement grade and the annular spaces filled with cement concrete to within 1-1/2 inches of the finished grade. The remaining 1-1/2 inches shall be filled with asphalt concrete Class B to give a smooth finished appearance. See detail in Project Plans.

After pavement is in place, all joints shall be sealed with hot asphalt cement (AR 4000W). A sand blanket shall be applied to the surface of the AR 4000W hot asphalt cement binder to help alleviate "tracking".

Asphalt concrete patching shall not be carried out during wet ground conditions or when the ambient air temperature is below 50°F. Asphalt concrete mix shall be at required temperature when placed. Before making the asphalt concrete repair, the edges of the existing asphalt concrete pavement and the outer edge of the casting shall be tack coated with hot asphalt cement. The remaining 2" shall then be filled with Class B asphalt concrete and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density and uniformity of grade. The joint between the patch and the existing pavement shall then be carefully painted with hot asphalt cement or asphalt emulsion and shall be immediately covered with dry paving sand before asphalt cement solidifies. All debris such as asphalt pavement, cement bags, etc., shall be removed and disposed of by Developer and/or Contractor.

Prior to acceptance of a project, manholes shall be cleaned of all debris and foreign material. All manhole steps and ladders shall be cleaned free of grout. Any damage occurring to the existing facilities due to the Developer's and/or Contractor's operations shall be repaired at his/her own expense.

2. Adjustment of Manholes in Easements

Manholes in easement areas shall be adjusted to insure drainage away from the manhole frame and cover. The manhole frame and cover shall be set approximately 0.1 foot above finished grade. Concrete collars shall be set about the structure, as shown herein, in all non-paved areas.

3. Adjustment of Valve Box Castings

Adjustment of valve box castings (force main valving) shall be made in the same manner as for manholes.

6.14 Finishing And Cleanup

Before acceptance of sewer system construction, all pipes, manholes, catch basins, and other appurtenances shall be cleaned of all debris and foreign material. After all other work on this project is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction

areas shall be neatly finished to the lines, grades and cross sections of a new roadway consistent with the original section, and as hereinafter specified.

On sewer construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction shall be shaped so that upon completion the area will present a uniform appearance, blending into the contour of the adjacent properties. All other requirements outlined previously shall be met.

Slopes, sidewalk areas, planting areas and roadway shall be smoothed and finished to the required cross section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements, trees and shrubs. Machine dressing shall be supplemented by hand work to meet requirements outlined herein, to the satisfaction of the City and/or the Engineer.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade. Where the existing surface is below sidewalk and curb, the area shall be filled and dressed out to the walk. Wherever fill material is required in the planting area, the finished grade shall be elevated to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

All rocks in excess of 1 inch diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes dressed neatly so as to present a uniform, natural, well-sloped surface.

All excavated material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from clearing and grubbing or grading operations shall be removed and not placed in areas adjacent to the project. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer and/or Contractor shall remove and dispose of same and restore said disturbed areas at his own expense.

Drainage facilities such as inlets, catch basins, culverts, and open ditches shall be cleaned of all debris which is the result of the Developer and/or Contractor's operations.

All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of the City Utilities Superintendent and/or City Engineer.

Castings for manholes, valves, lamp holes, vaults and other similar installations which have been covered with the asphalt material shall be cleaned to the satisfaction of the City.

6.15 Final Acceptance

Prior to final inspection, all pipelines shall be flushed and cleaned and all debris removed. A pipeline "cleaning ball" of the proper diameter for each size of pipe shall be flushed through all pipelines prior to final inspection.

Before sewer lines are accepted, all lines shall be inspected for line and grade by checking each section between manholes for alignment. A full circle of light shall be seen by looking through the pipe at a light held in the manhole at the opposite end of the section of sewer line being inspected. Any corrections required in line and grade shall be made at the expense of the Developer and/or Contractor.

6.16 General Guarantee and Warranty

The Developer shall be required, upon completion of the work, and acceptance by the City, to furnish the City a written guarantee covering all material and workmanship for a period of two years after the date of final acceptance and he shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as the result of furnishing, poor materials and/or workmanship. The Developer shall obtain warranties from the Contractors, subcontractors and suppliers of material or equipment where such warranties are required, and shall deliver copies to the City upon completion of the work.

Easement documents, if applicable, shall be filed and recorded with the Pierce County Auditor's office and the documents reviewed by the City's Engineer and/or Attorney prior to project acceptance.

6.17 Sanitary Sewer Lift Stations

A. Objective

Section 6.17 is intended to present information and provide an outline of the minimum general standards to be accomplished in planning a sewage lift station installation within the City's service area.

The Developer shall submit to the City for review and approval, complete sewage lift station plans and design which provide for the lift station, electrical service/controls and telemetry system, auxiliary generator, and transfer switch together with all accessories for a complete, automatically operating installation.

Design material and drawings shall provide all civil, mechanical and electrical details and align with all applicable codes and regulations, and good engineering practice.

The principle components of a sewage lift station installation will be addressed in the remainder of this section.

B. Lift Station

1. Type

The sewage lift station shall be a submersible station of a type approved by the City or a Smith Loveless (or owner approved equal) buried, dry-pit-type, with an above-ground entrance hatch having a steel cover, lockable to City Standards, with anode protection. Construction shall be in compliance with O.S.H.A., U.L., A.S.T.M., N.E.C. and other applicable codes and regulations.

All sewage lift stations shall have, as a minimum, two sewage pumps. The pumps shall have sufficient capacity and capability to efficiently handle the peak design flow with one pump and to insure a minimum velocity of 3 feet per second in the force main. Design calculations and pump curves shall be provided with the submittal information, and stamped and signed by a currently licensed engineer in the State of Washington.

Each sewage pump shall be drilled, tapped and valved with 2-inch drainage fittings on the pump suction between the shut-off valve and the pump, and then piped to the sump.

The pump and motor shafts shall be the maximum diameter available for these units.

Pump motors shall be 3-phase, 60-cycle, and operate at the voltage as supplied by the utility company.

Three phase pump motors shall be N.E.M.A. standard starting or better as noted:

<u>Code</u>	<u>Starting KVA/HP</u>	<u>Typical Size Range</u>
A	0-3.15	---
A	3.15-3.55	---
A	3.55-4.0	---
A	4.0-4.5	---

<u>Code</u>	<u>Starting KVA/HP</u>	<u>Typical Size Range</u>
A	4.5-5.0	---
A	5.0-5.6	15 HP and Up
A	5.6-6.3	10 HP
A	6.3-7.1	7.5 and 5 HP
A	7.1-8.0	3 HP
A	8.0-9.0	2 and 1-1/2 HP
A	9.0-10.0	1 HP
A	10.0-11.2	Less Than 1 HP

The sewage lift station supplier shall check the station during installation to determine if the installation is correct. Written confirmation of each visit and recommendations shall be provided to the City Public Works Department.

The sewage lift station supplier shall provide four hours of check-out training for City personnel at the station site during start-up.

The sewage lift station supplier shall provide four complete copies of maintenance and operation material to the City Public Works Department.

The Developer shall demonstrate that no surge problems exist with the station, and if found to exist, that they shall be corrected at no expense to the City.

Provide mouse proofing where applicable to ground-mounted structures.

All keys, miscellaneous items, and spare parts shall be given to the City prior to approval.

The Developer shall provide an area yard light for the lift station site.

2. Capacity

The Developer shall perform a study and make the determination to assure that the lift station installation is sized to serve the overall sewage flows generated within the potential service area. The flow study shall include the Developer's plat boundary area as well as adjacent and future service areas. The service areas shall be the areas within that which could be served by the installation of the lift station(s).

The station's design flow capacity shall be based on an average daily per capita flow with related peaking factors and inflow/infiltration allowances.

Documentation of present and future service area flow rates for lift station size and capacity determination shall be provided to the City.

The effects of the minimum flow conditions shall be estimated to be sure that retention of the sewage in the wet well will not create a nuisance and that pumping equipment will not operate too infrequently.

Lift station capacity shall meet the maximum rate of flow expected. The capacity of the receiving sewer shall also match the flow expected. At least two pump units shall be provided at each lift station installation, each capable of handling the expected maximum flow.

3. Location

The Developer shall furnish a site layout for the lift station installation.

The sewage lift station shall be located as far as practicable from present or proposed built-up residential areas, and an asphalt concrete access road shall be provided. Noise control, odor control, and station architectural design shall be taken into consideration. Sites for sewage lift stations shall be of sufficient size for future expansion or addition, if applicable.

The limits of the cut and fill areas for the lift station site and access shall be within the easement area and the slope of all embankments shall not exceed 2:1. The method of fill construction, i.e., compaction, etc., shall be noted on the plans. The easement shall be submitted to the City for review prior to construction of the lift station. Lift station sites not located within the plat boundary shall be deeded to the City of Buckley.

The water service to the lift station site shall be 1-inch with a 1-inch buried washdown hydrant, together with backflow preventer of the reduced pressure type, both installed near the wet well, including meter box, meter and hose bib and 1-inch heavy-duty rubber hose, 50-foot long with a spray nozzle.

A 7'-0" high galvanized chain link fence with vertical wooden redwood or plastic slats in-laid for screening, and a combination 12-foot wide gate all with 3 rows of barbed wire enclosing the lift station and generator site shall be provided.

4. Wet Well

The wet well shall be of pre-cast concrete construction with flat slab cover and 30-inch hatch or manhole cover for access. The flat slab concrete cover shall be provided with a 4-inch vent which is "hooked and screened."

The wet well shall provide for the volute of the pumps to be fully submerged and a minimum of 3 minutes between pump cycles at pump capacity. The high water alarm shall be set a minimum of 7 inches below the invert of the lowest gravity sewer inlet pipe, or at an elevation as may be set by the City.

The wet well and the steel lift station shall be located on a common reinforced concrete slab. Protection against buoyancy shall be provided, together with the calculations to verify the same. The wet well chamber shall be provided with polypropylene safety steps as specified for typical precast manhole in accordance with the City's Standard Details.

The suction lines from the wet well to the pumps shall be a minimum of 6-inch inside diameter ductile iron, Class 53.

The force main shall be a minimum 6-inch diameter ductile iron Class 53, and provided with a continual positive slope. There shall be no intermediate high point between the pump station and the force main discharge point (depth shall be a minimum of 4'-0"). All pipes (gravity and pressure) entering and leaving the wet pit or dry pit shall have flexible couplings within 18-inches of the structure.

An outside drop manhole connection for the force main discharge into existing manholes shall be utilized with ductile iron fittings and the existing manhole re-channeled accordingly.

An emergency pump connection shall be located near the wet well.

C. Electrical Service/controls and Telemetry System

1. General

Codes and regulations exist at the federal, state, and local level dictating minimum acceptable requirements for electrical systems. The following partial list of codes and regulations shall be used as a basis for design and review.

- National Electric Code (NEC)
- Occupational Safety & Health Act (OSHA)
- State and Local Building Codes
- National Electrical Safety Code (NESC)

Various manufacturers and technical societies publish standards and recommendations. The following partial list of standards and recommendations shall be used as a basis for design and review whenever the project specifications have not made them mandatory.

- National Electrical Manufacturers Association (NEMA)
- Underwriters' Laboratory (UL)
- Insulated Power Conductor Engineering Association (IPCEA)
- American National Standards Institute (ANSI)
- Institute of Electrical & Electronic Engineers (IEEE)

2. Electrical Service

The local electric utility will be the primary source of electrical power. The Developer shall ascertain proper coordination between the nominal secondary delivery voltage supplied by the local power company and the connection to the lift station equipment. The electrical service shall be 4-wire, 3-phase, 60 hertz, with a solid neutral terminal at the disconnect, or as may otherwise be required by the local P.U.D.; this shall be confirmed with the local power company and confirmed by the suppliers.

The pump motors, generator and transfer switch shall match the utility supplied voltage.

All wire shall be copper.

All conduit shall be galvanized, rigid.

All installation shall be approved by the local P.U.D. and shall be in conformance with the N.E.C. (current issue) U.L. 98, O.S.H.A. and County and State electrical codes. The City shall be furnished with a certificate of final inspection by the inspecting agency.

All underground conduits shall be marked with polyethylene tape placed 6-inches below finished grade and directly above the conduit.

All conduit shall have a minimum of 24 inches of cover.

Heating strips shall be provided for outside electrical enclosures.

A service entrance shall be provided with a pedestal on which shall be mounted, as a minimum, the following equipment:

- a) Meter and meter can (as required by the local utilities).
- b) Meter C.T. (as required by the local utilities).
- c) Main disconnect circuit breaker in a N.E.M.A., 3-R, enclosure, with padlock to City Standards.
- d) A generator transfer switch, sized for the full connected load, in a N.E.M.A. 3-R enclosure, with padlock to City Standards.
- e) 277/480 Volt circuit, a 5 KVA minimum, 480 to 240/120-volt, single-phase transformer for outside installation with padlock to City Standards.
- f) A 240/120-volt panel (12-circuit) in a N.E.M.A. 3-R enclosure with padlock to City Standards.
- g) A 120-volt duplex in N.E.M.A. 3-R enclosure with padlock to City Standards.

- h) Ground rod and connector wire in conduit to N.E.C. Standards.
- i) For mounting electrical equipment, provide two, 6'-0" high (above ground) 4" H.W. steel galvanized pipe support posts with H.W. galvanized "*super strut*" for supporting equipment; for minimum required the length of the pedestal secure to the posts. Post shall be encased in ground 3'-0" with 12-inch diameter concrete encasement. Enclose assembly in 8-inch thick poured-in-place concrete pad (finished surface 3 inches above ground), reinforced with #5 bars at 8 inches wide. Chamfer all concrete edges 3/4-inch.
- j) When applicable, as determined by the City, include a galvanized roof structure over electrical enclosures.
- k) Provide a 2-inch future conduit from a point 6 inches above the concrete slab as noted above, thence, underground to a point 24 inches from slab. Cap both ends.

Provide electrical single-line diagram showing all components and control between pedestal, lift station and generator with wire and conduit sizes.

The City shall be provided with a complete reproducible set of as-constructed Plans and Details showing final location of all equipment, conduit and wire.

3. Controls

Control and instrument system plans shall thoroughly and completely depict system design. The plans, in conjunction with the specifications, shall define the type of control system, the type of components in the system, set points and the interface between the instrumentation and control system and the lift station system. To accomplish this, the control and instrument plan(s) shall include, as a minimum, the following

- a) Control and instrumentation system legend and general notes
- b) Control, instrumentation and distribution diagram

- c) Plans showing location of all control, instrument, and distribution system equipment and components, both electrical and pneumatic
- d) All equipment and installation details

The power, control and instrumentation systems shall be designed with both operational reliability and maintainability. Use standard products wherever possible.

All components within the lift station system, including both internally and face-mounted instruments and devices shall be clearly identified with phenolic nameplates of black background with white letters.

All wiring between cabinet, equipment and components shall be marked and multiple color coded where applicable.

All wiring shall be copper.

All pump motors shall have an independent circuit breaker located within the lift station and the lift station shall have a main circuit breaker located outside the lift station.

The lift station shall be furnished with a wet well gauge in the control panel. The control panel shall be furnished with an A-O-H switch for each pump motor and voltage monitor relays to protect the pump motors from single-phasing, phase reversal and low voltage.

The pump controls shall be air bubbler type with two compressors alternating on timer control, and shall provide for both pumps to operate at high water conditions. The control elevations shall be indicated on the plans, i.e., on-off, first pump on, second pump on, and high water alarm.

The single-phase transformer for the lift station shall be 5 KVA, or as required for proper operation of the single phase side system.

The lift station electrical circuit shall be modified for generator starting and telemetry as required.

Provide check valve limit switches and relays to confirm pump run to telemetry on each pump.

A complete set of spare fuses shall be provided for all fused equipment.

4. Telemetry

The lift station installation shall be installed with a complete telemetry system. This shall include all remote equipment, at the lift station, and all central based equipment, at the office of the City of Buckley.

Telemetry shall be furnished and installed by S&B, Inc., and shall be compatible with any current system and shall send all signals to the City office. The alarm priority shall be: 1) telemetry line failure; 2) normal power failure; 3) water in dry pit; 4) high/low water wet well; and 5) pump failure; 6) generator run. All contacts shall close on alarm. The panel shall be installed within the lift station. A water level sensor shall be provided in the dry pit.

The City will coordinate with the telemetry supplier and further mandate those alarms which the City desires to transmit.

All telemetry equipment shall be installed in a single NEMA 3R metal enclosure with an inner and outer door and shall be padlocked to City Standards. This equipment shall be installed on the electrical service mounting rack.

For ease of serving and maintaining the equipment, all wiring shall be multi-colored and numbered, using solderless pressure connectors.

All major components, including relays, timers, tone transmitters, and receivers, and power supplies shall be identified using phenolic or vilam engraved labels.

A line (surge) protector unit shall be provided for the telemetry equipment. The unit shall protect the equipment from transient and electrical surges on the telephone line. Protection shall include line fuses and clamps for voltages over 25 volts, gas tubes shall be provided as an integral part of the lightning protection unit.

The telemetering between the central based system and the lift station site shall be performed over a voice grade circuit leased to the City from the local telephone company. The telemetry supplier shall coordinate with the City to ensure proper circuits are furnished.

D. Auxiliary Power System

1. General

Emergency power generation equipment shall be provided at the lift station site which will operate the lift station in the event of a commercial power outage.

It is essential that the emergency system be designed with capacity and rating to carry safely the entire connected lift station load.

The auxiliary power unit shall be complete in every respect and shall include, but not be limited to, the following:

- a) Generator, control panel and circuit breaker.
- b) Engine, radiator and exhaust system.
- c) Fuel tank.
- d) Generator set enclosure.
- e) Automatic transfer switch.
- f) Battery and rack.
- g) Battery charger.
- h) Conduit, wire and piping.

The auxiliary power unit shall be new, factory assembled, tested and as manufactured by Cummins/Onan, or owner approved equal. The generator set shall be manufactured and installed to all current electrical and other codes and regulations, as required by national, state, county and local agencies having jurisdiction.

Generator shall be capable of automatic starting and maintaining a full load from a cold start.

Generator shall have locking panels to engine and butterfly compartment. Fuel tank and radiator cap shall be lockable with common key.

Provide mouse proofing where applicable to ground-mounted structures.

2. Power System

Generator, engine and accessories enclosed in metal enclosure with removable panels and sides. Enclosures shall be lockable to City Standards.

Generator shall be designed so that the danger of accidents to the operator will be minimized.

Suitable guards shall be provided on all electrical parts to minimize the personal shock hazard.

Generator shall be broken-in sufficiently to permit application of full load immediately upon installation.

Generator supplier shall provide all tools for the generator set as recommended and required by the manufacturer.

Generator installation shall be checked three (3) times by the supplier during construction to determine that the installation is correct. Written confirmation of each visit and recommendations shall be provided to the City.

Generator supplier shall provide two (2) eight (8) hour days of supervision during start-up.

Generator supplier shall provide training for City personnel. This training shall be four (4) hours in length, and shall be conducted at the lift station site.

Generator manufacturer shall provide four (4) copies of maintenance and operations manual. These manuals shall be complete and shall include all information necessary to allow City personnel to maintain the generator.

Generator mounting pad shall be reinforced concrete to carry the weight of the unit and shall extend a minimum of 3 inches beyond generator housing. Chamfer all edges 3/4-inch.

Propane tank support pad shall be as above.

Provide a roof structure and/or fiberglass enclosure over generator per City direction. If the City desires a roof structure, the structure shall be designed by the Developer's engineer and subject to the City's approval. It shall be designed to protect the generator and City personnel from inclement weather, to be utilized as a noise barrier, and be aesthetically pleasing to the surrounding area.

a) Engine

(Shall be provided with/have):

Engine shall be propane fueled. No gasoline or diesel engines are permitted. Fuel tank shall be above-ground, separate from unit for propane. Capacity shall be 24 hours when full + 25 percent reserve.

Fuel system shall be provided with an electrical shut-off valve with flexible connection to the generator. The generator set shall be manufacturer in compliance with the following codes, regulations and standards; N.E.M.A., I.E.E., A.N.S.I., N.E.C. and O.S.H.A.

Generator recovery after acceptance of 100% rated load in one step shall be 1 second.

Cooling shall be by radiator, provided with anti-freeze protected to -45°F and with corrosion protection. Provide block heater. Radiator cover shall have padlock hasp and padlock to City Standards.

Lubrication shall be full circulation pressure type, with replaceable filter with bypass.

Engine governor shall be gear-type mechanical.

Engine air filter shall be replaceable type.

Generator unit shall be furnished with vibration mounts.

Electrical fuel shut-off and flex-connections to engine.

Engine oil drain extension.

Stainless steel flexible exhaust connector and hospital (critical) rated muffler with condensation and rain collector including insulation.

Skid base with vibration isolators between base and concrete pad; secure to concrete per manufacturer's specifications.

High amperage industrial rated batteries and cables.

Battery charger capable of recharging battery in 4 hours from complete discharge.

Engine shall be 1,800 rpm, 4-cycle.

b) Generator

(Shall be provided with/have):

Designed and manufactured in accordance with N.E.M.A., I.E.E., and A.N.S.I. standards for temperature rise and all applicable electrical codes.

Revolving field, dynamically balanced, static excited, static regulated, 12-lead.

Upon application of rated continuous load, in one step, voltage dip shall be less than 25 percent or less with recovery to normal voltage in less than one second, measured with a light beam oscillograph.

Voltage regulation, solid state, within + 1 percent.

40°C temperature rise above 90°C ambient operation.

Frequency regulation within 3-hertz.

Radio suppression.

Self-ventilated, drip-proof construction.

Brushless, fast response, amortized winding, Class "B" and "F" fungus resistant. Coils and stator mechanically and epoxy braided.

Winding heaters shall be provided (120-volt).

Shock mounted.

Pump lockout circuit when generator is running (locked-out pump to be second call pump).

Low coolant level alarm shall shut down unit if coolant level is low.

Generator shall be 3-phase, 60-cycle and shall match the supply voltage of the utility distribution system.

c) Control Panel

(Shall be provided with/have):

Three position selector switch (off, test, automatic), which shall include a red flashing indicator light which lights in the off position.

Manual start-stop switch for testing without interrupting normal source.

Contact for an alarm and report system (6 contacts)
N.O./N.C.

Cranking reset button.

Over-cranking protection shall open cranking circuit after 30-90 seconds of cranking (adjustable).

Cranking cyler with four attempts of 15 seconds each and 10 second rest periods between attempts.

Line circuit breaker rated at full generator capacity.

AC volt meter with switch for each phase.

AC ammeter with switch for each phase.

Current transformers.

Frequency meter.

Running time meter (99,999.9 hours capacity)

Panel light.

Oil pressure gauge.

Water temperature gauge.

Voltage adjusting reostat.

Alarm indication panel with shut-off control; 1) over-speed; 2) over-crank; 3) high temperature; 4) low oil pressure; 5) low coolant level.

All contacts shall close on alarm.

All alarm sensors and instruments shall be protected by individual push-type reset circuit breakers.

Generator load meter (to measure true load on generator) in kW.

Panel to be N.E.M.A. 12 construction.

3. Transfer Switch

The transfer switch shall be sized, in amps, to equal plus 25 percent, the full connected load of the lift station generator and auxiliary equipment. The transfer switch shall be enclosed in a N.E.M.A. 3-R cabinet with padlock to City Standards and mounted on the entrance pedestal.

Shall be U.L., 1008 and C.S.A. approved.

Shall protect all types of loads, inductive and resistive.

Shall be rated, 3-phase, 60-cycle, 3-pole, 4-wire with neutral lug and match the commercially supplied system voltage.

Shall be rated for all classes of loads without de-rating, either open or closed.

Shall automatically transfer load upon failure of normal power and return upon restoration of normal power.

Shall be electrically operated, mechanically-held using circuit breakers.

Shall be provided with time delay in the neutral position.

The automatic transfer panel shall have solid state, close-differential, field-adjustable, voltage-sensing relays, nominally set at 70 percent drop-out and 90 percent pick-up, both modes: emergency to normal and normal to emergency.

Interrupting and withstand capacity, measured symmetrical of breakers shall be as follows:

40, 70, 100 amp =	14,000
150, 260 amp =	30,000
400, 600 amp =	65,000
800, 1000 amp =	65,000

The automatic transfer switch shall obtain current from the source to which the load is being transferred.

Panel shall be front opening.

All equipment listed shall be mounted directly in the automatic transfer panel lockable cabinet.

All equipment shall be accessible from the front of the cabinet for ease of maintenance or removal.

All pilot devices and/or relays shall be industrial type rated 10-amperes with self-cleaning contacts.

Components of the operation mechanism shall be insulated or electrically dead.

The transfer mechanism shall be energized only momentarily during transfer.

Components of linkages and handles of operating mechanism shall be ruggedly constructed and not subject to deterioration.

Time Delay - transfer from normal power source to standby generator set, shall be delayed in order to override momentary power fluctuations or outages. Adjustable, 0 to 50 seconds.

Time Delay - emergency to normal transfer shall be delayed after normal power resumes to permit stabilization of the normal power source prior to transfer. Adjustable, 30 seconds to 30 minutes.

Time Delay for Engine Cool-Off - a time delay shall allow the engine to run, unloaded for a period of not less than two minutes after power has been transferred back to the normal source. The time delay shall be adjustable from a minimum period of 60 seconds to 15 minutes.

Protection for under-voltage, over-voltage, phase reversal, single-phasing, unbalanced operating voltage; both modes - emergency to normal and normal to emergency.

Auxiliary Contacts - a minimum of six (6) pairs of auxiliary contacts shall be provided in the transfer switch panel, complete with switches to prevent chosen circuits from operating during periods of normal power outage. The contacts shall be cartridge type convertible from normally closed to normally open.

Time delay at the neutral position - when transferring from normal power to generator power and from generator power to normal power. Time delay shall be adjustable from 0.2 to 50 seconds.

SECTION 8

LIST OF MISCELLANEOUS DETAILS

SECTION 8**8. LIST OF MISCELLANEOUS DETAILS**

8.01 TITLE OF DRAWING	DWG. NO.
<u>Roadway Details:</u>	
Major Arterial Street Section	ST-1
Minor Arterial Street Section	ST-2
Collector Street Section	ST-2A
Local Access Street Section	ST-2B
Private Access Street Section	ST-2C
Half Street Section	ST-2D
Alley Section	ST-4
Maintenance Overlay Detail	OVERLAY
Trench Pavement Restoration	ST-5
Poured Monument in Place Detail	MON-1
Sight Obstruction Detail	ST-6
Surface Monument Detail	ST-8
Sidewalk without Planting Strip Detail	SW-1
Sidewalk with Planting Strip Detail	SW-4
Meandering Sidewalk	SW-5
Cement Concrete Driveway With Planter Strip	4-10
Cement Concrete Driveway Without Planter Strip	4-11
Driveway Approach	4-12
Wheelchair Ramp Detail	WHCH RAMP
Concrete Curb and Gutter Detail	CG-1
Turn Arrow Details	CHAN-1
Pavement Marking Details	CHAN-2
Parking Space Marking Details	CHAN-3
Street Sign Detail	SIGN-1
Typical Street Name Sign	SIGN-2
Vehicular Control Signs	SIGN-3
Protected Wetland Sign Installation Detail	SIGN-4
Stormwater Pond Sign Detail	SIGN-5
Stormwater Pond Sign Post Detail	SIGN-6
Mailbox (Placement) Detail	ML-1
Trail Bollard Detail	TRLBLD
<u>Storm Drainage Details:</u>	
Manhole, Catch Basin (Type II), or Valve Box Grade Adjustment Detail	STOM-2
Storm Drain Pipe Trench Section Detail	STOM-6

LIST OF MISCELLANEOUS DETAILS

Catch Basin, Type I, Detail	CB-1
Flow Restrictor Catch Basin, Type II, Detail	CB-2
Stormwater Pond Sign Detail	SIGN-5
Stormwater Pond Sign Post Detail	SIGN-6

Sanitary Sewer Details:

Typical Precast Manhole Detail	TPMH
Typical Manhole Plan (View) Detail	TMHP
Typical Shallow Precast Manhole Detail	TSPMH
Typical Saddle Manhole Detail	TSMH
Outside Drop Manhole Detail	ODMH
Inside Drop Manhole Detail	IDMH
Manhole Frame and Cover Detail	MHFC
Polypropylene Ladder and Manhole Steps Detail	PLMHS
Force Main Discharge Manhole Detail	FMDMH
Sanitary Sewer Trench Section for PVC Pipe Detail	SSTSPVCP
Sanitary Sewer Trench Section for DI Pipe Detail	SSTSDIP
Pressure Line and Force Main Typical Trench Section Detail	PLFMTTS
Typical Side Sewer Detail within New Development Detail	TSSD
Side Sewer Detail (within Existing Street ROW) Detail	SSD
Standing Side Sewer Detail	SSS
Private Side Sewer Installation Detail	PSSI
Roof Structure for Electrical Enclosure Detail Lift Station	RSEE
Lift Station Electrical Schematic Detail	LSES
Air & Vacuum Release Assembly (Sanitary) Detail	AVRA
Manhole Frame Collar Detail	MHCLAR

Water Details:

Water Main Trench Section Detail	WMTS
1" and Smaller Water Service Detail (2 pages)	11
1-1/2" & 2" Water Service Detail	WS2
Wet Tap Connection Detail	WTC
Cut In Connection Detail	CIC
Water Valve Stem Extension Stem Detail	20
Typical Utility Crossing Detail	TUC
Water Main Depth Requirement Detail	1
Thrust Block Detail	TB
Anchor Block Detail	VAB
Fire Hydrant Relocation Detail	9
Fire Hydrant Installation Detail	8

LIST OF MISCELLANEOUS DETAILS

Fire Hydrant Location (in cut or fill section) Detail	FHLCF
2" Blow-Off Assembly Detail	BOA
Water Sampling Station Detail	16
Air & Vacuum Release Assembly (Water) Detail	15
Double Check Detector with Fire Connection Detail	18
Detector Double Check Valve Assembly (2 pages)	24
"Individual" Double Check Detector Assembly IDD	23
Pressure Reducing Station Detail (Two Pages)	19
Water and Meter Vault Assembly (3" thru 10") Detail (3 pages)	13
Reduced Pressure Back Flow Device (3/4" to 2")	25
Reduced Pressure Back Flow Device (3" and Larger)	26
Valve Box Adjustment Detail	17

General Details:

Straw Bale Dam Detail	EC-2
Silt Fence Detail	EC-1
Storm Drain Inlet Protection Detail	STOM-4
Swing Gate and Fence Detail	SGF-1
Asphalt Pavement Repair Detail	22
Asphalt Diamond Patch Detail	21
Rock Wall Detail	RKWL
Geosynthetic Retaining Wall	RW-1
Gabion Retaining Wall	RW-2
H-Pile Retaining Wall	RW-3
Rock Buttress Retaining Wall	RW-4
Street Tree Planting & Staking Detail	LSCP-1
Buckley Street Tree List (9 pages)	ST-1
Landscaping Items (4 pages)	TL-1
Fence Detail (2 pages)	FE-1
Protected Wetland Sign Detail	SIGN-4
Typical Utility Crossing Detail	TUC

SANITARY SEWER DETAILS

MANHOLE FRAME & COVER WITH "SEWERS"
CAST ON COVER WITH 3" HIGH RAISED
LETTERS (NON-SKID PATTERN) AS
MANUFACTURED BY "SATHER MANUFACTURING
CO., INC." NO. 6024-R. 3 HOLE LOCKING
FRAME AND COVER. ONE (1) BOLT HOLE
TO BE CENTERED OVER LADDER

FIRST STEP
14" MIN.
18" MAX.

GROUT BETWEEN RINGS

POLYPROPYLENE MANHOLE
STEPS NO. P-13938 LOCATED
AT 12" O.C.

GROUT LIFT HOLES
INSIDE AND OUTSIDE

POLYPROPYLENE LADDER
(3' MAXIMUM LENGTH)

SEE NOTE 1

CHANNEL
3/4 PIPE DIA

SEE NOTE 4

FINISHED GRADE

4" X 24" PRECAST CONC.
ADJUSTMENT RINGS
2 RINGS REQUIRED
4 RINGS MAXIMUM
PLASTER INSIDE AND
OUTSIDE FACE WITH 1/2"
THICK GROUT

48" TO 24" OFFSET CONE

48" OR 54" (INSIDE DIAMETER)
PRECAST MANHOLE

RUBBER GASKET SEALING
ELEMENT

SHORT PIPE SECTION AT
MANHOLE (D.I. PIPE ONLY)

SLOPE 3/8"/FT

FLOW

GROUT FILL

FOUNDATION GRAVEL
8-INCH MINIMUM

UNDISTURBED EARTH

NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A MANHOLE COUPLING INTO WALL.
D.I. PIPE: BELL AND SPIGOT JOINT OR FLEXIBLE COUPLING
EITHER SHALL BE 12" MAXIMUM DISTANCE FROM MANHOLE WALL.
PVC AND D.I. PIPE, OPTIONAL: CORE THE MANHOLE AND
CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER
BOOT IN MANHOLE WALL, KOR-N-SEAL BOOT
OR EQUAL.
2. DROP OF GRADE THRU MANHOLE SHALL
BE 0.10', UNLESS OTHERWISE REQUIRED/
APPROVED BY CITY ENGINEER.
3. LARGER MANHOLES WILL BE REQUIRED AT
THE DISCRETION OF THE CITY ENGINEER
BASED ON PIPE SIZE, NUMBER AND
ORIENTATION OF PIPE(S).
4. INSTALL CONCRETE COLLAR. SEE DETAIL.
5. PRE-CHANNELED MANHOLES ARE NOT
ACCEPTABLE.

CITY OF BUCKLEY

TYPICAL PRECAST MANHOLE

APPROVED:

CLB

1/25/17

DWG. NO.

TPMH

PUBLIC WORKS DEPT.

DATE

DATE:
8/96

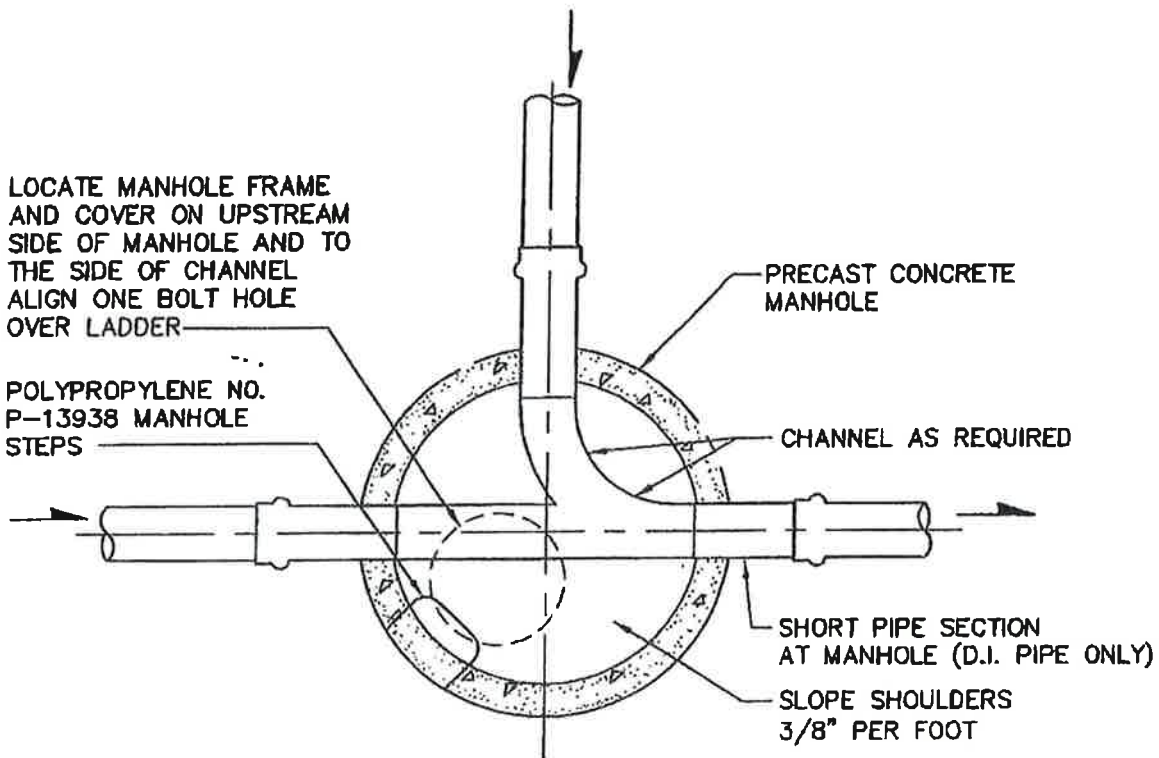
DRWN:
J.H.

CHKD:
T.J.O.

SCALE:
NONE

LOCATE MANHOLE FRAME
AND COVER ON UPSTREAM
SIDE OF MANHOLE AND TO
THE SIDE OF CHANNEL
ALIGN ONE BOLT HOLE
OVER LADDER

POLYPROPYLENE NO.
P-13938 MANHOLE
STEPS



NOTE:

PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A MANHOLE COUPLING INTO WALL.
D.I. PIPE: BELL AND SPIGOT JOINT OR FLEXIBLE COUPLING.
EITHER SHALL BE 12" MAXIMUM DISTANCE FROM MANHOLE WALL.
PVC AND D.I. PIPE, OPTIONAL: CORE THE MANHOLE AND
CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER
BOOT IN MANHOLE WALL, KOR-N- SEAL BOOT OR EQUAL.
ALL CONNECTIONS TO EXISTING MANHOLES SHALL BE MADE
WITH A CONCRETE CORING MACHINE UNLESS OTHERWISE
APPROVED BY THE CITY.

CITY OF BUCKLEY

TYPICAL MANHOLE PLAN

APPROVED:

Ch. B. L.

1/25/97

DWG. NO.

TMHP

PUBLIC WORKS DEPT.

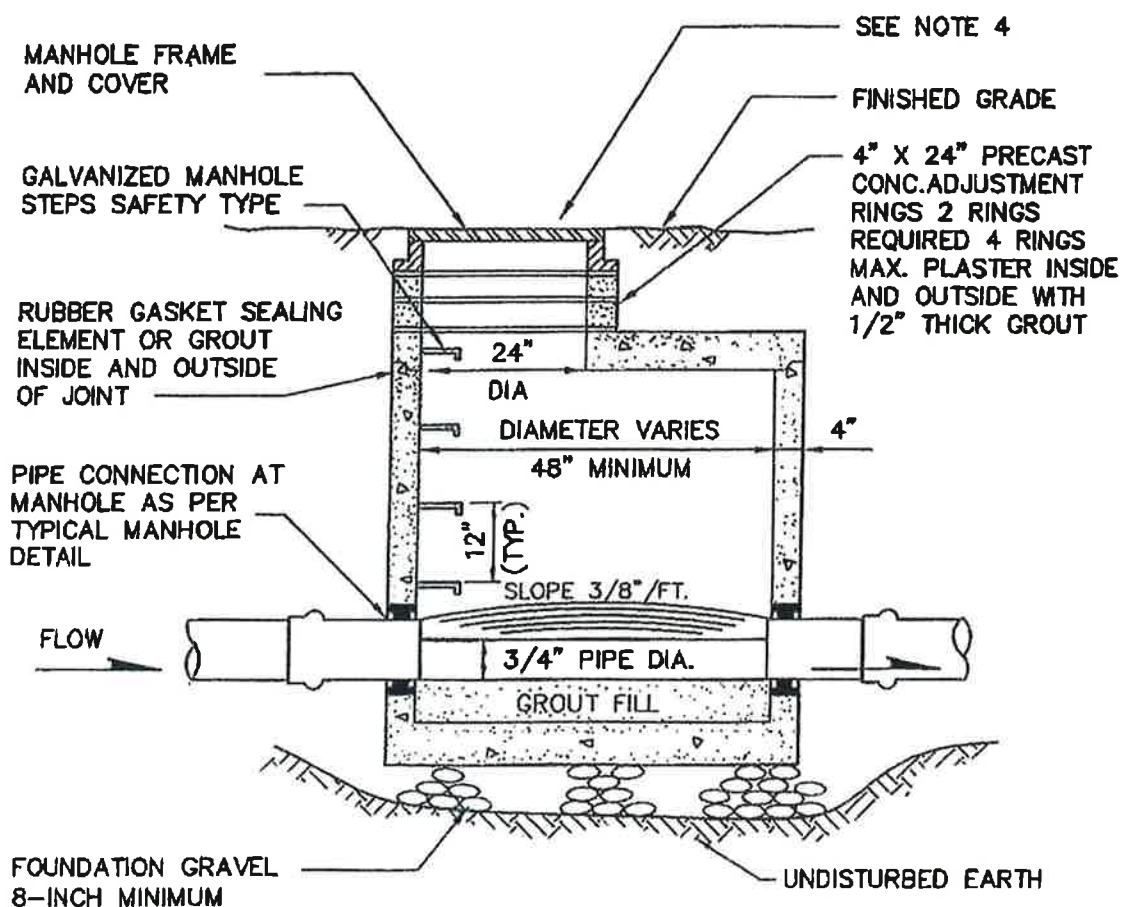
DATE

DATE:
8/93

DRWN:
E.S.T.

CHKD:
T.J.O.

SCALE:
NONE



NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A MANHOLE COUPLING INTO WALL.
D.I. PIPE: BELL AND SPIGOT JOINT OR FLEXIBLE COUPLING
EITHER SHALL BE 12" MAXIMUM DISTANCE FROM MANHOLE WALL.
PVC AND D.I. PIPE, OPTIONAL: CORE THE MANHOLE AND
CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER
BOOT IN MANHOLE WALL, KOR-N-SEAL BOOT
OR EQUAL.
2. DROP OF GRADE THRU MANHOLE SHALL
BE 0.10'.
3. PRE-CHANNELED MANHOLES ARE
NOT ACCEPTABLE.
4. CONSTRUCT CONCRETE COLLARS
PER DETAILS.

CITY OF BUCKLEY			
TYPICAL SHALLOW PRECAST MANHOLE			
APPROVED: <i>Ch. B...</i>		DWG. NO. TSPMH	
PUBLIC WORKS DEPT.		DATE 1/25/17	
DATE: 8/96	DRWN: J.H.	CHKD: T.J.O.	SCALE: NONE

MANHOLE FRAME & COVER WITH "SEWERS"
CAST ON COVER WITH 3" HIGH RAISED
LETTERS (NON-SKID PATTERN) AS
MANUFACTURED BY "SATHER MANUFACTURING
CO., INC." NO. 6024-R. 3 HOLE LOCKING
FRAME AND COVER. ONE (1) BOLT HOLE
TO BE CENTERED OVER LADDER

FIRST STEP
14" MIN.
18" MAX.

GROUT BETWEEN RINGS

POLYPROPYLENE MANHOLE
STEPS NO. P-13938 LOCATED
AT 12" O.C.

GROUT LIFT HOLES
INSIDE AND OUTSIDE

POLYPROPYLENE LADDER
(3' MAXIMUM LENGTH)

CUT OUT EXISTING PIPE,
MAKE SMOOTH INVERT &
CHANNEL AFTER NEW LINE
IS ACCEPTED.

CAST IN PLACE
CHANNEL & SHELF,
3000# PSI CONCRETE

8" MINIMUM

SEE NOTE 3

FINISHED GRADE

4" X 24" PRECAST CONC.
ADJUSTMENT RINGS
2 RINGS REQUIRED
4 RINGS MAXIMUM
PLASTER INSIDE AND
OUTSIDE FACE WITH 1/2"
THICK GROUT

48" TO 24" OFFSET CONE

PRECAST MANHOLE

RUBBER GASKET SEALING
ELEMENT

SHORT PIPE SECTION AT
MANHOLE (D.I. PIPE ONLY)

FLOW

FOUNDATION GRAVEL
8-IN MINIMUM

UNDISTURBED EARTH

NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A MANHOLE COUPLING INTO WALL.
D.I. PIPE: BELL AND SPIGOT JOINT OR FLEXIBLE COUPLING
EITHER SHALL BE 12" MAXIMUM DISTANCE FROM MANHOLE WALL.
PVC AND D.I. PIPE, OPTIONAL: CORE THE MANHOLE AND
CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER
BOOT IN MANHOLE WALL, KOR-N-SEAL BOOT
OR EQUAL.
2. DROP OF GRADE THRU MANHOLE SHALL
BE 0.10', UNLESS OTHERWISE APPROVED
BY CITY INSPECTOR.
3. INSTALL CONCRETE COLLAR.
SEE DETAIL

CITY OF BUCKLEY

TYPICAL SADDLE MANHOLE

APPROVED:

CLB

1/25/12

PUBLIC WORKS DEPT.

DATE

DWG. NO.

TSMH

DATE:

8/96

DRWN:

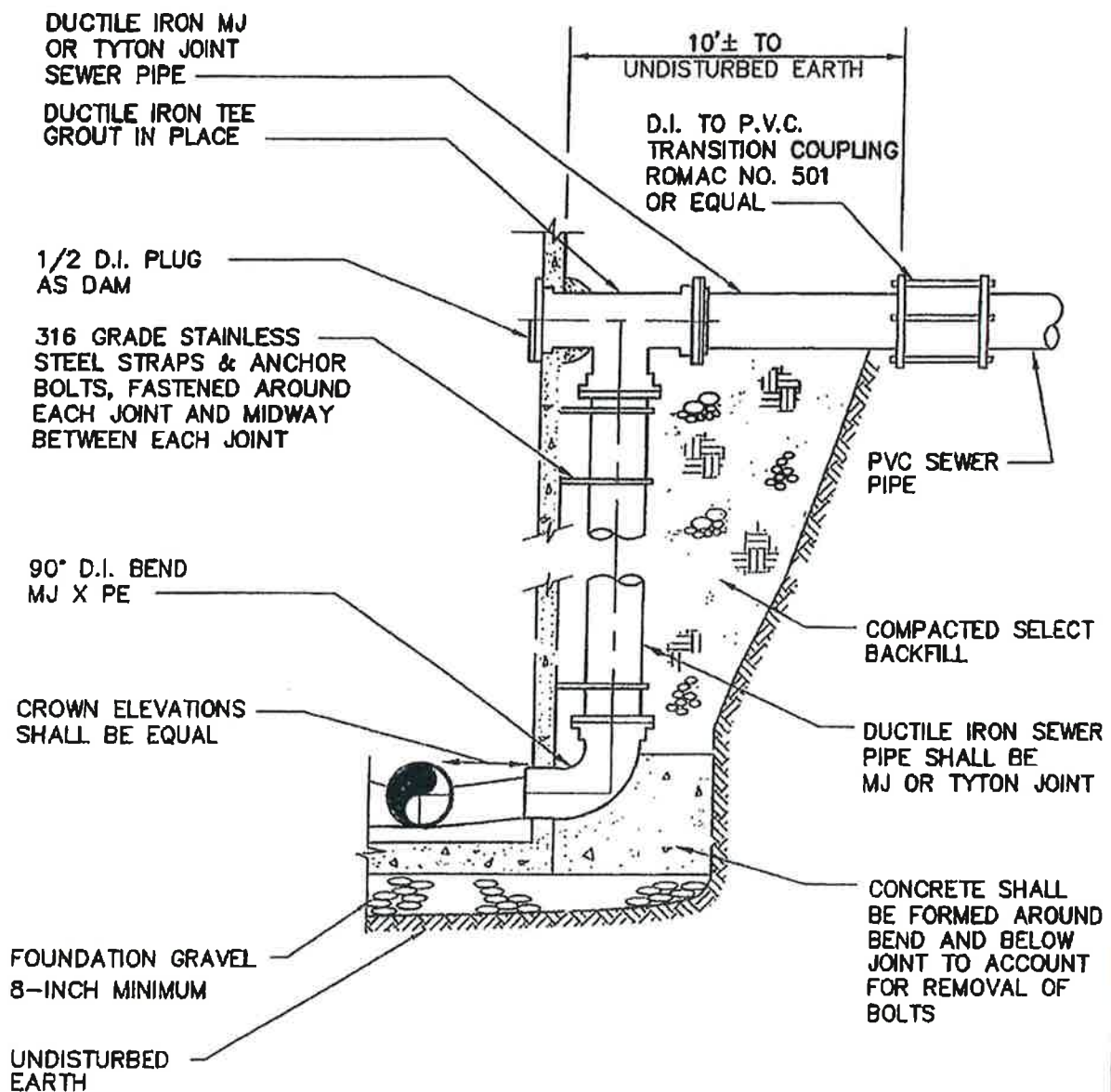
J.H.

CHKD:

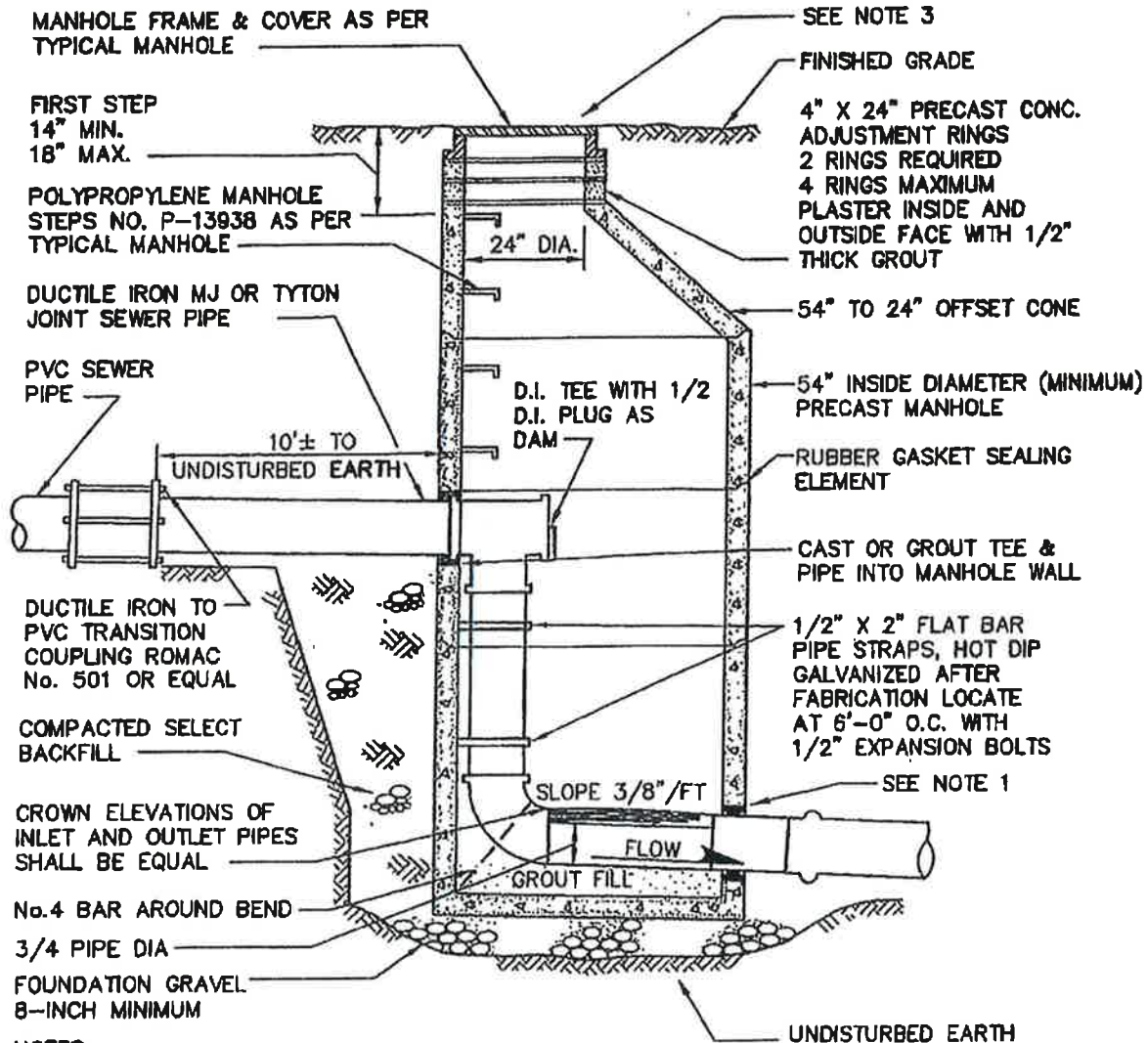
T.J.O.

SCALE:

NONE



CITY OF BUCKLEY			
OUTSIDE DROP MANHOLE			
APPROVED: <i>Ch. B...</i>		1/25/17	DWG. NO. ODMH
PUBLIC WORKS DEPT.		DATE	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE



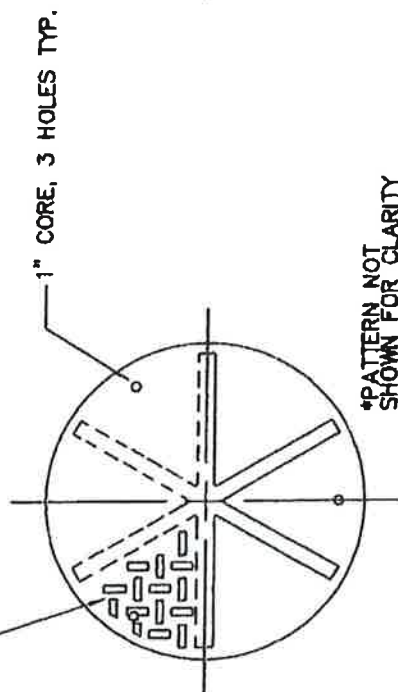
NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A MANHOLE COUPLING INTO WALL.
D.I. PIPE: BELL AND SPIGOT JOINT OR FLEXIBLE COUPLING
EITHER SHALL BE 12" MAXIMUM DISTANCE FROM MANHOLE WALL.
PVC AND D.I. PIPE, OPTIONAL: CORE THE MANHOLE AND
CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER
BOOT IN MANHOLE WALL, KOR-N-SEAL BOOT
OR EQUAL.
2. DROP OF GRADE THRU MANHOLE SHALL
BE 0.10', UNLESS OTHERWISE APPROVED
BY CITY INSPECTOR.
3. INSTALL CONCRETE COLLAR.
SEE DETAIL
4. PRE-CHANNELED MANHOLE ARE NOT
ACCEPTABLE

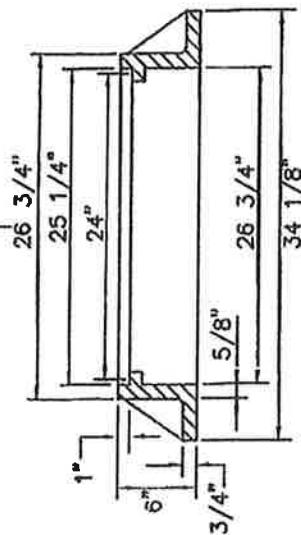
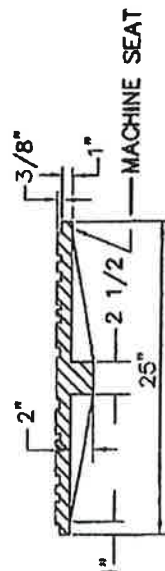
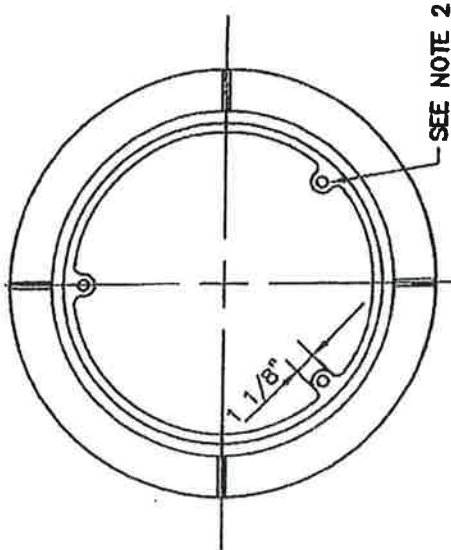
CITY OF BUCKLEY			
INSIDE DROP MANHOLE			
APPROVED:		DWG. NO.	
<i>Ch. B.</i>		1/25/17	
PUBLIC WORKS DEPT.		DATE	
DATE:	DRWN:	CHKD:	SCALE:
8/96	J.H.	T.J.O.	NONE

COVERS SHALL HAVE THE WORD "SEWER" IN RAISED LETTERS WHEN USED IN CONNECTION WITH SANITARY SEWER INSTALLATION, OR "WATER" WHEN IN CONNECTION WITH WATER DISTRIBUTION INSTALLATION.

NON-SKID PATTERN SHALL BE CAST INTEGRAL ON TOP OF COVER



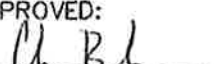
*PATTERN NOT SHOWN FOR CLARITY

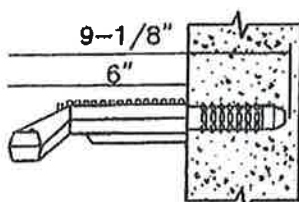
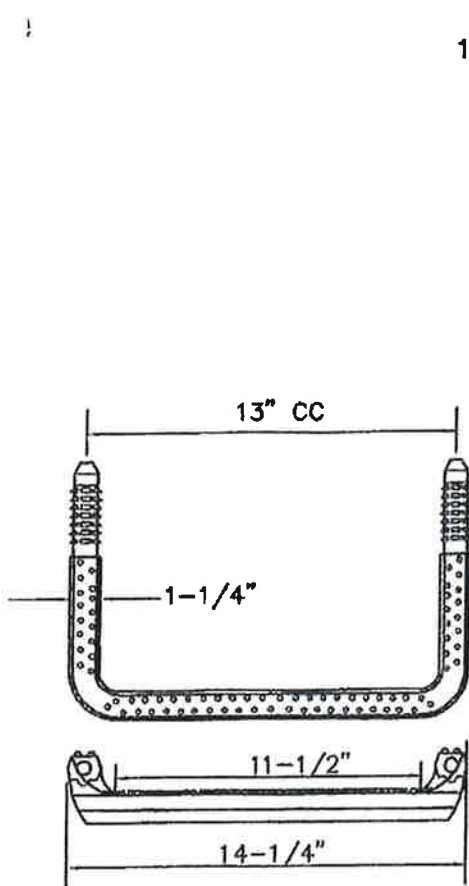


DUCTILE IRON LOCKING COVER
MINIMUM WEIGHT 180 LBS

NOTES:

1. MATERIALS ARE DUCTILE IRON ASTM A-40 CLASS 30
2. DRILL AND TAP THREE 5/8" HOLES THRU FRAME AT 120° AND 11 1/16" RADIUS
3. SATHER MANUFACTURING CO 6024-R OR OTHERWISE APPROVED R EQUAL
4. WATERTIGHT MANHOLE FRAME AND COVERS MAY BE REQUIRED BASED ON LOCAL CONDITIONS.
5. ALL MANHOLES LOCATED OUTSIDE PAVEMENT AREAS SHALL BE PROVIDED WITH LOCKING MANHOLE FRAME AND COVER.

CITY OF BUCKLEY			
MANHOLE FRAME AND COVER			
APPROVED:			DWG. NO.
 PUBLIC WORKS DEPT.			MHFC
DATE:	DRWN:	CHKD:	SCALE:
7/95	S.L.B.	T.J.O.	NONE

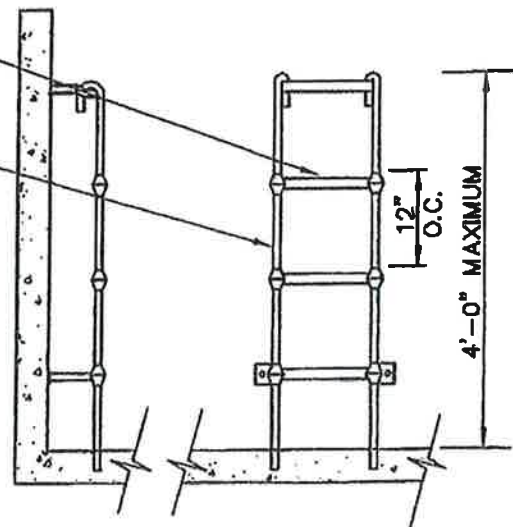


POLYPROPYLENE STEP, LANE
NO. P-13938 OR EQUAL

**POLYPROPYLENE
MANHOLE STEPS**

RUNG
1/2" GRADE 60

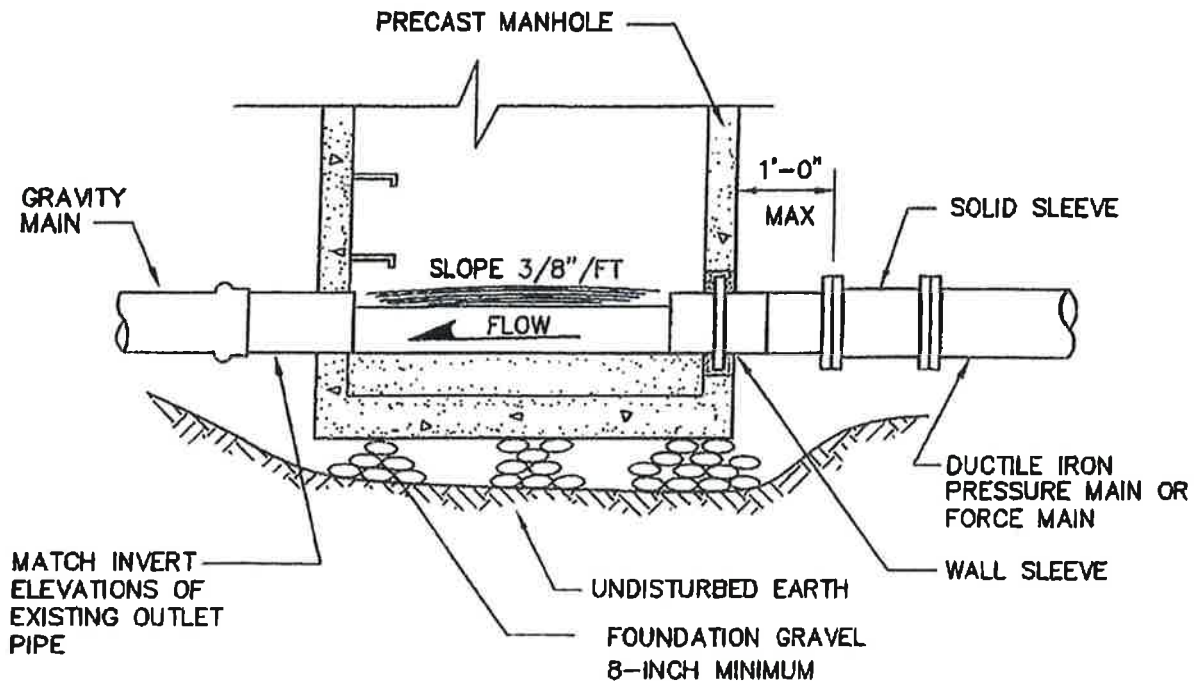
RAIL
9/16" ROUND
BAR



LADDER SHALL CONFORM TO
POLYPROPYLENE ASTM D-4101
1/2" GRADE 60 REINFORCING
BAR A-615 9/16" COLD DRAWN
BAR C-1018

POLYPROPYLENE LADDER

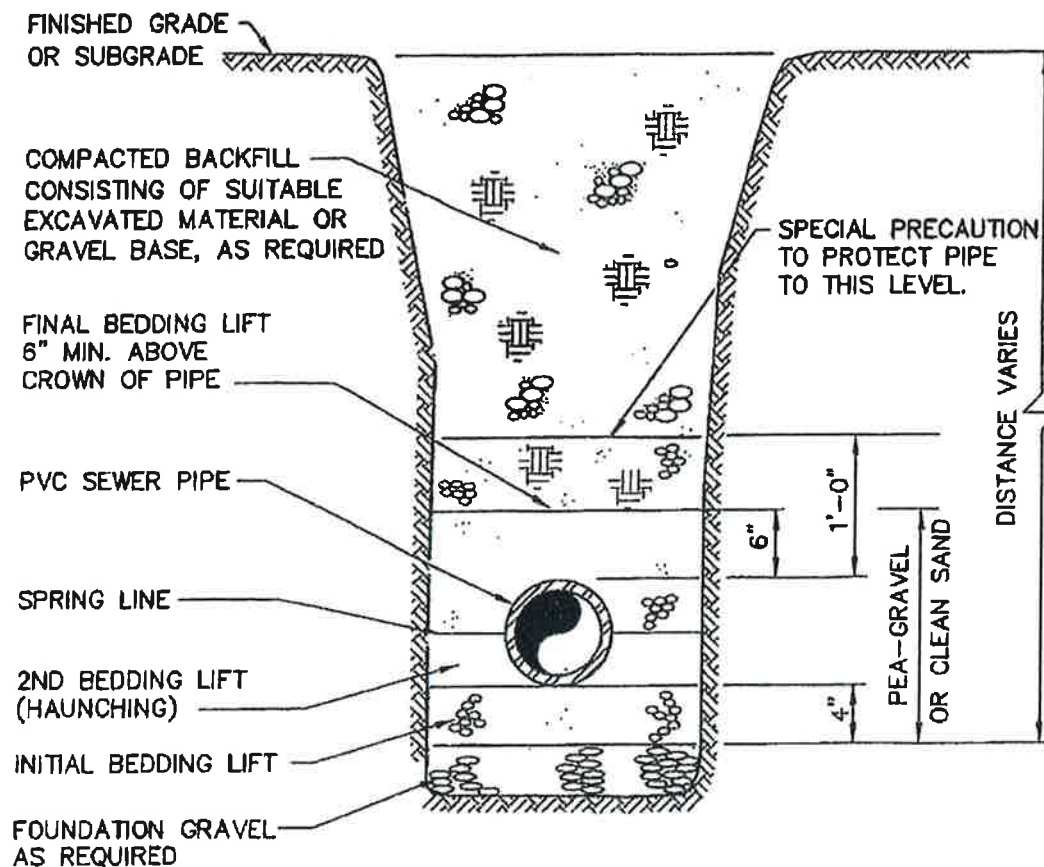
CITY OF BUCKLEY			
POLYPROPYLENE LADDER AND MANHOLE STEPS			
APPROVED: <i>Ch. B. L.</i> 1/25/17			DWG. NO. PLMHS
PUBLIC WORKS DEPT.		DATE	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE



NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A MANHOLE COUPLING INTO WALL.
D.I. PIPE: BELL AND SPIGOT JOINT OR FLEXIBLE COUPLING.
EITHER SHALL BE 12" MAXIMUM DISTANCE FROM MANHOLE WALL.
PVC AND D.I. PIPE, OPTIONAL: CORE THE MANHOLE AND
CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER
BOOT IN MANHOLE WALL, KOR-N-SEAL BOOT
OR EQUAL.
2. DROP OF GRADE THRU MANHOLE SHALL
BE 0.10', UNLESS OTHERWISE APPROVED.

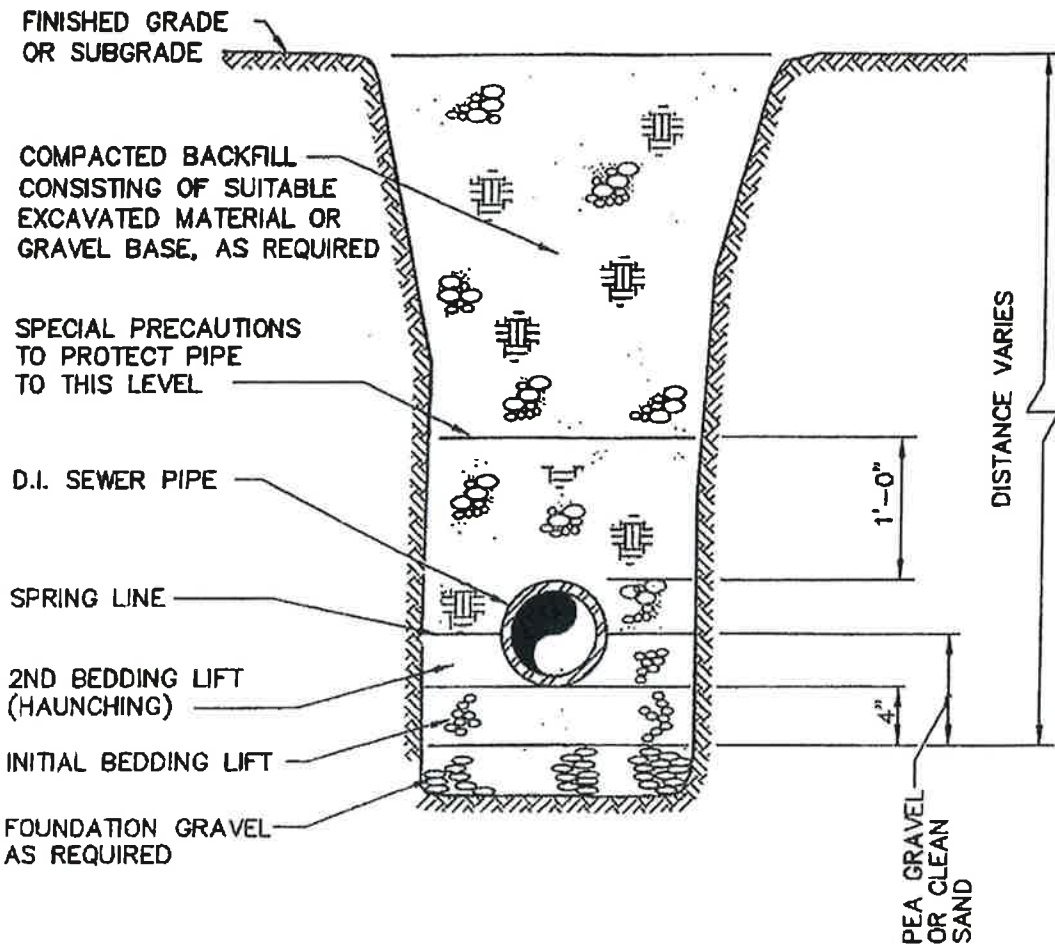
CITY OF BUCKLEY			
FORCE MAIN DISCHARGE MANHOLE			
APPROVED: <i>CL B. L.</i>		DATE 1/25/17	
PUBLIC WORKS DEPT.		DATE	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE
		DWG. NO. FMDMH	



NOTE:

BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH CITY STANDARDS AND/OR THE STATE OR COUNTY PERMIT REQUIREMENTS (AS MAY BE APPLICABLE)

CITY OF BUCKLEY			
SANITARY SEWER TRENCH SECTION FOR P.V.C. PIPE			
APPROVED: <i>CL Buck</i>		DWG. NO. SSTSPVCP	
PUBLIC WORKS DEPT.		DATE 1/25/17	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE



NOTE:

BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH CITY STANDARDS AND/OR THE STATE OR COUNTY PERMIT REQUIREMENTS, (AS BE APPLIABLE)

CITY OF BUCKLEY			
SANITARY SEWER TRENCH SECTION FOR D.I. PIPE			
APPROVED: <i>Ch. B. L.</i>		DATE 1/25/17	
PUBLIC WORKS DEPT.		DATE	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE
		DWG. NO. SSTSDIP	

FINISHED GRADE
OR SUBGRADE

COMPACTED BACKFILL CONSISTING
OF EXCAVATED MATERIAL OR
GRAVEL BASE

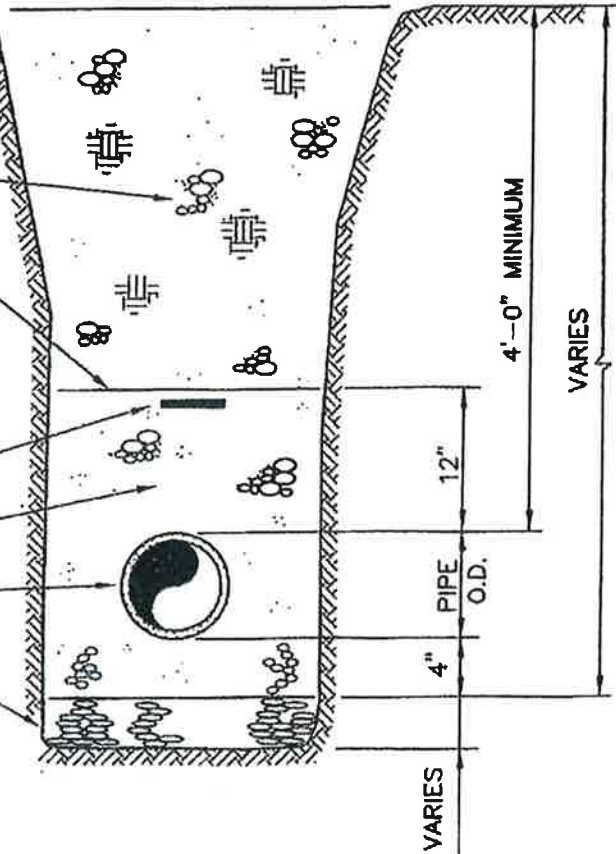
SPECIAL PRECAUTIONS TO
PROTECT PIPE TO THIS LEVEL

3" MIN. WIDTH FLOURESCENT
ORANGE IDENTIFICATION TAPE
"NON-POTABLE WASTEWATER"
TO RUN CONTINUOUS WITH PIPE

HAND-PLACED, COMPACTED
SELECT BACKFILL

DUCTILE IRON
SEWER PIPE

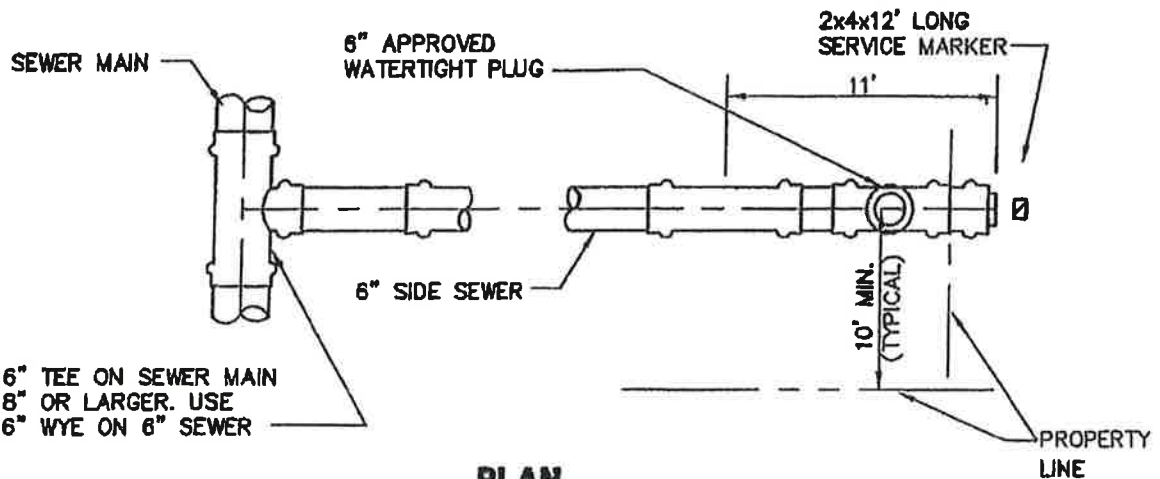
FOUNDATION GRAVEL
AS REQUIRED



NOTE:

BACKFILL MATERIAL AND COMPACTION SHALL BE
IN CONFORMANCE WITH THE CITY STANDARDS
AND/OR THE STATE OR COUNTY PERMIT
REQUIREMENTS, (AS MAY BE APPLICABLE)

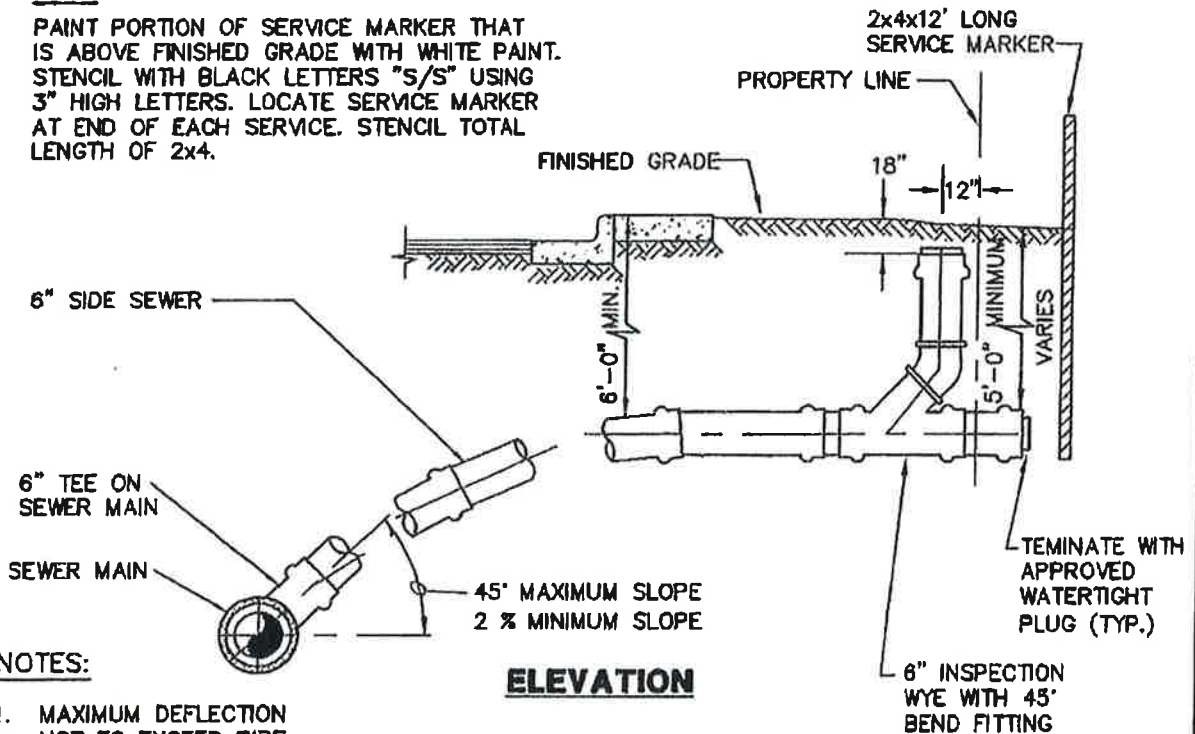
CITY OF BUCKLEY			
PRESSURE LINE AND FORCE MAIN TYPICAL TRENCH SECTION			
APPROVED: <i>Ch. B. L.</i>		DWG. NO. PLFMTTS	
PUBLIC WORKS DEPT.		DATE 11/25/17	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE



PLAN

NOTE:

PAINT PORTION OF SERVICE MARKER THAT IS ABOVE FINISHED GRADE WITH WHITE PAINT. STENCIL WITH BLACK LETTERS "S/S" USING 3" HIGH LETTERS. LOCATE SERVICE MARKER AT END OF EACH SERVICE. STENCIL TOTAL LENGTH OF 2x4.

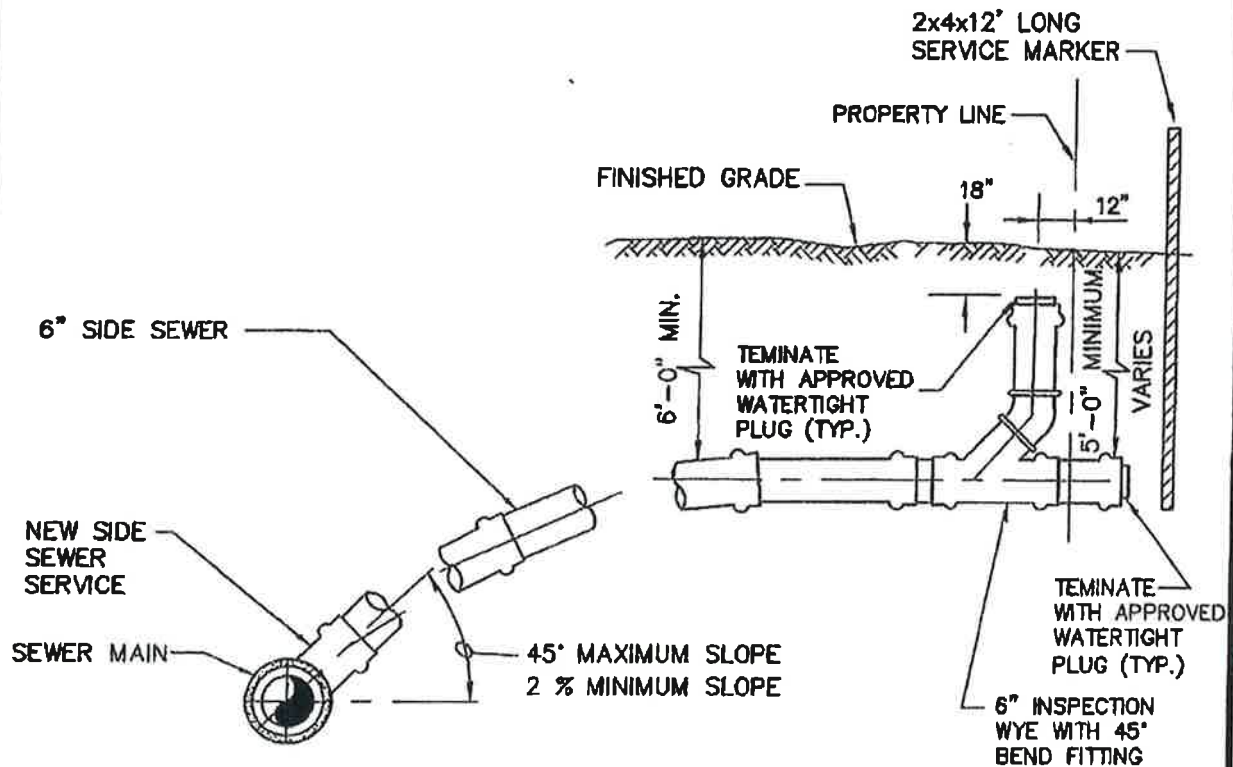


ELEVATION

NOTES:

1. MAXIMUM DEFLECTION NOT TO EXCEED PIPE MANUFACTURER RECOMMENDATIONS.
2. SIDE SEWER LATERAL SHALL BE THE SAME MATERIAL AS THE MAIN LINE SEWER AND BEDDED THE SAME
3. PIPE TO BE BEDDED IN PEA GRAVEL.

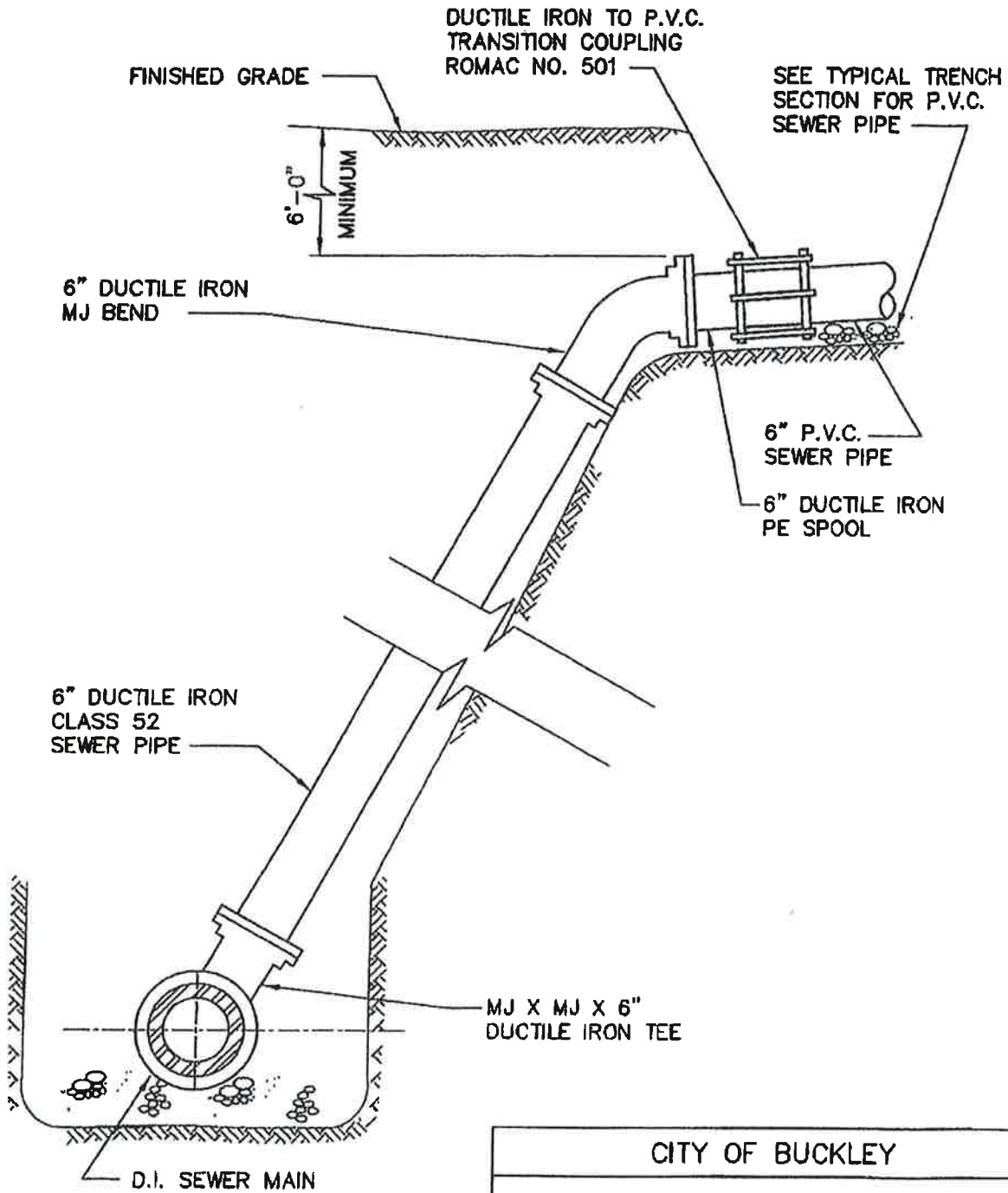
CITY OF BUCKLEY			
TYPICAL SIDE SEWER DETAIL (WITHIN NEW DEVELOPEMENT)			
APPROVED: <i>Cl B</i>		1/25/17	DWG. NO.
PUBLIC WORKS DEPT.		DATE	TSSD
DATE: 8/96	DRWN: J.H.	CHKD: T.J.O.	SCALE: NONE



NOTE:

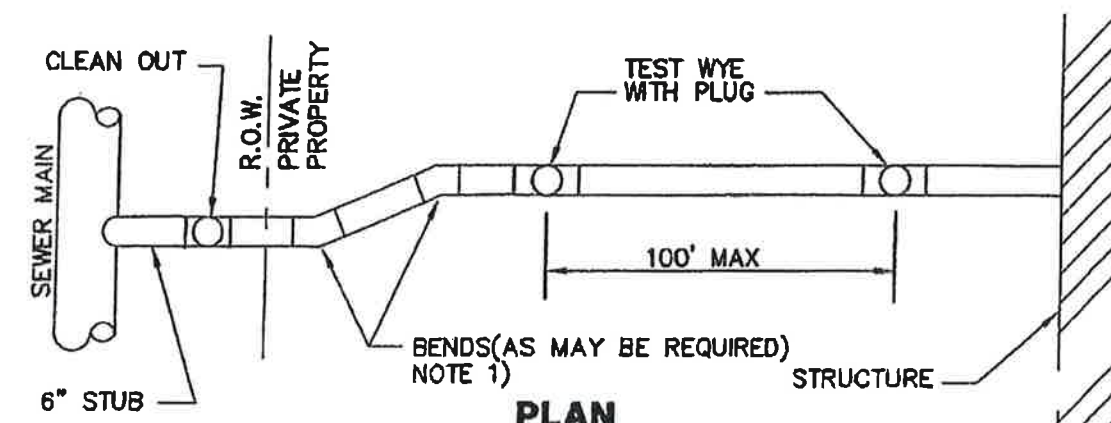
1. PAINT PORTION OF SERVICE MARKER THAT IS ABOVE FINISHED GRADE WITH WHITE PAINT. STENCIL WITH BLACK LETTERS "S/S" USING 3" HIGH LETTERS. LOCATE SERVICE MARKER AT END OF EACH SERVICE. STENCIL TOTAL LENGTH OF 2x4.
2. TAP EXISTING SEWER MAIN WITH APPROVED CITY SADDLE. INSTALL NEW SIDE SEWER TEE ON NEW MAIN LINES.
3. WHEN TAPPED SERVICE IS PERMITTED, CONTRACTOR SHALL PROVIDE SEWER MAIN COUPON TO CITY STAFF.
4. SEE "TYPICAL SIDE SEWER DETAIL" FOR CONSTRUCTION IN NEW DEVELOPMENTS.
5. PROVIDE PEA GRAVEL PIPE BEDDING SEE TRENCH SECTION DETAIL.

CITY OF BUCKLEY			
NEW SIDE SEWER SERVICE (WITHIN EXISTING STREET RIGHT-OF-WAY)			
APPROVED: <i>Ch. B.</i>		DATE <i>1/25/17</i>	
PUBLIC WORKS DEPT.		DATE	
DATE: 8/96	DRWN: J.H.	CHKD: T.J.O.	SCALE: NONE
			DWG. NO. SSD

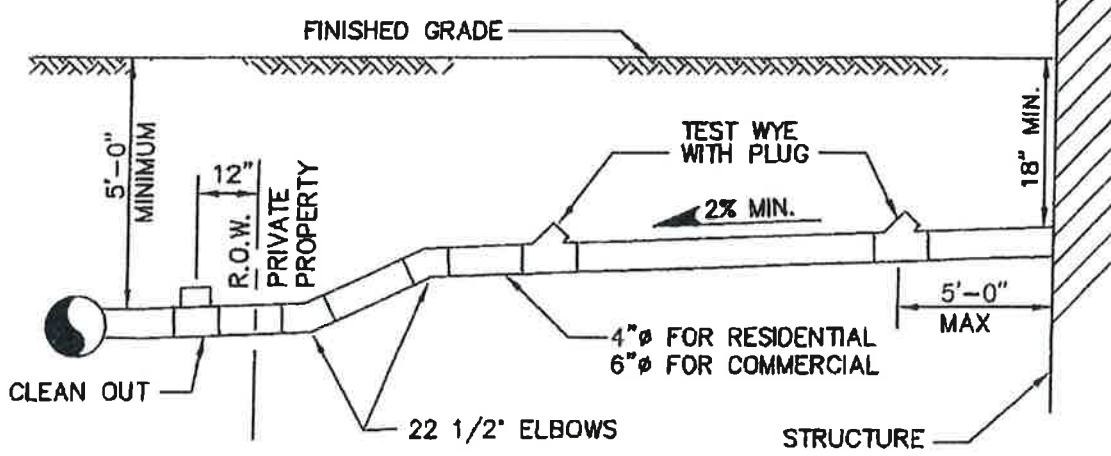


NOTE:
SEE TYPICAL TRENCH SECTION
FOR DUCTILE IRON SEWER PIPE

CITY OF BUCKLEY			
STANDING SIDE SEWER			
APPROVED: <i>Ch B.L.</i>		DATE 1/25/17	DWG. NO. SSS
PUBLIC WORKS DEPT.		DATE	
DATE: 7/95	DRWN: S.L.B.	CHKD: T.J.O.	SCALE: NONE



PLAN

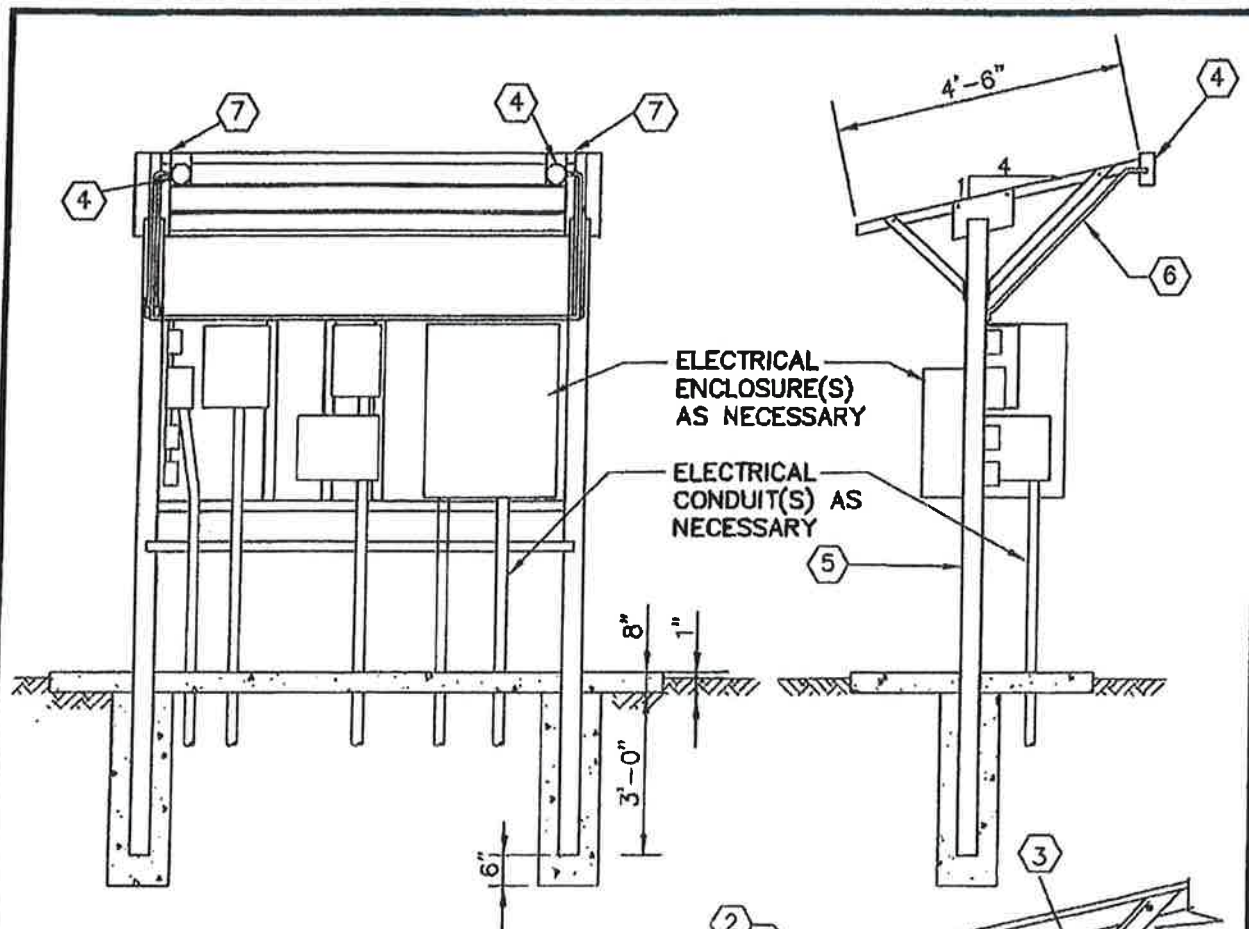


ELEVATION

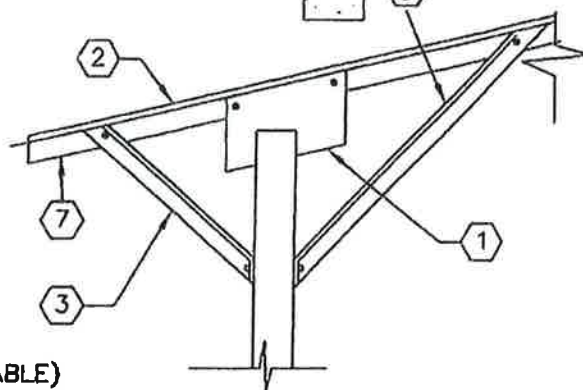
NOTES:

1. ELBOWS SHALL NOT BE GREATER THAN 45°
2. CLEAN OUT IS REQUIRED FOR EACH PIPE LENGTH GREATER THAN 100' AND FOR EACH 90° ACCUMULATED ELBOW/100'
3. RIGHT-OF-WAY RESTORATION SHALL MATCH OR EXCEED THE ORIGINAL CONDITION.
4. BACKFILL FOR PAVED AREA SHALL BE 5/8" MINUS CRUSHED SURFACING TOP COURSE, COMPACTED IN 12" LIFTS
5. ALL PLUMBING OUTLETS SHALL BE CONNECTED TO THE SEWER. NO DOWNSPOUTS OR STORM DRAINAGE MAY BE CONNECTED TO THE SEWER SYSTEM.
6. 18" MINIMUM COVERAGE OF PIPE
7. 6" MINIMUM COVERAGE AT PROPERTY LINE
8. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH AN ELBOW OR WYE. 90° CHANGE WITH AN ELBOW AND WYE.
9. 6" SEWER PIPE MINIMUM SIZE IN RIGHT-OF-WAY 2% MINIMUM GRADE, 45% MAXIMUM.
10. 4" SEWER PIPE MINIMUM SIZE ON PRIVATE RESIDENTIAL PROPERTY, 6" SEWER PIPE MIN. SIZE ON COMMERCIAL PROPERTIES. 2% MINIMUM GRADE, 45° MAXIMUM.
11. CONSTRUCTION IN RIGHT-OF-WAY SHALL BE PERFORMED BY A REGISTERED LICENSED CONTRACTOR.
12. ALL CONSTRUCTION REQUIRES A PERMIT AND PAYMENT OF FEE. COMPLETE LEGAL DESCRIPTION OF PROPERTY AND DIMENSIONS.
13. AS-BUILT DRAWING SHOWING LOCATION OF SIDE SEWER IN RELATION TO THE HOUSE IS REQUIRED AFTER INSTALLATION.

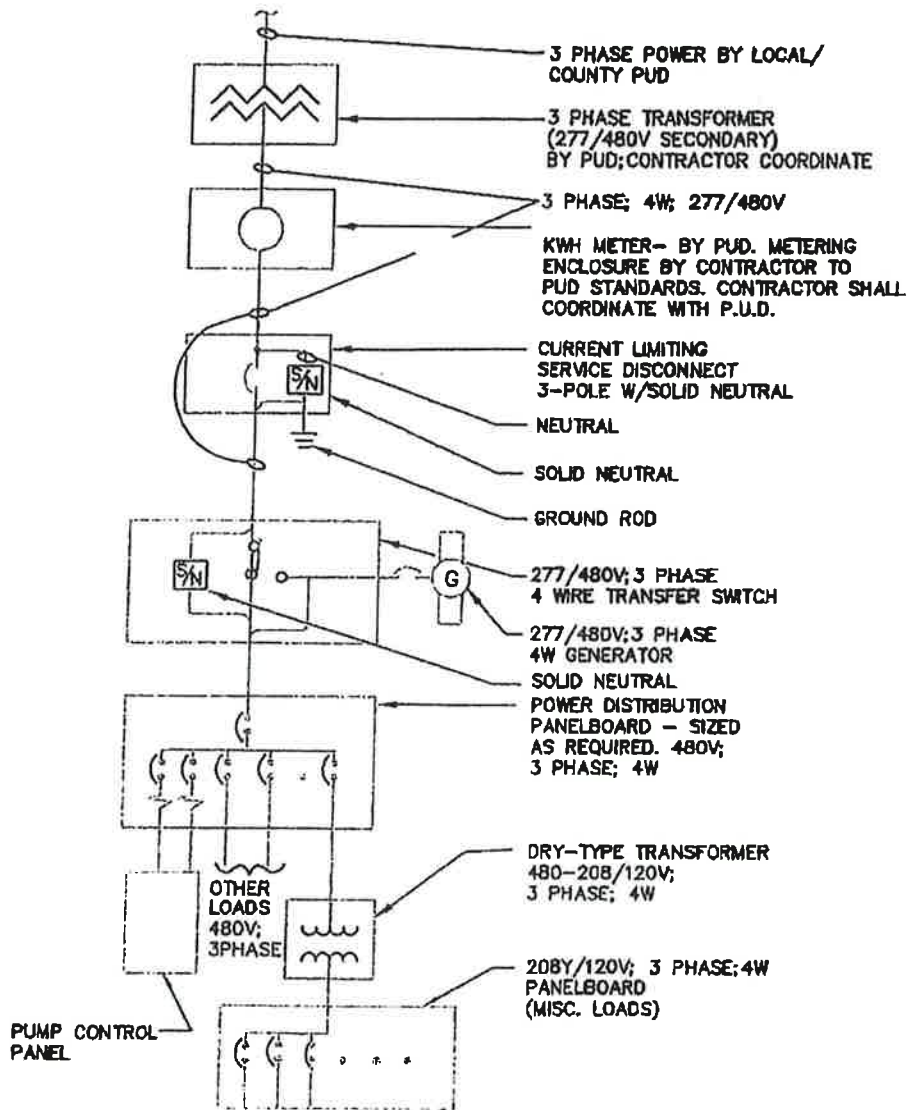
CITY OF BUCKLEY			
PRIVATE SIDE SEWER INSTALLATION			
APPROVED: <i>CLBL</i>		DATE <i>1/25/17</i>	
PUBLIC WORKS DEPT.		DATE	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE
DWG. NO. PSSI			



- ① GALVANIZED STEEL PLATE 8x14x1/4"
- ② 24 GAGE METAL ROOFING MATERIAL, PAINTED, OVERHANG ALL SIDES.
- ③ 2X2 GALV. STEEL ANGLE
- ④ LIGHT FIXTURE, 2 SETS, WEATHER PROOF CAST ALUMINUM BOX AND COVER
2 150 WATT FLOOD LIGHTS EACH (ADJUSTABLE)
- ⑤ 6" I.D. ELECTRICAL GALV. CONDUIT (SCHEDULE 40)
CLOSED TOP (WELDED)
- ⑥ ELECTRICAL CONDUIT, 3/4" GALV.
- ⑦ 2-1/2" SQUARE TUBE STEEL, 1/4" WALL WITH 4 ROOF SUPPORT STRINGERS.



CITY OF BUCKLEY			
ROOF STRUCTURE FOR ELECTRICAL ENCLOSURE			
APPROVED: <i>ALB</i>		DWG. NO. RSEE	
PUBLIC WORKS DEPT.		DATE 1/25/17	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE



CITY OF BUCKLEY

LIFT STATION ELECTRICAL SCHEMATIC 3PHASE, 277Y/480V POWER

APPROVED:

Ch B.L.

1/25/17

DWG. NO.

LSES

PUBLIC WORKS DEPT.

DATE

DATE:

7/95

DRWN:

S.L.B.

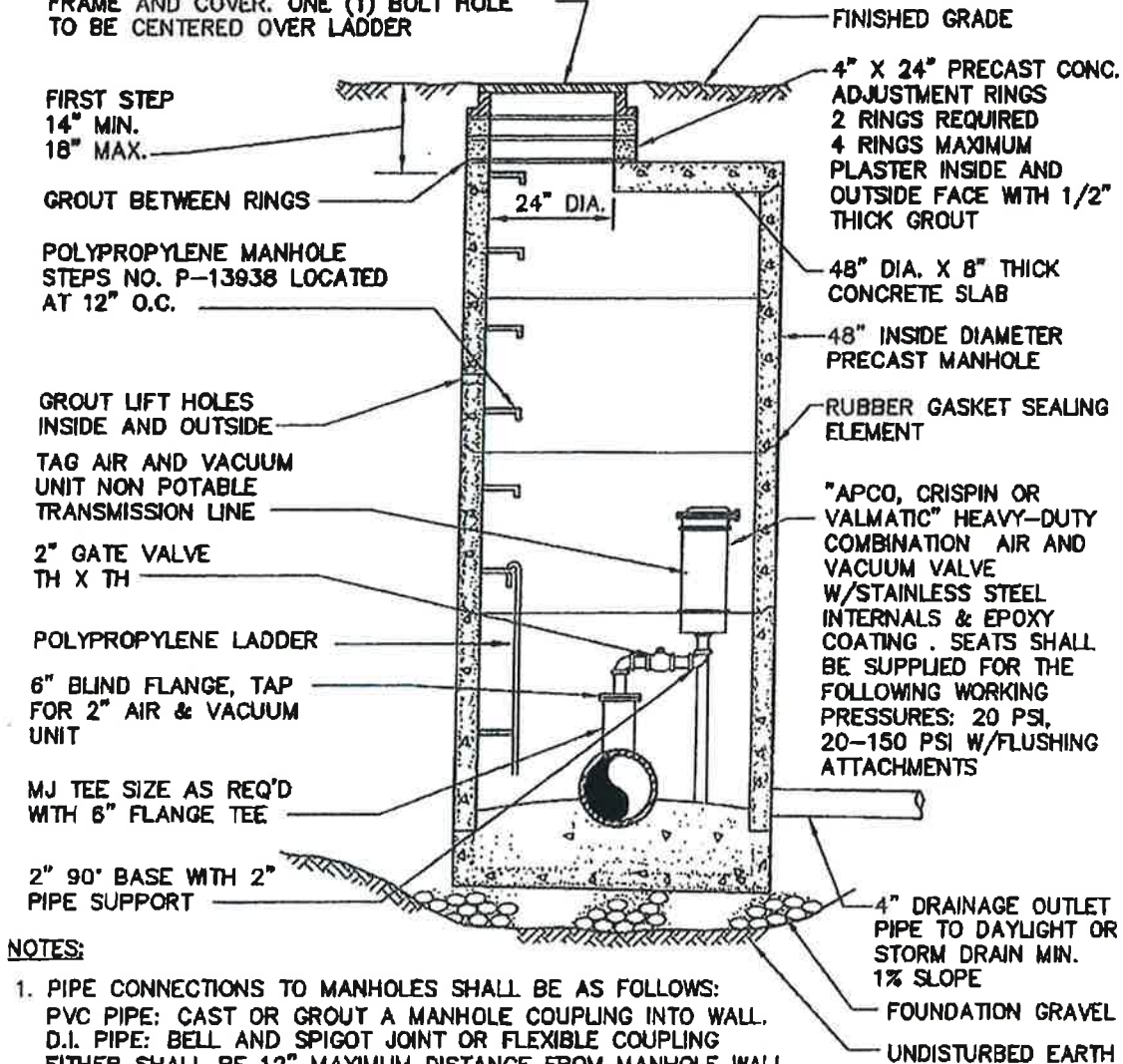
CHKD:

T.J.O.

SCALE:

NONE

MANHOLE FRAME & COVER WITH "SEWERS"
CAST ON COVER WITH 3" HIGH RAISED
LETTERS (NON-SKID PATTERN) AS
MANUFACTURED BY "SATHER MANUFACTURING
CO., INC." NO. 6024-R. 3 HOLE LOCKING
FRAME AND COVER. ONE (1) BOLT HOLE
TO BE CENTERED OVER LADDER



NOTES:

1. PIPE CONNECTIONS TO MANHOLES SHALL BE AS FOLLOWS:
PVC PIPE: CAST OR GROUT A MANHOLE COUPLING INTO WALL.
D.I. PIPE: BELL AND SPIGOT JOINT OR FLEXIBLE COUPLING
EITHER SHALL BE 12" MAXIMUM DISTANCE FROM MANHOLE WALL.
PVC AND D.I. PIPE, OPTIONAL: CORE THE MANHOLE AND
CONNECT SEWER PIPE WITH A WATER TIGHT FLEXIBLE RUBBER
BOOT IN MANHOLE WALL, KOR-N-SEAL BOOT,
HEAVY DUTY SAND COLLAR, OR EQUAL
2. DROP OF GRADE THRU MANHOLE SHALL
BE 0.10', UNLESS OTHERWISE APPROVED.

CITY OF BUCKLEY

AIR & VACUUM RELEASE ASSEMBLY

APPROVED:

Chris B. L.

1/25/17

DWG. NO.

AVRA

PUBLIC WORKS DEPT.

DATE

DATE:

8/93

DRWN:

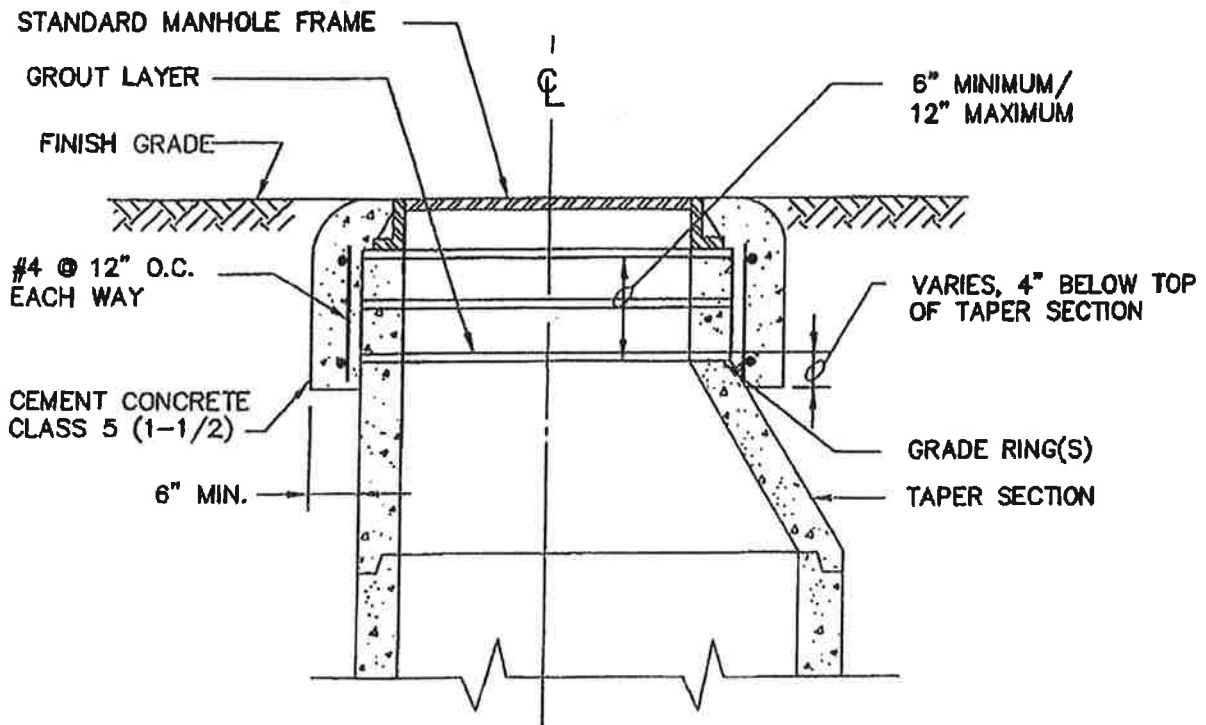
E.S.T.

CHKD:

T.J.O.

SCALE:

NONE



SECTION

NOTE:

CONSTRUCT CONCENTRIC CONCRETE COLLARS AROUND ALL MANHOLE FRAMES LOCATED OUTSIDE OF PAVEMENT AREAS

MANHOLE FRAME COLLAR

CITY OF BUCKLEY			
MANHOLE FRAME COLLAR			
APPROVED: <u>CLRL</u>		1/25/17	DWG. NO. MHCLAR
PUBLIC WORKS DEPT.		DATE	
DATE: 8/93	DRWN: E.S.T.	CHKD: T.J.O.	SCALE: NONE

APPENDIX I

2018 BIOSOLID ANNUAL REPORT

BUCKLEY WWTP

Facility ID: 153 **Facility Type:** Biosolids Management

Physical Address: 600 HATCH ST, BUCKLEY, WA 98321 **County:** Pierce

Give a brief description of your biosolids management practices.

Biosolids wasted from the wastewater treatment system are stored in an aerated holding tank then dewatered using a belt filter press to an average 13.18 % solids then loaded into a trailer provided by Tennelco Services, which then transports the solids to its Beneficial Use Facilities in Central Washington.

Did you begin the reporting year with any biosolids/products stored on site from a previous calendar year?

☐ Yes ☒ No

Did you end the reporting year with any biosolids stored on site?

☐ Yes ☒ No

Did you receive biosolids (not septage) from any other facility during 2018?



☐ Yes ☒ No

Did you receive any septage during 2018?

☐ Yes ☒ No

Biosolids Management Activities

How many dry tons of biosolids did you produce during 2018? 106.80

Did you apply biosolids directly to a site specifically permitted for your facility, or sell or give away any Exceptional Quality biosolids?

☐ Yes ☒ No

Did you send any biosolids off site to another permitted facility, or were any of your biosolids incinerated?

☒ Yes ☐ No

(i) Do not include biosolids you apply directly to a site specifically permitted for your facility, or Exceptional Quality biosolids you sold or gave away.

(ii) Provide the name of the facility, permit number, and dry tons or gallons transferred.

(iii) List all destinations separately.

What did you do with your biosolids?

Type	Facility Name 	Permit Number	Dry Tons
Sent to a facility for further treatment	TENELCO INC.	BT0101	106.80

Number of pollutant monitoring events during the reporting year 1

Pollutants Exceeding Table 1 Value

☐ As
 ☐ Cd
 ☐ Cu
 ☐ Hg
 ☐ Mo
 ☐ Ni
 ☐ Pb
 ☐ Se
 ☐ Zn

Pollutants Exceeding Table 3 Value

☐ As
 ☐ Cd
 ☐ Cu
 ☐ Hg
 ☐ Mo
 ☐ Ni
 ☐ Pb
 ☐ Se
 ☐ Zn

How did you comply with pathogen reduction requirements?

Class A

Class B

☐ Alternative 1 (time/temperature)

☐ Alternative 2

(pH/time/temperature/% solids)

Alternative 3 (process to further
reduce pathogens [PFRP])

☐ Composting

☐ Heat treatment

☐ Heat drying

☐ Pasteurization

☐ Beta ray irradiation

☐ Gamma ray irradiation

☐ Thermophilic aerobic
digestion

☐ Alternative 4 (PFRP equivalent)

☐ Requirement does not apply

☐ Did not meet requirement(s)



Alternative 1 (7 samples)

Alternative 2 (process to significantly
reduce pathogens [PSRP])



Aerobic digestion



Air drying



Anaerobic digestion



Composting



Liming



Alternative 3 (PSRP equivalent)

How did you comply with vector attraction reduction requirements?

☐ Alternative 1 (38% volatile solids reduction)

☐ Alternative 1a (bench test-anaerobic)

☐ Alternative 1b (bench test-aerobic)

☐ Alternative 2 (SOUR)

☐ Alternative 3 (aerobic process)

☐ Alternative 4 (pH stabilization)

☐ Alternative 5 ($\geq 75\%$ solids)

☐ Alternative 6 ($\geq 90\%$ solids)

☐ Alternative 7 (injection)

☒ Alternative 8 (incorporation)

☐ Requirement does not apply



Did not meet requirement(s)

Attached Files**Signature Authority**[Dave Schmidt Signature Delegation to Jim Doty.pdf](#) Uploaded: 2019-06-25**Monitoring and Analytical Data**[18a18401 coc biosolids #1 10.4.18.pdf](#) Uploaded: 2019-06-25[18a18527 coc biosolids #2 10.8.18.pdf](#) Uploaded: 2019-06-25[18a19263 coc biosolids #3 10.22.18.pdf](#) Uploaded: 2019-06-25[18a19284 coc biosolids #4 10.23.18.pdf](#) Uploaded: 2019-06-25[18a19718 coc biosolids #5 10.30.18.pdf](#) Uploaded: 2019-06-25[18a19947 coc biosolids #6 11.5.18.pdf](#) Uploaded: 2019-06-25[18a20718 coc biosolids #7 11.20.18.pdf](#) Uploaded: 2019-06-25[B18-A018401 results Biosolids #1 \(fecal\).pdf](#) Uploaded: 2019-06-25[B18-A018527 results biosolids #2 \(fecal\).pdf](#) Uploaded: 2019-06-25[B18-A019263 results biosolids #3 \(fecal\).pdf](#) Uploaded: 2019-06-25[B18-A019284 results biosolids #4 \(fecal\).pdf](#) Uploaded: 2019-06-25[B18-A019718 results biosolids #5 \(fecal\).pdf](#) Uploaded: 2019-06-25[B18-A019947 results biosolids #6 \(fecal\).pdf](#) Uploaded: 2019-06-25[B18-A020718 results biosolids #7 \(fecal and PP\).pd](#) Uploaded: 2019-06-25[QCB18-A018401 biosolids #1 QC.pdf](#) Uploaded: 2019-06-25[QCB18-A018527 biosolids #2 QC.pdf](#) Uploaded: 2019-06-25[QCB18-A019263 biosolids #3 QC.pdf](#) Uploaded: 2019-06-25

[QCB18-A019284 biosolids #4 QC.pdf](#) Uploaded: 2019-06-25

[QCB18-A019718 biosolids #5 QC.pdf](#) Uploaded: 2019-06-25

[QCB18-A019947 biosolids #6 QC.pdf](#) Uploaded: 2019-06-25

[QCB18-A020718 biosolids #7 QC.pdf](#) Uploaded: 2019-06-25

Other Information

[biosolids Fecal Coliform Calculations 2018.pdf](#) Uploaded: 2019-06-25

[Biosolids Handling Ledger 2018.pdf](#) Uploaded: 2019-06-25

This form is prepared by

Name: Doty, James
Email: jdoty@cityofbuckley.com
Phone: (360) 761-7881

This form is submitted by

I understand that the proper signatory is the responsible official as identified under [WAC 173-308-310 \(10\)](#) **Signatories to permit applications and reports**, and is responsible for the content of this annual report when it is submitted. I declare that:

- ☐ I am the responsible official as described in [WAC 173-308-310\(a\)](#)
- ☒ I am the duly authorized signatory for this report in accordance with [WAC 173-308-310\(b\)](#)
- ☐ I am not the responsible official but am submitting this report with the full knowledge and approval of the responsible official

Responsible Official Name: David Schmidt Title: City Administrator
Submitted By: Doty, James
Submitted Date: 6/25/2019