# 7 UTILITIES

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# I. PURPOSE OF THE UTILITIES ELEMENT

This utilities element has been developed in accordance with Section 36.70A.070 of the Growth Management Act (GMA) to address utility services in the City of Buckley and the surrounding Planning Area. The GMA requires all Comprehensive Plans to include a utilities element consisting of the general locations, proposed locations, and capacities of all

existing and proposed utilities. The utilities element represents the community's policy plan for growth over the next 20 years (the year 2035 has been used for the Buckley Comprehensive Plan). The utilities element describes how the goals in the other plan elements will be implemented through utility policies and regulations, and is an important element in implementing the comprehensive plan.

The GMA also contains requirements pertaining to the important concept of concurrency. Concurrency means that jurisdictions must be able to demonstrate that all public facilities, including roads, can be made available for all new development at the time such development is constructed. This is a sometimes overlooked, but very critical part of the GMA. Plans for making those utilities available when the development is built must include a financing plan. Thus, while the capital facilities, land use, and transportation elements of this Comprehensive Plan describe other issues relevant to meeting the concurrency requirements of the GMA, this utilities element represents an important part of the plans needed to meet the concurrency of GMA.

The utilities element also has been developed in accordance with county wide planning policies, and has been integrated with all other planning elements to ensure consistency throughout the comprehensive plan. The utilities element considers the general location, proposed location, and capacity of existing and proposed utilities, including water, sewer, surface water drainage, natural gas, electricity, and communications.

The utilities element includes:

- Introduction
- Inventory and Analysis
- Future Needs and Alternatives
- Goals, Objectives, and Policies

## URBAN GROWTH AREA

The Urban Growth Area (UGA) boundary was selected in order to ensure that urban services, including utilities, can be made available to all development. This includes the provision of future utility facilities. The City will incorporate plans into its comprehensive planning efforts in order to identify ways of improving the quality and delivery of services provided in the City and its designated urban growth area boundary.

All development requiring urban growth services will be located in the Urban Growth Area, and will have these services extended to them in a timely and financially feasible manner. The utility plan in this element will guide decision making to achieve the community goals as articulated in the vision statement.

## FEDERAL AND STATE LAWS AND REGULATIONS

### Revised Codes of Washington and Washington Utilities and Transportation Commission

Utilities and transportation are regulated in Washington by the Washington Utilities and Transportation Commission (WUTC). The WUTC, composed of three members appointed by the governor, is empowered to regulate utilities (including, but not limited to, electrical, gas, irrigation, telecommunications, and water companies). State law (WAC 480-120) regulates the rates and charges, services, facilities, and practices of utilities.

The WUTC requires gas providers to demonstrate that existing ratepayers will not subsidize new customers. Thus, historically gas main extensions have not been planned in advance but have been initiated only when there is sufficient customer demand.

### Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) is an independent five-member commission within the U.S. Department of Energy. FERC establishes rates and charges for the interstate transportation and sale of natural gas, for the transmission and sale of electricity, and the licensing of hydroelectric power projects. In addition, the Commission establishes rates or charges for the interstate transportation of oil by pipeline.

### Natural Gas Policy Act of 1978

The central theme of the National Gas Policy Act (NGPA) is encouragement of competition among fuels and supplies across the country. As a result, natural gas essentially has been decontrolled. The NGPA also contained incentives for developing new natural gas resources and a tiered pricing structure aimed at encouraging the development of nation-wide transmission pipelines.

### Northwest Power Planning Council

The Northwest Power Planning Council (NWPPC) focuses on the generation of electricity; however, its policies have implications for gas, too. The NWPPC has directed the region to develop cogeneration as an energy resource and hydro firming as a power back-up system.

Cogeneration is the use of heat, as a byproduct of power generation, for industrial processes or for space and water heating. Natural gas is often used as a fuel source for cogeneration.

Hydro firming is the back up of the region's intermittent excess spring hydro generation with gas-fired combustion turbines to provide back-up if hydroelectric power generation is below normal levels.

These two policies could have a major impact on natural gas consumption in the northwest. However, natural gas for heating purposes is up to 50 percent more efficient than generating electricity with gas, for the same heating function. The most efficient use of natural gas, interior heating and water heating, can contribute to a balanced regional energy policy.

### 1991 Clean Air Amendments

The passage of the Washington State Clean Air Act in 1991 indicates the state's intent to promote the diversification of fuel sources for motor vehicles. This is in response to a need to both reduce atmospheric emissions and reduce the nation's reliance on gasoline for strategic reasons. It also studies the potential and encourages the development of natural gas vehicle refueling stations.

# II. INVENTORY AND ANALYSIS

## INVENTORY

The inventory presented in this element provides information useful to planning. The inventory summarizes general information pertaining to the existing utility service system in the City. Many public and private agencies are involved in regulating, coordinating, producing, delivering, and supplying utility services. This section of the element identifies those providers as well as the legislation regulating the utility. The inventory includes:

**City-Owned Utilities**

- Water
- Sewer
- Surface water drainage

**Privately- or County-Owned Utilities**

- Natural Gas
- Electrical
- Telecommunications
- Solid waste

Water service to some areas within the urban growth boundary is provided by other purveyors. These are discussed within the Water System section.

Buckley owns and operates its sewage collection and treatment system, water supply system, and surface water drainage system. Natural gas, electricity, telecommunications, and solid waste collection systems are owned and operated by private companies. Solid waste disposal is managed by Pierce County, which operates the county landfill.

# III. WATER SYSTEM

The City of Buckley currently maintains approximately 1,700 water service connections, which consist of both commercial and residential hookups. The City charges for water service on a monthly basis. Monthly water rates consist of a monthly base charge plus a

consumption rate. The monthly base charge varies by meter size and covers usage up to 200 cubic (1,496 gallons) per month. The consumption rate applies to consumption in excess of 200 cubic feet per month, and increases with increasing consumption. This rate structure is an increasing block rate structure, where successive block of consumption are charged at increasing rates.

The 2017 water usage records indicate that a total volume of just under 200 million gallons was consumed by the City's service population. This total included both residential and commercial usage, the residential usage accounts for 55 percent of the total. The estimated average per capita demand for the six-year period, 2012 through 2017, is 60 gallons per capita per day (gpcd). This average consumption figure established does not include adjustments for commercial and/or public facility usage. This exclusion inflates the average per capita consumption figures.

## SOURCE AND SUPPLY

### Level of Service

The water system quality shall be in compliance with Washington Administrative Code (246-290) requirements for water quality.

The source capacity shall equal or exceed the design maximum demand rate plus that rate necessary to replace fire suppression storage within 72 hours.

Fire flow service shall be provided to insurance services office (ISO) standards for Class 6 fire protection facilities.

### Inventory of System

The water utility currently receives approximately 64 percent of its supply from South Prairie Creek, which is located to the south and east of existing city limits. Water is delivered from the Creek via a 29,200-foot transmission main to the Slow Sand Filter Water Treatment Plant (WTP) and 2.3 million gallon reservoir. The City and Rainier School jointly own the water transmission main from South Prairie Creek. The City owns the Slow Sand Filter WTP and reservoir, while Rainier School owns the land where the WTP and reservoir are located. The City and Rainier School retain separate ownership of their respective water distribution systems. An agreement was signed in May 1996 between the City and the Department of Social and Health Services delineating the entities retention of ownership of their respective water rights and those facilities specific to the operation of their systems. The City of Buckley and Rainier School have water rights issued by the Washington Department of Ecology (WDOE) for a total instantaneous right of 5.02 cfs (2,252 gpm) for municipal consumption purposes and 3.0 cfs (1,347 gpm) for irrigation. The total annual water right for the City and Rainier School is 1,746 acre-feet for consumption and 400 acre-feet for irrigation. Source production capacity is based upon the limiting factor between water right limits and physical water production limits, such as pumping and treatment capacities. The instantaneous production capacity for the City of Buckley and Rainier School is 1,870 gpm.

On an instantaneous basis, the City's existing water system production capacity will be exceeded by maximum day demands by the year 2025. The transmission main from South Prairie Creek to the WTP has a capacity of between 900 and 1,000 gpm. The WTP operated at a filter-loading rate of 0.085 gpm/sq ft has a treatment capacity of 725 gpm. The Prairie Creek watershed is owned by the U.S. Forest Service, Longview Timberlands LLC, Muckleshoot Federal Corporation, Muckleshoot Indian Tribe, Manke Timber Co., Hancock Forest Management, Frank and Marina Wallace, and Edward Hudson. The City has obtained agreements from all of these parties restricting activities that might have adverse impacts on water quality, but does not prohibit use within the watershed. The watershed area is relatively inaccessible except for a few unimproved roads, and the City restricts access along its service road to the headworks.

In addition to South Prairie Creek, the City has several groundwater sources that are utilized to supplement South Prairie Creek or as backup sources. The following groundwater sources provide approximately 36 percent of City's water demands. Inventories of these wells are provided below.

*Well No. 2*

Well No. 2 located adjacent to and east of the City limits on the east side of Levesque Road, north of Second Avenue. This well has an 8-inch diameter casing and is finished to a depth of 170 feet below ground surface (bgs). The capacity of this well is 130 gpm. Water from this well can be pumped either to the slow sand filter system or directly to the reservoir via a 6-inch water transmission main. The water from this well is available to be chlorinated with gas chlorine on site.

*Well No. 3*

Well No. 3 also located just east of city limits was drilled with a 6-inch casing alongside Well No. 2 to investigate the production capacity of an upper aquifer encountered at a depth of 60 feet. This well is currently used as an observation well. There are no plans to use this well as a water supply source for the City.

*Well No. 4*

In order to take advantage of the apparent high production capacity of the upper aquifer encountered by Well No. 3, Well No. 4 was drilled approximately 100 feet away. This well has a 16-inch diameter casing and is finished to a depth of 70 feet bgs. The capacity of this well is 240 gpm. Water from this well can be pumped either to the slow sand filter system or directly to the reservoir via a 6-inch AC water transmission main. The water from this well is available to be chlorinated with gas chlorine on site.

*Well No. 1 (Naches Street Well)*

The Naches Street Well, located on the west side of Naches Street (just north of Wheeler Street), was placed into service in 1967. This well has a 10-inch diameter casing and is

finished to a depth of 130 feet bgs. The capacity of this well is 260 gpm. The water from this well is chlorinated with gas chlorine on site, and pumped directly into the water distribution system.

*Well No. 5 (Rainier School Well*

This well is finished to a depth of 180 bgs. The capacity of this well is 215 gpm. Water from this well can be pumped either to the slow sand filter system or directly to the reservoir via a 6-inch AC water transmission main. The water from this well is not available to be chlorinated on site.

*Well No. 6 (Trail Well No. 1)*

This well was drilled in 2005 as a test well to determine how much water could be available at the site located south of town along SR 165, near the Foothills Trail. The well was drilled to a depth of 197 feet, has a 6-inch casing to 135 feet and a 6-inch telescoping, 30-slot screen, installed from 135 feet to 155 feet. The well was operates at a capacity of 90 gpm. Due to an elevated level of manganese, a filtration system, using pyrolusite material has been installed at the well. The water from this well is chlorinated with gas chlorine on site.

*Well No. 7 (Trail Well No. 2)*

This well is located approximately 60 feet north of Well No. 6. The well was drilled to a depth of 163 feet, has a 12-inch casing extending to 125, feet and a 12-inch telescoping 100-slot screen extending from 125 to 140 feet. The well was operates at a capacity of 205 gpm. Due to an elevated level of manganese, a filtration system, using pyrolusite material has been installed at the well. The water from this well is chlorinated with gas chlorine on site.

*Well System Operations*

Water produced from Wells No. 2, 4, and the Rainier School Well can be directed through the slow sand filter or pumped directly into the reservoir. These wells have their own chlorination system prior to entering the reservoir. The Naches Street Well and the two Trail Wells also have their own chlorination systems and water from these wells is pumped directly into the distribution system. Low water levels in the reservoir call the wells sequentially, as the reservoir level decreases. As water level in the reservoir increases, the wells are deactivated in the reverse sequence.

As a part of the above noted source of water, the City currently maintains an emergency intertie with the City of Tacoma. The intertie includes a booster station and is located to along SR-410 near the Post Office.

The locations of these sources are indicated in Figure W1.

**Forecast of Future Needs**

Based on the above noted supply rates and the anticipated population growth rate within the urban growth area boundaries, maximum day demands will exceed source capacity by 2025. Additional source capacity will be obtained through modifications to the slow sand filter and development of additional groundwater sources.

The City should be cognizant of the fact that future water sources may yet be required and that the securing of additional rights would be beneficial and consistent to their extended growth plans.

The following project descriptions are provided as a brief outline to source water improvements, which will be suggested to support the anticipated future development and maintain adequate water service to existing development within the urban growth area boundary.

S-1. Slow Sand Filter Re-Sand Pilot Study to test the effectiveness of increasing the loading rate.
S-2. Re-Sand Slow Sand Filter at the Water Treatment Plant.
S-3. Expand Slow Sand Filter Water Treatment Plant-construct additional filter bed area; expand filter building, additional inlet and under-drain piping, site piping and controls.
S-4. Hydro-Geologic Study for a New Well- complete a hydro-geologic study to obtain recommendations of locations that would be most likely to support productive wells.
S-5. Drill and Test New Well.

## TREATMENT

### Level of Service

The treatment of potable water shall be provided to comply with the standards as set by the Federal Safe Drinking Water Act (SDWA) and the Surface Water Treatment Rule (SWTR).

### Inventory System

The water system includes a slow sand filter water treatment plant to provide surface water treatment. The filtration plant has an available filter surface area of 8,500 square feet. The plant is currently operated at a treatment capacity of 725 gpm. The water is chlorinated with gas chlorine after filtration and before entering the on-site storage reservoir. Chlorine contact time is provided in the reservoir.

Water produced from Wells 2, 4, and 5 can be directed through the slow sand filter, or they can be pumped directly into the reservoir. Gas chlorination is available at Wells 2 and 4, but is used only when the wells are discharged directly to the reservoir. When water is discharged from the wells directly to the reservoir, the chlorination rates at Wells 2 and 4 is adjusted to provide the target chlorine residual in the combined flow from Wells 2, 4 and 5.

When the wells are discharged to the slow sand filter, the water is chlorinated as it leaves the filter system.

The Naches Street Well (Well 1) has its own gas chlorination system, and water from this well is pumped directly into the distribution system. No chlorine contact time is required for this well.

Water from Trail Wells 1 and 2 is treated with pyrolusite filter media to remove dissolved iron and manganese. The Trail Wells Treatment Facility includes five, 3-foot diameter vessels and has a design flowrate of 300 gpm and a design filter loading rate of 8.5 gpm/sq. ft. The raw well water is chlorinated with glass chlorine and sodium permanganate upstream of the filters. The treated water enters the distribution system
near the intersection of Ryan Road and SR 165.

### Forecast of Future Needs

Future treatment needs include the following improvements at the WTP:

- Increasing filter-loading rate and expand slow sand treatment plant to gain more filtration capacity. Projects under the Source and Supply section will address the slow sand filtration capacity.

The following project descriptions are provided as a brief outline to water treatment plant improvements, which will be required to support the anticipated future development and maintain adequate water service to existing development within the urban growth area boundary.

TR-1. Upgrade System Telemetry. This will allow the City to maintain more competitive service contracts for maintenance and repairs of its telemetry equipment.

## STORAGE

### Level of Service

Storage capacities shall be per the Washington State Department of Health's sizing guidelines and requirements as stated within the Ten State Standards.

### Inventory of System

The system includes two storage reservoirs. Only one reservoir, located adjacent to the filtration plant is normally used. This reservoir has a capacity of 2.3 million gallons.

### Proposed Locations and Future Needs

Based on projected growth rates and required storage volumes, the City will exceed its storage capacity by the year 2029. The City will require an additional 208,000 gallons of storage by the year 2029. This assumes the City increases its source capacity to meet its maximum day demands (from the current 1,870 to a future 2,425 gpm in 2035). Future storage needs include:

- Additional storage will be required by 2029. Approximate reservoir size is anticipated to be 1.0 million gallons to provide redundancy for the existing 2.3 million gallon reservoir.

The following project descriptions are provided as a brief outline to storage improvements, which will be required to support the anticipated future development and maintain adequate water service to existing development within the UGA boundary.

ST-1. Reservoir Siting Study. Evaluate potential reservoir locations and configurations.
ST-2. Construct 1.0 MG Reservoir.

## TRANSMISSION AND DISTRIBUTION SYSTEM

### Level of Service

This supply of water to various areas within the UGA boundary shall be completed to comply with the Department of Health, Ten State Standards, and County Fire Marshall Standards.

### Inventory of System

The existing City water system is shown in Figure W1. The system includes both transmission and distribution components. The transmission main conveying water from South Prairie Creek to the slow sand filtration plant is 29,200 feet in length. The City's distribution system consists of 32 miles of pipes ranging in size from 4 to 12 inches in diameter. The various pipe materials include ductile iron pipe, polyvinyl chloride pipe, cast iron pipe, steel pipe, and HDPE pipe. The age of the existing system varies but a sizable portion of the network was installed over 50 years ago.

### Proposed Locations and Future Needs

To determine the future impacts that increasing development may impose upon the City's existing system a hydraulic model analysis was performed. The City's water system was analyzed using MWH Soft's $H_2ONet$ hydraulic modeling software, which operates in an AutoCAD computer-aided design and drafting environment. The $H_2ONet$ model was created using the City's water system basemap. Reservoir elevations and well capacities were determined from existing planning documents and City records. The $H_2ONet$ model is configured with a graphical user interface. Each water system element (sources, pipes, control valves, and reservoir) is assigned a unique graphical representation within the model. Each element is assigned a number of attributes specific to its function in the actual water system. Typical element attributes include spatial coordinates, elevation, water demand, pipe lengths and diameters, and critical water levels for reservoirs. With attributes of each system element as the model input, the software produces the model output in the form of flows and pressures throughout the simulated water system. The following five system demand scenarios were used to hydraulically model the City of Buckley water system:

- 2014 Average Daily Demands: These demands were used while calibrating the model.
- 2020 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi.
- 2020 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's requirement of 20 psi.
- 2035 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi.
- 2035 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's requirement of 20 psi.

The following project descriptions are provided as a brief outline to improvements, which will be required to support the anticipated future development and maintain adequate water service to existing development within the urban growth area boundary (see Figures W2 and W3). The improvements, which have been noted represent additions to the existing main line conveyance systems and are presented to allow for the delivery of water, to the estimated development areas, for both potable and fire flow usage. Additional improvements will undoubtedly be required within various communities as the location of growth and the type of developments would dictate. The following projects are listed in order of priority under either, Transmission or Distribution.

*Transmission*

T-1. Segment 6, End of Trenchless to North Slope-replace 2,440 LF of Raw Water Transmission Main between Segment 5 and Segment 7 with new 12-inch HDPE Raw Water Transmission Main.
T-2. Segment 8, Creek Crossing Restoration. The City installed a cable bridge across South Prairie Creek in 2016 to carry a segment of the transmission main. The old pipeline and concrete encasement requires removal and the disturbed banks along the creek require additional restoration.
T-3. Segment 13, Between Replacement Segments-replace 260 LF of Raw Water Transmission Main between Segment 14 and Segment 16 with new 12-inch HDPE Raw Water Transmission Main.
T-4. Segment 15, End of Cable Bridge to Replacement Segment-replace 1,135 LF of the Raw Water Transmission Main from the north end of the cable bridge to connect the south end of the Segment 14 with new 12-inch HDPE Raw Water Transmission Main.
T-5. Annual Transmission Main Leak Detection-continue an annual leak detection program to determine if there are any additional sections of the pipeline in need repair.
T-6. Segment 16, Existing Cable Bridge. Replace 200 LF cable bridge across a creek gully.
T-7. Segment 19, Along Cliff Face. Replace 200 LF of transmission main, including a new cliff anchorage system.
T-8. Segment 21, Creek Bed to Headworks. Replace 1,000 LF of transmission main in the South Prairie Creek streambed near the headworks of the transmission main.

*Distribution*

D-1. Edith from Park to Dundass, Balm from 4th to Ewing, Ewing from Dundass to Balm, 3rd from Main to Masin. Install 1,200 LF of 8-inch water main.
D-2. Heather between Whitmore and Elk Ridge Elementary School. Install 70 LF of 8-inch water main.
D-3. Mason from A to D, B south of Mason, Rainier from Main to Mason. Install 1,900 LF of 8-inch water main.
D-4. A from Park to Main. Install 850 LF of 8-inch water main.
D-5. Division from Ryan to Fire Station. Install 360 LF of 8-inch water main.
D-6. Jefferson from 3rd to Pearl, Pearl from Perkings to Ryan, Mill from Pearl to Jefferson. Install 2,080 LF of 8-inch water main.
D-7. Ryan from Spiketon Road to east side of LDS Church. -Install 2,360 LF of 12-inch water main.
D-8. Fulton and 4th. Install 450 feet of 8-inch water main.
D-9. Sheets, south of Ryan. Install 600 feet of 8-inch water main.
D-10. Klink, south of Ryan. Install 1,400 feet of 8-inch water main.
D-11. SR 410, west to Mundy-Loss. Install 1,100 feet of 8-inch water main.

D-12 Hinkleman Extension from SR 410 to 112th. Install 700 feet of 8-inch water main.
D-13 Hinkleman Road from Hinkleman Extension to Mundy-Loss. Install 2,200 feet of 8-inch water main.
D-14. McNeely, north of Collins. Install 2,200 feet of 8-inch water main.
D-15. McNeely, south of Collins. Install 750 feet of 8-inch water main.
D-16 River, north of Dieringer. Install 450 feet of 8-inch water main.
D-17 Mason from Spruce to McNeely. Install 2,000 feet of 8-inch water main.
D-18 Dieringer from Sorenson to McNeely. Install 2,200 feet of 8-inch water main.

# IV. SEWAGE COLLECTION AND TREATMENT

The City of Buckley owns, operates, and maintains a sanitary collection system within City limits. The City system consists of a collection system, a secondary wastewater treatment plant, and an outfall to the White River. The plant is located north of Park Avenue and currently serves an estimated 4,300 people. Additionally, the City receives wastewater from a school district lift station west of the City, which serves two existing schools of the White River School District. The plant operates under NPDES WA-002336-1, which became effective May 1, 2003 and 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. Under this permit, treated effluent is discharged into an outfall located in a side channel of the mainstream of the White River. The nearest other treatment facility is located at the Enumclaw WWTP located about 2 miles to the northeast of Buckley.

This section of the report first addresses the conditions and needs of the sanitary collection system and then those for the wastewater treatment facility.

## COLLECTION SYSTEM

### Level of Service

The Level of Service (LOS) for the sanitary sewer system was established from the *Criteria for Sewage Works Design*, Department of Ecology, 2008, and construction standards adopted by the City through its municipal codes.

The Level of Service (LOS) requirements for the sanitary sewer collection system include the capability of handling peak flow and providing adequate pipeline velocity. Gravity lines must be sized and sloped to provide a minimum velocity of 2 feet per second. Minimum pipeline diameter for gravity service is 8 inches with a slope of 0.004 ft/ft. In addition, gravity lines must be protected with a minimum of 3 feet of cover and provided with manholes spaced about 400 feet apart and located at all the intersections and changes of grade. New construction is required to meet standards to limit infiltration and inflow into the system. These standards include precast manhole sections with gasketed seals, concrete pipe with rubber joints, or heavy duty PVC pipe.

The City of Buckley system currently has only two pump stations on the west end of the system, which serve two schools. However, it is anticipated that as the City expands to provide service within its GMA boundaries, additional pumping stations will connect to the system. Design criteria for pumping stations are established in detail in the *Criteria for Sewage Works Design.* Among the requirements are ones for duplicate pumps for each station, each capable of handling the station's maximum design flow. Each station shall be protected against the 100-year flood and provide sufficient head to maintain a minimum velocity of 2 feet per second within the force main. Minimum pipe size for sewage force mains shall be 4 inches. In addition, an alarm system shall be provided for all pumping stations as well as provisions for auxiliary power.

**Inventory of System**

The City's existing sanitary sewer system consists of approximately 123,500 LF of gravity sewers, 10,600 LF of 6-inch and 4-inch force mains, and approximately 270 manholes. The existing sanitary sewer system is shown in Figure S1. The system is more or less divided into two parts by SR 410. Flow on the southeast side of SR 410 is collected, transported under the highway at Wheeler Avenue and Park Avenue, and then conveyed by gravity to the wastewater treatment plant (WWTP) north of Park Avenue. A small volume of flows is conveyed across SR 410 immediately west of the intersection of SR 410 and SR 165. Flows northeast of the highway travel north to the main trunk line on Park Avenue. A summary of this collection system is shown below in Table U1.

**TABLE U1 Collection System Inventory**

| Pipe Diameter | Length (lineal feet) |
|---|---|
| **Gravity System** | |
| 4-inch | 24,000 |
| 6-inch | 2,100 |
| 8-inch | 60,300 |
| 10-inch | 12,000 |
| 12-inch | 9,100 |
| 14-inch | 2,000 |
| 15-inch | 2,100 |
| 18-inch | 6,200 |
| Subtotal | 117,800 |
| **Force Main** | |
| 4- and 6-inch | 7,800 |

The collection system in Buckley was originally built in the early 1900's as a combined storm and sanitary sewer system. Over the years, extensions and sewer separations have occurred resulting in a total pipeline length exceeding 125,000 feet. The older gravity sewer mains consist of clay pipe with mortared bell-spigot type joints. More recent construction is primarily 8 and 10-inch concrete and PVC pipe with rubber joints. However, only about 1/3 of the system was installed with this type of construction. The depth of the sewer mains typically varies from 2 to 15 feet, with 6 to 7 feet as the average depth. Manholes in the

older portion of the system are of brick and mortar construction, while the most recently installed manholes are precast concrete. Due to the age of the system, the depths of the conveyance mains and type of construction, infiltration and inflow (I/I) problems have continued to develop. I/I problems result during storms, when water infiltrates through pipe imperfections such as misaligned joints and cracks in the lines, greatly increasing flows to the plant. The City has replaced most of the downtown core area gravity sewers, resulting in significant reductions in I/I.

**Proposed Location and Future Needs**

The evaluation of the City's collection system conducted in 2017 identified several needs to serve existing and future customers. These are briefly discussed below. In addition, planning under GMA has identified other future needs.

As has been previously noted, the majority of the City's original sanitary sewer conveyance system consisted of 50 year old clay pipe which had deteriorated considerably and was in need of replacement due to the volumes of infiltration/inflow presently accessing the conveyance network. Furthermore, by the Department of Ecology (DOE) standards several of the existing sewer mains are undersized and/or sloped at less than acceptable grades.

A sewer system rehabilitation program was first developed from an I/I study in 1973. A second I/I analysis and a sewer system evaluation survey were conducted in 1975. Because the WWTP exceeded design flows during wet weather months, a third I/I study was undertaken in 1992 and completed in 1994. This report (Infiltration/Inflow Analysis and Engineering Report) was amended in January 1999. The report indicated that removal of I/I would be more cost-effective than expansion of the treatment plant, if 45 percent of the I/I were removed. Manhole rehabilitation was also identified in the 1994 plan as another project aimed at reducing I/I. The amendment to the I/I analysis and Engineering Report completed in January 1999 looked at reducing I/I in two of the drainage basins.

As a result of the 1992-94 I/I study, the city of Buckley replaced parts of its sanitary sewer collection system. In 1998, the City applied for approval from the Department of Ecology to increase the capacity of the WWTP by approximately 330 connections, and received approval on condition that the City construct wastewater improvements to remove approximately 45 percent of the inflow and infiltration of stormwater into the City's sewer system and on the condition that the City construct a digester at the treatment plant.

The future improvement projects recommended by this plan are based both on the anticipated maximum or build-out development within the UGA boundary and the existing condition of the sanitary conveyance system as described in the modeling completed in 2015.

The expected future sewage flow rates were developed by applying per capita flow rates and peaking factors to the estimated population figures as have been presented within the land use element section of this plan.

The 2017 Draft Sewer Comprehensive Plan included a hydraulic capacity analysis of the existing sewer collection system using a computer software modeling program called InfoSewer. The entire city was divided into eight sewer basin areas, shown in Figure S2. Interceptors within the eight areas were at least 10 inches in diameter or greater. The eight areas include the existing service areas named as follows: A1, A2, A4, CW, A26, B13, E2A, and F1. The future service areas are named as follows: Nanevicz, North McNeely, Central McNeely, South McNeely, Van Sickle, Shay/Rainier School, TAN-W, TAN-E, Elk Heights, EM, and SE. Currently, approximately 1,100 acres are being served by the City's collection system. The future service area will include an additional 800 acres for a total of approximately 1,900 acres in the City's collection system. The amount of sanitary flow is determined by the contribution per capita and the calculated population. The population density assumes the land is fully developed to the level allowed by the corresponding land use designation. The future peak flow of 2.88 mgd was used in the modeling.

All recommended pipe replacement projects include lowering the pipeline elevation and increasing the pipe's existing slope. These modifications will allow the system to serve outlying areas primarily by gravity.

The following projects address deficiencies to the sewer collection system identified from modeling and studies discussed above and are shown in Figure S3.

*Gravity Sewer Main Projects*

G-1. Alley to the East of Edith Street–construct 450 LF of new 8" PVC from Park Avenue to Dundass Street.
G-2. Spiketon Road-construct 500 LF of new 8" PVC from Ryan Road to A Street.
G-3. Alley between Cascade Street and Edith Street-construct 450 LF of new 8" PVC from Dundass Avenue to Park Avenue.
G-4. Near 550 Balm Street- construct 200 LF of new 8" PVC.
G-5. Spiketon Road–construct 900 LF of new 8" PVC from Ryan Road to 649 Spiketon Road.
G-6. Alley between Naches Street and Second Street–construct 1,000 LF of new 8" PVC, from Park Avenue to Mason Avenue.

*Trunk Sewer Main Projects*

T-1. McNeely Street South, East on Mason to State School Property Line, South to Ryan Road to Klink Street-construct 4,800 LF of new 12" PVC.

**AREA LIFT STATIONS**

There is presently sewer service to the elementary and middle schools which are located in the most southerly and westerly area of the GMA boundary via a 6-inch force main along SR 410 and a school district maintained lift station. The existing topography of this area would dictate that gravity mains flow towards the most northerly and westerly area of the proposed development limits. To convey flows completely by gravity from the most outlying areas to

the treatment plant would require sewer piping installation of depths, over 25 feet. This type of system is not viewed as financially feasible because of these depths and the glacial till underlying most of the area. An alternative is the installation of lift stations sized to serve the developing population.

The following projects address deficiencies to the sewer collection system that are remedied by lift stations and force main projects:

*Lift Station and Force Main Projects*

L-1. South Spiketon Road Lift Station - 500 gpm, 2 pumps with Emergency Generator.
F-1. South Spiketon Road-construct 1,300 LF of new 6" Ductile Iron Force Main.

**COMPLETION OF SANITARY SEWER SYSTEM REHABILITATION**

The system improvements and/or extensions noted above do not include additional projects that need to be completed for the continued improvement of the older segments of the collection system. The City will complete TV inspection work and disconnection of roof, yard, and cellar drains as previously recommended to City. The City will also analyze and collect additional flow data, conduct limited system evaluation and complete spot repairs, perform mainline and side sewer rehabilitation of existing sewers as identified in I/I Program and system evaluation.

**TREATMENT SYSTEM**

**Level of Service**

The Level of Service (LOS) for the sewage treatment plant was established from the *Criteria for Sewage Works Design,* DOE, 2008. Average design flows were established from an average demand of 108 gallons per day per capita, and the expected service population. Projected wastewater flows in 2035 are 1.07 mgd annual average flow and 1.60 mgd maximum monthly flow.

In addition to hydraulic design criteria, there are also loading criteria for LOS. Typically loading criteria are established for Biological Oxygen Demand ($BOD_5$) and Total Suspended Solids (TSS). For BOD, 0.2 lbs/day per capita was utilized for design loadings; for TSS, 0.17 lbs/day per capita were utilized. Both values are consistent with Criteria of Sewage Design. Historic phosphorus literature data was used to size the nutrient removal components to be added treatment plant.

The existing sewage treatment plant is permitted NPDES WA-00-2336-1 which was issued May 1, 2003 and 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. This permit establishes reporting requirements and performance criteria for the discharge of treated wastewater and the quality of wastewater

sludge. Phosphorus limits are not included in this permit, but are anticipated in the next permit cycle. The values shown below represent the limits on what the treatment plant can discharge to the White River under the existing permit.

**Table U-2** NPDES Permit Limits

| Parameter | Monthly Average | Weekly Average |
|---|---|---|
| 5-day Biochemical Oxygen Demand | 30 mg/L<br>134 lb/day | 45 mg/L<br>201 lb/day |
| Total Suspended Solids (TSS) | 30 mg/L<br>114 lb/day | 45 mg/L<br>171 lb/day |
| Fecal Coliform Bacteria | 200/100 ml | 100/100 ml |
| pH | Shall not be outside the range of 6.5-8.5 | |
| Total Residual Chlorine | 9 ug/L | 23 ug/L |
| Total Ammonia (as N)<br>May1 – Oct.31 | 2.6 mg/L | 7.43 mg/L<br>62 lbs./day |
| Total Ammonia (as N)<br>Nov. 1 – Apr. 30 | 4.5 mg/L | 10.5 mg/L |
| Total Copper | Interim 27 ug/L<br>Final 11.13 ug/L | Interim 38.5 ug/L<br>Final 16.24 ug/L |

A review of monthly reports for the period of 2009 to 2017 indicated that the plant did not fail to meet these discharge limits.

### Inventory of System

The current plant was designed to accommodate an average flow of 1.0 mgd and has a peak hydraulic capacity of 2.7 mgd.

The system components include headworks/grit removal, two oxidation ditches, two clarifiers, chlorination/dechlorination, and a mechanical building housing sludge pumps and dewatering equipment. The headworks of the facility consists of the influent channel, a bar screen, a degritter, a grinder, an adjustable flow splitter and effluent channels to the oxidation ditches. From the headworks, influent enters the oxidation ditches where the main treatment process occurs. Effluent is then transported to the clarifier units where solids are separated from liquid and either recirculated to the oxidation ditches or wasted to the sludge disposal system. Effluent from the clarifiers enters the dual chlorine contact tanks prior to discharge into the White River via a 14-inch outfall pipe.

### Treatment System Improvements

The City of Buckley completed major improvements to the exiting wastewater treatment, effluent disposal, and biosolids processing systems in 2008.

The needs for these improvements are being driven by two factors. The first is the implementation of phosphorous limitations for discharges to the White River. Buckley currently operates a conventional secondary wastewater treatment plant. The White River has been the location of the City's treated wastewater effluent discharge. A Total Maximum Daily Load (TMDL) study was performed on the White River and it was determined that phosphorous loadings were a threat to the health of the river. A subsequent Waste Load Allocation (WLA) has determined that Buckley must reduce its phosphorous loadings to the river. A conventional secondary treatment is not capable of removing phosphorous to the level required by the WLA, so the City proceeded with improvements necessary to remove phosphorous.

The second factor is the need to accommodate additional growth in the Buckley Urban Growth Area (UGA). The current customer base for the wastewater system consists of approximately 4,300 persons. This customer base is expected to increase to 8,000 by the year 2035.

With the substantial treatment plant upgrades completed, the City plans to make a minor revision to one of the plant systems and to evaluate improvements needed for reuse water to be distribute

*Wastewater Treatment Plant Projects*

TP-1. WWTP Non-Potable Water System Upgrades
TP-2. WWTP Wastewater Reuse Feasibility Study

# V. STORMWATER COLLECTION AND TREATMENT

The storm and surface water drainage utility is owned, operated and maintained by the City and provides drainage, flood control, and protection of environmentally sensitive areas such as wetlands, steep slopes and stream corridors. For the most part, the original system is somewhat antiquated and consists of piping materials and construction methods, which were employed nearly 60 years ago. The majority of this original drainage network was completed using clay tile piping with open joint construction. Over time, this piping has deteriorated to an extremely poor condition, with several areas needing immediate improvements.

The City utilities department has completed some improvements to the system over the years. The installation of new piping systems and improvements to existing drainage channels has substantially increased the hydraulic performance of the existing system. Current growth and expected growth will require more improvements and additions to the existing system. The existing storm drainage system is shown in Figure D1.

The Level of Service (LOS) for the City's stormwater conveyance system is to convey the 25-year storm event. The City of Buckley has adopted the *Ecology Stormwater Management Manual for Western Washington (2012)*, as the City's technical manual (BMC 14.30.061).

The City has also adopted the *Low Impact Development Technical Guidance Manual for Puget Sound (LID Manual)*.

Moving stormwater within the City is difficult, due to the flat topography and minimal natural grade within the City to convey surface water runoff. The area, prior to development, was dominated by wetlands and lies within the flood plain of the White River. Several areas are serviced by open ditches, which convey water into the pipe collection system or into an open, uninhabited area.

## TREATMENT

As stated previously, the City has adopted *Ecology's 2012 Stormwater Management Manual*, which describes in detail the methods and practices for mitigating stormwater runoff impacts.

### Level of Service

The Washington State Department of Ecology (DOE) has enacted certain guidelines and rules for the management of stormwater. The requirements include provisions for the following: ordinances to control off-site water quality, the use of source Best Management Practices (BMPs), effective water quality treatment for the design storm, use of infiltration where possible, erosion and sediment control, the protection of wetlands and stream channels; operation and maintenance programs for new and existing stormwater systems; record keeping of drainage system facilities; adoption of Ecology's Technical Manual or equivalent; education programs for the general public; coordination with the Growth Management Act; and basin planning.

The City adopted stormwater management regulations are included in Buckley Municipal Code Chapter 14.30. The activities covered under this regulation include land disturbing activities, structural development including construction, installation or expansion of a building or other structure, creation of impervious surfaces, Class IV general forest practices that are conversions from timber land to other uses, subdivision, short subdivision and binding site plans and redevelopment.

The level of service chosen for new conveyance facilities is to provide the conveyance capacity of the 100-year, 24-hour event.

## COLLECTION

### Level of Service

The Pierce County ordinance requires the City to develop a Storm Drainage Plan that describes how all storm drainage impacts will be mitigated for any existing or future project. This plan is required if the project consists of or results in high housing densities, changes in the drainage patterns, contains wetlands or swales, filling, sensitive areas, is tributary to any pothole off-site, changes to the runoff coefficient, changes in erosion characteristics, or if 25 percent of the surface area becomes impervious.

This plan must include a description of the property prior to development, as it exists now, and how it might be modified in the future; details of the topography, basin, and soils; downstream drainage analysis, and calculations of the runoff rates and volumes that would occur for the 25-year event. In addition, the plan must include recommendations and construction projects necessary to manage any runoff problems.

The importance of a storm drainage plan, and of properly managing storm runoff, is significant step in alleviating potential future drainage issues. By detaining, retaining, or allowing storm runoff to infiltrate, citizens, property and environmentally sensitive areas are better protected from flooding, erosion, depleted groundwater and summer base flows, and pollution.

**System Inventory**

The City's storm drainage network is comprised of numerous catch basins and storm drain manholes, piping ranging in size from 6 to 36 inches, year and/or area draws, detention ponds/pipes and an extensive network of storm drainage ditches that includes culverts and outlet channels. Several areas are either not currently serviced or are inadequately serviced. Areas slated for development or currently without service will require improvements before any development can continue, in order to mitigate flooding and other impacts.

The City does not currently provide storm drainage for the State of Washington Rainier School. The Rainier School is located along the easterly City limit and encompasses nearly 160 acres. The School directs a majority of its stormwater through a privately maintained system to an outfall in the White River, north of the City. It is believed that the south campus, approximately 70 acres in area, channels storm runoff into the City's drainage system located along and within the Ryan Road corridor.

The collector and drainage infrastructure, as it presently exists, predominantly conveys water to both the north and west areas of the City to ultimately discharge into the Puget Power Flume and the White River Basin. Areas to the south and east part of the City, which are less developed, discharge drainage flows south into the Spiketon Creek Basin area. The City's existing storm drainage system in included as Figure D1.

To analyze the existing and required future storm drainage capacities, the Urban Growth Area was segregated into fourteen individual drainage basins. Some of the basins were divided into smaller sub-basins for the purpose of analysis. This was accomplished based on the present system's configuration and outfall locations as well as the general topography of the Buckley Basin. These individual drainage basins are shown in Figure D2. Existing conveyance piping and stormwater outfall locations were surveyed to estimate the maximum available capacity at discharge points. Previously, City standards relied on the "Yrjanainen and Warren" (Y&W) method of hydraulic analysis. The Ecology Manual uses the "Unit Hydrograph Analysis Methods" for estimating storm run off volumes and rates as the preferred method for estimating runoff. The Comprehensive Flood Hazard Management Plan for Buckley used the Santa Barbara Urban Hydrograph Method to analyze 10, 25, 100,

and 500- year storm events. The analysis reflected existing conditions as well as impervious areas that are likely to result from the Comprehensive Plan – designated development. The existing drainage conditions, outfall capacities and estimated future drainage flows were then reviewed to determine storm sewer improvements necessary to decrease flood potential. There are several basins within the City with inadequate storm drainage. The City lies in a relatively flat area, which makes management of drainage challenging. In addition, previous storm drainage detention standards either did not include detention, or included a 25-year Y&W detention analysis. These standards proved to be inadequate during the 1996 and 1997 floods. Some of the areas needing improvements simply require larger pipes or open channels. For others, increasing conveyance will move existing flooding to another location. In addition to these conveyance system mitigation measures, alternatives including construction of detention facilities and restoration of historic drainage patterns must be considered.

The City currently experiences flooding and ponding in areas which are not provided with adequate storm drainage. Some of the areas needing improvement simply require larger pipes or open channels, while others have no conveyance system in place. Areas now being proposed for development will need upgrades to existing conveyance systems before any development can be completed. Areas of large impervious surfaces will result in flooding and erosion leading to property damage, unless an adequate drainage system is constructed.

The previously completed sanitary sewer infiltration/inflow report recommends that once improvements to the sanitary system have been completed and sewage flows are redirected into the new network, the old sanitary sewer pipe can be used to collect, convey and discharge storm runoff. The stormwater improvements outlined herein have been selected based on the use of the existing storm sewers capacity. Additional drainage capacity could be achieved by the conversion of sanitary piping, and may be completed during sanitary system improvement projects, not included as a part of this analysis.

The City's existing storm drain outfall locations were surveyed and reviewed to estimate existing basin discharge capacities. These estimates were then compared with both the existing drainage flows and future estimated maximum runoff flows to determine the current and future levels of service.

### Proposed Locations and Future Needs

The following project descriptions and recommendations for construction projects have been selected based on a review of the City's existing storm drainage conditions. These improvements are targeted to remove existing storm conveyance problems within the City. Each of the selected projects is to be completed with systems that will adequately pass the runoff from the future "build-out" developments that are presently anticipated. The recommended piping has been selected to comply with the City standards, which require commercial and high value areas to convey a 100-year storm event at maximum development expected to occur in each area.

Each of the indicated stormwater system improvement projects indicated in Figure D3, have been proposed based on both future development and existing conditions. Figure D3 indicates capital improvements recommended for the 6-year and 20-year time frames. The main trunk lines of each basin's system have been shown and outfall locations have been selected to take advantage of existing topographic conditions. Improvements to the existing sanitary sewer system or roadways may significantly impact the development of these projects.

The following is a brief description of the projects involved in developing a complete storm drainage system, which will support the drainage requirements of the area within the UGA boundary. The projects are taken from the May 2008 *City of Buckley Comprehensive Stormwater Management Plan (CSMP)* and are listed in order of priority.

*Stormwater Capital Improvement Projects*

CIP 1 – Spiketon Bridge involves the installation of a 12-foot-wide by 3-foot-tall bridge section at the Spiketon Road crossing. This will replace the two 24-inch concrete pipes at Spiketon Road and will help minimize flooding currently experienced in this area during a 100-year storm event.

CIP 2 – Dundass Avenue is a project that was brought to the attention of City staff by a resident in 2006. This project includes connecting 135 linear feet of new 12-inch pipe between 3rd Street and 4th Street to the existing storm system. The installation of this pipe should alleviate the flooding seen in this area.

CIP 3 – The Sheets Road Diversion project involves the diversion of flow from Spiketon Ditch to the ditch along the east side of Sheets Road. This ditch flows north, under Ryan Road, and then along the west side of the Rainier School property where it crosses Collins Road, and eventually discharges to the PSE Flume. In diverting water north along Sheets Road, flooding will be lessened on the properties surrounding Spiketon Ditch west of Sheets Road. This project involves the upgrade of existing Sheets Road driveway culverts to 36-inch pipes and the replacement of a 36-inch pipe south of Collins Road with 1,025 linear feet of 60-inch pipe. Flow splitters will also be needed to direct flow north along Sheets Road, and then again near Ryan Road where flow will need to be disbursed between the existing 18-inch and 24-inch pipes in this area.

CIP 4 – The Division Street (Ryan Road Diversion) project is a temporary measure to implement prior to the installation of a 48-inch pipe that will connect runoff from Ryan Road to the existing 48-inch pipes in Hinkelman Extension. The purpose of the Division Street project is to divert water from Ryan Road south along Division Street. By doing so, the first 645 linear feet of pipe will need to be replaced with 24-inch pipe. In addition, 100 linear feet of ditch will need to be rehabilitated near the south end of Division Street.

CIP 5 – The Hinkleman Road East Basin is a 58-acre basin that drains to the north via a ditch across private property midway between the Hinkleman Extension and Mundy Loss Road. The recommended improvements in this basin include the installation of 2,685 linear feet of 36-inch pipe on the south side of Hinkelman Road. The drainage should be directed east, opposite of its current flow direction, to the 48-inch storm sewer system installed in the Hinkleman Road Extension.

CIP 6 – The Hinkelman Extension/Ryan Road Extension project was noted above as the installation of 3,440 linear feet of 48-inch pipe. This pipe will connect the Ryan Road storm system to the existing 48-inch pipes at Hinkelman Extension. The pipes will extend west of the intersection of Ryan Road and Division Street, west toward 112th Street East. This project has been completed as part of the SR410/SR165 Realignment Project. The completed project has improved the flooding seen along Ryan Road and A Street and has helped restore the flow back to its natural discharge location.

CIP 7 – The McNeely basin includes the area between McNeely Road and the WSU Dairy Farm property, and is bounded on the south by Collins Road and the north by the PSE flume. The improvements in this basin are listed as the seventh priority of the CIP plan. The basin is lightly developed at this time. The ditch and driveway culverts that run north through this basin and along McNeely Road are not adequately sized to convey the 100-year event. The ditch should be rehabilitated for 354 linear feet, and 797 linear feet of pipe and culverts will need to be replaced with 24-inch pipes.

CIPs 8 and 9 – Regional Treatment and Detention Feasibility Studies to identify the feasibility of installation of one or more regional stormwater treatment and detention ponds should be prepared. These projects were ranked eighth and ninth. The City will need the results of the feasibility study in order to evaluate alternatives for system improvements. The use of regional stormwater treatment and detention ponds could eliminate the need for multiple treatment and detention facilities located on private property. Regional ponds, because of their size, may provide better opportunities for water quality treatment and more effective maintenance.

CIP 10 – The Elk Meadows Ditch project involves the enhancement of an existing ditch and culverts west of Sheets Road along private property. According to local residents, this area floods from Spiketon Ditch under extreme storm events. This project would involve the upgrade of three driveway culverts to two 3' x 3' box culverts and one 3' x 5' box culvert. In addition, 1,915 linear feet of ditch would need to be rehabilitated to handle the anticipated flow from a 100-year storm.

CIP 11 – The Spiketon Road project is a minor project that resulted from the hydraulic modeling done along Spiketon Road. Under the 100-year storm condition, a 242 linear foot section of ditch was found to have insufficient capacity. Therefore, it is recommended that a 2' x 3' box culvert replace this ditch.

CIP 12 – The Collins Road Basin includes the drainage systems along Collins Road, Sergeant Street, and Spruce Street. The basin has a large number of drainage deficiencies and the continuing development in this basin will continue to exacerbate the problem. The improvements recommended in the Collins Road Basin include pipe and ditch replacement. Approximately 2,150 linear feet of 18-inch pipe and 1,464 linear feet of 24-inch pipe would be installed along Collins Road. South of Collins Road, 1,314 linear feet of parallel 36-inch pipe would be installed, which would then connect to the Collins Road system which continues northerly. From Collins Road north, the existing pipe would be replaced with 3,290 linear feet of 60-inch pipe where it would then discharge into the PSE Flume.

CIP 13 – The Ryan Road project includes the extension of the new 48-inch pipe of the Hinkelman Extension/Ryan Extension project. A 36-inch pipe was placed in Ryan Road during 2006 that extended from the Division Street/Ryan Road intersection east toward Spiketon Road. According to the hydraulic model, this pipe will need to be supplemented with 1,659 linear feet of a parallel 36-inch pipe. In addition, this project includes the installation of 3,175 linear feet of 36-inch pipe and 1,018 linear feet of 48-inch pipe.

CIP 14 – The Downtown area consists of insufficient 18-inch pipes at the downstream end of the system in this basin. The Downtown project consists of replacing these 18-inch pipes with 140 linear feet of 24-inch pipes and 850 linear feet of 36-inch pipe.

CIP 15 – The North Highway 410 project incorporates the replacement of existing pipes with 1,240 linear feet of new 36-inch pipe and 210 linear feet of 48-inch pipe at the downstream end of this basin.

CIP 16 – The River Avenue North project is similar to the Downtown and North Highway 410 projects in that it includes the replacement of existing pipes with 1,720 linear feet of 36-inch pipe at the downstream end of the stormwater system in this area.

CIP 17 – The 112th Street Basin is bounded on the south by the high point in the topography south of 112th Street and Mundy Loss Road to the west. The drainage problems here have been minor in nature, yet the hydraulic model indicated that during a 100-year storm along the west end of 112th Street, the existing pipes and ditch need to be replaced with 1,541 linear feet of parallel 36-inch and 48-inch pipe.

CIPs 18 and 19 – West Highway 410A and 410B are located on the south and north sides of SR 410, respectively. The results of the hydrologic/hydraulic model indicated that the ditch should be replaced with 5,520 linear feet of 24-inch pipe on the south side of SR 410. It was also found that 75 linear feet of 12-inch pipe should be installed on the north side of SR 410 along with 85 linear feet of ditch that should be rehabilitated.

# VI. OTHER UTILITIES

## NATURAL GAS UTILITY

The natural gas distribution utility is owned, operated, and maintained by the Puget Sound Energy (PSE).

**Company Overview:** Puget Sound Energy (PSE) is a private utility providing natural gas and electric service to homes and businesses in Puget Sound region of Western Washington and portions of Eastern Washington, covering 10 counties and approximately 6,000 square miles. PSE's regional and local natural gas and electric planning efforts are integrated and centered on providing safe, dependable, and efficient energy service. PSE provides natural gas to more than 770,000 customers, throughout 6 counties, covering approximately 2,900 square-mile area. As of 2017, PSE provides natural gas service to approximately 1,500 customers in the City of Buckley.

**Regulatory Environment:** PSE's operations and rates are governed by the Washington Utilities and Transportation Commission (WUTC). PSE natural gas utility operations and standards are further regulated by the U.S. Department of Transportation (DOT), including the Pipeline and Hazardous Materials Administration (PHMSA). PHMSA's Pipeline Safety Enforcement Program is designed to monitor and enforce compliance with pipeline safety regulations. This includes confirmation that operators are meeting expectations for safe, reliable, and environmentally sound operation of PSE's pipeline infrastructure. PHMSA and the WUTC update pipeline standards and regulations on an ongoing basis to assure the utmost compliance with standards to ensure public safety. The residents within the City of Buckley rely on the coordinated effort between PSE and the City for the adoption and enforcement of ordinances and/or codes to support on the safe, reliable, and environmentally sound construction, operation and maintenance of PSE's natural gas facilities.

**Integrated Resource Plan:** In order for PSE to meet its regulatory requirements, it updates and files an Integrated Resource Plan (IRP) with the WUTC every two years. The IRP identifies methods to provide dependable and cost effective natural gas service that address the needs of retail natural gas customers. Natural gas sales resource need is driven by design peak day demand. The current design standard ensures that supply is planned to meet firm loads on a 13-degree design peak day, which corresponds to a 52 Heating Degree Day (HDD). Currently, PSE's supply/capacity is approximately 970 MDth/Day at peak. This figure will be updated in the fall of 2015. The IRP suggests the use of liquefied natural gas (LNG) for peak day supply and support the needs of emerging local maritime traffic and truck transport transportation markets.

**Natural Gas Supply:** PSE controls its gas-supply costs by acquiring gas, under contract, from a variety of gas producers and suppliers across the western United States and Canada. PSE purchases 100 percent of its natural-gas supplies needed to serve its customers. About half the natural gas is obtained from producers and marketers in British Columbia and Alberta, and the rest comes from Rocky Mountain States. All the gas PSE acquires is transported into PSE's service area through large interstate pipelines owned and operated by

Williams Northwest Pipeline. PSE buys and stores significant amounts of natural gas during the summer months, when wholesale gas prices and customer demand are low, and stores it in large underground facilities and withdraws it in winter when customer usage is highest; ensuring a reliable supply of gas is available.

**System Overview:** To provide the City of Buckley and adjacent communities with natural gas, PSE builds, operates, and maintains an extensive system consisting of transmission and distribution natural gas mains, odorizing stations, pressure regulation stations, heaters, corrosion protection systems, above ground appurtenances, and metering systems. When PSE takes possession of the gas from its supplier, it is distributed to customers through more than 21,000 miles of PSE-owned natural gas mains and service lines.

PSE receives natural gas transported by Williams Northwest Pipeline's 36" and 30" high pressure transmission mains at pressures ranging from 500 PSIG to 960 PSIG. The custody change and measurement of the natural gas occurs at locations known as Gate Stations. PSE currently has 39 such locations throughout its service territory. This is also typically where the gas is injected with the odorant mercaptan. Since natural gas is naturally odorless, this odorant is used so that leaks can be detected. The Gate Station is not only a place of custody transfer and measurement but is also a common location of pressure reduction through the use of "pressure regulators". Due to state requirements, the pressure is most commonly reduced to levels at or below 250 PSIG. This reduced pressure gas continues throughout PSE's high pressure supply system in steel mains ranging in diameter of 2" to 20" until it reaches various other pressure reducing locations. PSE currently has 755 pressure regulating stations throughout its service territory. These locations consist of Limiting Stations, Heaters, District Regulators, and/or high pressure Meter Set Assemblies.

The most common of these is the intermediate pressure District Regulator. It is at these locations that pressures are reduced to the most common levels ranging from 25 PSIG to 60 PSIG. This reduced pressure gas continues throughout PSE's intermediate pressure distribution system in mains of various materials consisting of polyethylene and wrapped steel that range in diameters from 1-1/4" to 8" (and in a few cases, larger pipe). The gas flows through the intermediate pressure system until it reaches either a low pressure District Regulator or a customer's Meter Set Assembly.
To safeguard against excessive pressures throughout the supply and distribution systems due to regulator failure, over-pressure protection is installed. This over-pressure protection will release gas to the atmosphere, enact secondary regulation, or completely shut off the supply of gas. To safeguard steel main against corrosion, PSE builds, operates, and maintains corrosion control mitigation systems to prevent damaged pipe as a result of corrosion.

**Future Projects:** To meet the regional and City of Buckley natural gas demand, PSE's delivery system is modified every year to address new or existing customer growth, load changes that require system reinforcement, rights-of-way improvements, and pipeline integrity issues. The system responds differently year to year and PSE is constantly adding or modifying infrastructure to meet gas volume and pressures demands. At this time, there are no known major construction projects anticipated in the City of Buckley.

Current and future system integrity work will include ongoing investigations throughout the city to determine the location of where gas lines have been cross bored through sewer lines and make subsequent repairs.

## ELECTRICAL UTILITIES

Puget Sound Energy (PSE) serves the City of Buckley.

**Company Overview:** Puget Sound Energy (PSE) is a private utility providing electric and natural gas service to homes and businesses in Puget Sound region and portions of Eastern Washington, covering 10 counties and approximately 6,000 square miles. PSE's regional and local electric and natural gas planning efforts are integrated and centered on providing safe, dependable, and efficient energy service. PSE provides electrical power to more than 1.2 million electric customers throughout 8 counties. As of 2017, PSE provides electric service to approximately 2,000 customers in the City of Buckley.

**Regulatory Environment**: PSE's operations and rates are governed by the Washington Utilities and Transportation Commission (WUTC). PSE electric utility operations and standards are further governed by the Federal Energy Regulatory Commission (FERC), the National Electric Reliability Corporation (NERC), and the Western Electricity Coordinating Council (WECC). These respective agencies monitor, assess and enforce compliance and reliability standards for PSE. The residents of the City of Buckley and the region rely on the coordinated effort between PSE and the City for the adoption and enforcement of ordinances and/or codes to protect transmission and distribution line capacity and support federal and state compliance of safe, reliable, and environmentally sound operation of PSE's electric facilities. Routine utility maintenance work, including vegetation management is required to maintain compliance with FERC, NERC, and WECC regulations.

**Integrated Resource Plan:** In order for PSE to meet regulatory requirements, it updates and files an Integrated Resource Plan (IRP) with the WUTC every two years. The IRP) presents a long-term forecast of the lowest reasonable cost combination of resources necessary to meet the needs of PSE's customers to provide dependable and cost effective service over the next 20 years. The current plan, which was filed in May of 2013, details both the energy supply and transmission resources needed to reliably meet customers' wintertime, peak-hour electric demand over the next 20 years. The plan, which will be updated, forecasted that PSE would have to acquire approximately 4,900 megawatts of new power-supply capacity by 2033. This resource need is driven mainly by expiring purchased-power contracts and expected population and economic growth in the Puget Sound region. The IRP suggests that roughly more than half of the utility's long-term electric resource need can be met by energy efficiency and the renewal of transmission contracts. This reduces the need down to 2,200 MW by 2033. The rest of PSE's gap in long-term power resources, the IRP stated is likely to be met most economically with added natural gas-fired resources.

PSE generates approximately 46 percent of the electricity for its customers' from its own generation specifically generation plants; hydro, thermal, solar and wind. PSE currently has about 3,000 megawatts of power-generating capacity, and purchase the rest of its power

supply from a variety of other utilities, independent power producers and energy marketers across the western United States and Canada.

**System Overview:** To provide the City of Buckley with electricity, PSE builds, operates, and maintains an extensive integrated electric system consisting of generating plants, transmission lines, substations, switching stations, sub-systems, overhead and underground distribution systems, attachments, appurtenances, and metering systems.

Electricity provided by PSE to the City of Buckley is often produced elsewhere and is interconnected to the Northwest's regional transmission grid through an extensive network of transmission facilities providing bulk transmission service to meet the demands of electricity customers within the region's eight states. The PSE electric transmission facilities in the City of Buckley are important components of the electric energy delivery grid serving the Puget Sound region. As electricity reaches the City of Buckley the voltage is reduced and redistributed through lower-voltage transmission lines, distribution substations, overhead and underground distribution lines, smaller transformers, and to individual meters.

PSE will be prudently and systematically deploying smart grid technology at each level of infrastructure to enhance and automate monitoring, analysis, control and communications capabilities along its entire grid. Smart grid technologies can impact the electricity delivery chain from a power generating facility all the way to the end-use application of electrical energy inside a residence or place of business. The ultimate goals of smart grid are to enable PSE to offer more reliable and efficient energy service, and to provide customers with more control over their energy usage.

**Future Projects:** To meet regional and City of Buckley electric demand, PSE is upgrading the existing 55 kilovolt (kV) substations and transmission lines between Electron Heights (vicinity of Kapowsin) and Enumclaw to 115 kV. The multi-year projects began in 2009 and entail converting the voltage of over 20 miles of transmission line between the Electron Heights and Krain Corner (Enumclaw) substations, installing roughly 1.5 miles of new transmission line in Enumclaw, as well as converting, upgrading or completely rebuilding four substations as well as constructing a new substation in Buckley and adding a fiber-optic line to existing transmission facilities between Buckley and Enumclaw.

### TELECOMMUNICATION UTILITIES

The City of Buckley is served by CenturyLink. Various facilities are located throughout the County and the City.

Many of the telecommunication facilities are co-located with those of Puget Power. Buckley has digital electronic facilities available through CenturyLink, which allow call forwarding and a number of other features to be available to the customer.

CenturyLink reacts to customer demands, since the telecommunications industry is required to provide service upon demand. CenturyLink has indicated to the City that there is capacity for the City and its Urban Growth Area.

Cellular telephone service is provided in the Buckley area by Comcast. Cable TV is provided to the Buckley area by Comcast for areas surrounding the City.

The provision of telecommunication services is driven by the needs of its customers. As the city grows, telecommunication facilities will be upgraded to ensure adequate service levels. Facilities will be upgraded as technology advances.

### SOLID WASTE COLLECTION

The City contracts with D.M. Disposal Company for solid waste collection. Collection is performed once a week. in the unincorporated portion of the Planning Area, solid waste is collected also by D.M. Disposal.

# VII. GOALS, OBJECTIVES, AND POLICIES AND CONSISTENCY WITH COUNTY-WIDE POLICIES

### PLAN FOR FUTURE UTILITIES

This section discusses the plan for future utilities in the City of Buckley. The timing of development and provision of utility services are key components of this planning process. In addition to the discussion below, growth alternatives in the Land Use Element, have been developed to illustrate the various land uses and growth management strategies.

The analysis of existing conditions and projected needs in the previous sections highlights the areas of concern and opportunities for the City of Buckley. The vision statement for the City was used, along with the inventory and analysis contained in this element, to create a plan. The plan contains a strategy for achievement of the City's goals. The goals and policies within the plan provide guidelines and steps to attain those goals.

#### Vision Statement and Comprehensive Plan Goals

These goals are essential to the quality of life in the City of Buckley and likely will remain unchanged for long-term planning.

#### Utility Goals

Utility Goal 1: Facilitate the development and maintenance of all utilities at the appropriate levels of service to accommodate growth that is anticipated to occur in the City of Buckley and its Urban Growth Area.

Utility Goal 2: Facilitate the provision of utilities that are environmentally sensitive, safe and reliable, aesthetically compatible with the surrounding land uses, available at a reasonable economic cost, and can be provided in an efficient manner.

Utility Goal 3: Process permits and approvals for utility facilities in a fair and timely manner and in accord with the development regulations which encourage predictability and consistency.

**General Utility Policies**

The policies specify what shall be accomplished to reach the goals. These policies either provide clear guidance for decision-making when a situation arises, or provide clear responsibilities that will be implemented. The accomplishments under these policies can be used to measure progress toward the goals.

*Policy U-1*

Public facilities and utility services necessary to support development shall be adequate to serve the development at the time development is available for occupancy and utility use shall not create a decrease in current service levels below City of Buckley standards.

*Policy U-2*

The location, type, and size of all public facilities shall be determined and/or approved by the City. The extension and sizing of system components shall be based on the land use plan and proposed development.

*Policy U-3*

Facilities shall be designed, constructed, and maintained to reasonably minimize their impact on surrounding neighborhoods.

*Policy U-4*

Facilitate public utility service to unserved areas of the Urban Growth Area, including extensions into potential annexation areas under conditions consistent with the Growth Management Act.

*Policy U-5*

Coordinate with other jurisdictions and governmental entities in the planning and implementation of multi-jurisdictional utility facility additions and improvements.

*Policy U-6*

Coordinate with Pierce County to ensure that public utility facilities that are to be constructed in potential annexation areas are designed and built in accordance with the City's standards.

*Policy U-7*

Require notification to the City prior to a utility's maintenance or removal of vegetation in City right-of-ways.

*Policy U-8*

Require the reasonable screening and/or architecturally compatible integration of all new site-specific, above-ground facilities.

*Policy U-9*

The City and utility company shall coordinate the acquisition, use, and enhancement of utility corridors for pedestrian, bicycle, and equestrian trails and for wildlife corridors and habitat provided such joint use is consistent with limitations as may be prescribed by prudent utility practice.

*Policy U-10*

Facilitate the conversion to cost-effective and environmentally sensitive alternative technologies and energy sources.

*Policy U-11*

Facilitate and encourage conservation of resources.

*Policy U-12*

Encourage system design practices intended to minimize the number and duration of interruptions to customer service.

*Policy U-13*

Encourage the utilities to solicit community input on the siting of proposed facilities prior to seeking City approval for facilities, which may have a significant impact on the community.

*Policy U-14*

The City shall promote, when reasonably feasible and appropriate, co-location of new public and private utility distribution facilities in shared trenches/rights of way, and coordination of construction timing to minimize construction-related disruptions and reduce the cost of utility delivery.

*Policy U-15*

The City will provide timely effective notice to utilities to encourage coordination of public and private utility trenching activities for new construction and maintenance and repair of existing roads.

*Policy U-16*

The City shall encourage provision of an efficient, cost-effective, and reliable utility service by ensuring land will be made available for the location of utility lines, including location within transportation corridors.

*Policy U-17*

The City will encourage utility providers to ensure that all maintenance, repair, installation, and replacement activities by utilities are consistent with the City's Critical Areas Ordinances (CAOs).

*Policy U-18*

The City will utilize maps of the existing and proposed utility facility corridors to determine consistency of such designations with the elements of the comprehensive plan.

*Policy U-19*

The City will assure that the comprehensive plan designates areas available for the location of utility facilities.

*Policy U-20*

Encourage additions to and improvements of facilities that provide adequate capacity for future planned growth.

**Water Utility Policies**

*Policy W-1*

Provide reliable water service for domestic use, fire flow, and emergencies.

*Policy W-2*

Promote conservation and encourage development of conservation devices and programs.

*Policy W-3*

Improve the quality of the water supply to all customers.

*Policy W-4*

Encourage private well water users in the planning area to access the City's or other water purveyor systems, provided that the fair share of costs are paid by the benefiting parties.

*Policy W-5*

Insure a cost-effective water supply that meets City needs.

*Policy W-6*

Continue to participate in and facilitate the development of a regional water supply system that effectively balances regional water resources and supply needs, while protecting the City's interests.

*Policy W-7*

Develop agreements with other water purveyors in the Urban Growth Area to consult with the City before approving additional water hookups.

**Sewer System Policies**

*Policy S-1*

Ensure a cost-effective sewer system that meets the City's needs and protects the environment.

*Policy S-2*

Continue to require sewer connections for all new developments, including single-family plats unless otherwise approved by the City.

*Policy S-3*

Encourage existing single-family homes with septic systems to connect to the sewer system where available. If an existing septic system poses a health or environmental problem the homeowner shall be required to connect to the sewer system, if practicable.

**Storm and Surface Water Drainage Utility Policies**

*Policy D-1*

Coordinate management of the stormwater system with property owners to prevent property damage from flooding, protect water quality, maintain recharge of aquifers, provide for the safety and enjoyment of citizens, and preserve and enhance habitat and sensitive areas.

*Policy D-2*

Enforce surface water controls in order to protect surface and groundwater quality.

**Hazardous Waste Policies**

*Policy H-1*

Cooperate with other private and public agencies in the region to manage and control hazardous waste and moderate-risk waste, including hazardous household substances.

*Policy H-2*

Educate the public in the proper handling and disposal of hazardous household waste and on the use of alternative products or practices that result in reducing the use and storage of hazardous materials in the home and businesses.

*Policy H-3*

Hazardous wastes shall be properly disposed of according to procedures and standards set by federal, state, or regional agencies.

*Policy H-4*

Provide for the safe and convenient disposal of hazardous household waste through a conveniently located collection facility or cooperation with county facilities.

*Policy H-5*

Replace, as soon as practicable, the City's old underground fuel storage tanks with new tanks that reduce the potential for groundwater degradation and meets the Washington Department of Ecology's standards.

**Solid Waste Policies**

*Policy SW-1*

Promote the recycling of solid waste materials by providing opportunities for convenient recycling, waste reduction, and source separation.

*Policy SW-2*

Materials remaining after effective waste reduction and source separation shall be handled in accordance with the Tacoma-Pierce County Solid Waste Management Plan.

*Policy SW-3*

The City shall develop recycling programs, including educational materials on recycling, composting, and other waste reduction methods.

*Policy SW-4*

Encourage and actively participate in a uniform regional approach to solid waste management.

*Policy SW-5*

Utilize the public review process in the selection and approval of any disposal facility, considering sensitivity to aesthetics, health effects, and environmental conditions.

*Policy SW-6*

Manage solid waste collection to minimize litter and neighborhood disruption.

*Policy SW-7*

Provide uniform collection service to areas annexed to the City as soon as can reasonably be arranged in accordance with service contracts.

The following section describes Pierce County County-wide Planning Policies and a consistency analysis follows.

**Relationship to Growth Management Plans and Requirements**

*Pierce County Comprehensive Plan*

Policy Overview

The Pierce County Comprehensive Plan adopted in November 1994 and subsequent amendments defined an Urban Growth Area (UGA) by a boundary, which is intended to graphically show the separation of lands expected to be urban from those lands expected to be rural or devoted to mining, forestry, or agriculture. The Growth Management Act (GMA) bestows the responsibility for designating these UGAs upon the County; and further, the Act requires that the designations be contained in the County's Comprehensive Plan. In the County's Plan, the County designates a Comprehensive Urban Growth Area (CUGA) which is intended to set the limits for any further urban sprawl and encourage infilling for the County and the cities and towns within the CUGA. In addition to the CUGA, the County has made certain UGA designations for cities and towns beyond the boundary of the CUGA. These satellite or stand-alone cities or towns are addressed differently than the municipalities within the CUGA. The City of Buckley is designated a satellite or stand-alone city, not located with the CUGA but are located within the Rural Area of Pierce County. For the

County's 1996 amendment, designation of satellite city and town urban growth areas, a UGA was established at the existing jurisdictional boundary for the City of Buckley. The 1994 County Plan designated the City of Buckley's UGA to include portions of unincorporated Pierce County beyond their existing city or jurisdictional limits. These designations are based upon the jurisdictions' commitment and apparent ability to provide urban level services and facilities to these areas. Ultimately, the specific activities and land uses encouraged within these areas and the growth management system used will be identified through a joint planning process and subsequent negotiation and execution of Interlocal Agreements (ILAs).

As stated in the County's Comprehensive Plan, rural areas are defined as, outside the Urban Growth Area, but not including designated agricultural, forestry, or mining areas of long-term commercial significance. The context of rural areas is provided by the adjacent lands, such as designated forest land, and the land uses, such as designated agricultural land, that are interspersed within the rural areas. Typically, rural areas have received their identity from a rural way of life rooted in history and resource-based industries such as commercial fishing, aquaculture, lumber milling, logging, dairying, daffodil or berry farming, horse ranching, and mining. The Rural Center Alternative is consistent with the rural environment described in the County Plan. In rural areas, the primary objectives of the County Plan are:

> Encourage diverse economic vitality in ways that protect the rural way of life and are compatible with the rural environment.
>
> Allow a range of rural densities within the carrying capacity of the natural environment.
>
> Allow a mix of uses that could include Rural Activity Centers, Rural Neighborhood Centers, and Rural Gateway Communities.
>
> Direct higher intensity mixed use development into rural centers, appropriate in character and scale to the rural environment.

*Countywide Planning Policies*

- Include the timing, phasing, and location of sewer interceptor expansions in the capital facilities element of the County Comprehensive Plan and ensure consistency with countywide planning policies, the Urban Growth Area boundaries and the Comprehensive Plan. Coordinate phased expansions with the municipalities and give priority to existing urbanized unincorporated areas within the Urban Growth Area and to existing municipalities that do not have the ability to add capacity. (Urban Growth Policy 3.4.1)

Response

Planned improvements to the City's system include upgrading existing trunk lines with downstream trunk lines being replaced first. Additionally, the City of Buckley will also accept wastewater from the Rainier School that is within the City limits.

- Extend sewer interceptors outside of the Urban Growth Area only where: (i) sewer service will remedy groundwater contamination and other health problems by replacing septic systems and community on-site sewage systems, or (ii) a formal binding agreement to service an approved planned development was made prior to the establishment of the Urban Growth Area. (Urban Growth Policy 3.4.2)

Response

The City has an existing policy not to allow extension of their sewer line outside of their incorporated area. This is consistent with any UGA area.

> Ensure that sewer interceptors inside the Urban Growth Areas follow Tier phasing of capital facilities (1-6), (7-13), (14-20) unless: (i) sewer service will remedy groundwater contamination and other health problems by replacing septic systems and community on-site sewage systems, or (ii) a formal binding agreement to service an approved planned development was made prior to the establishment of the Urban Growth Area. (Urban Growth Policy 3.4.2)

Response

Existing City policy provides that where a City sewer line is extended along properties that have private or community septic system, all residences are required to connect to the new City sewer line.

> Prohibit availability of sewer service connections from interceptors to properties along the interceptor alignment where urban intensity development is not consistent with the Urban Growth Area boundary or tier designations and the County Comprehensive Plan. (Urban Growth Policy 3.4.2)

Response

See response to UGP 3.4.1. Development within the UGA and eventual urbanization with necessary public services and utilities is planned. The extension of services from existing systems is planned as an incremental expansion into an immediately adjacent area.

> Recognize the necessity of adopting policies on the location and use of on-site and community sewage systems to protect the public health and safety of the citizens of Pierce County and to preserve and protect environmental quality and to protect aquifer recharge areas. (Urban Growth Policy 3.4.3)

Response

On-site and community septic systems are not proposed in the City of Buckley Comprehensive Plan. If the City sewer line is extended adjacent to residences with septic systems, City policy requires that a new sewer connection be provided.

> Prohibit the use of availability or potential for availability of sewer treatment plant capacity as justification for expansion of the sewer system or development in a manner inconsistent with the County-Wide Planning Policy, Urban Growth Area boundaries and the County Comprehensive Plan. (Urban Growth Policy 3.4.4)

Response

Any planned expansion of the City of Buckley sewer system would need to be included in an updated Comprehensive Plan. See also response to UGP 3.4.1.

> Integrate land use and transportation planning with health and human services planning to promote service delivery at affordable costs. (R-5)

Response

All City roadways would need to meet applicable roadway standards for safe movement and access of emergency vehicles.

- Coordinate planning efforts among jurisdictions, agencies and federally recognized tribes where there are common borders or related regional issues to facilitate a common vision, consistency and effective implementation of planning goals. (RI-1)

Response

The City of Buckley plan policies were developed through a cooperative effort with Pierce County when developing the Pierce County Comprehensive Plan.

> Protect significant regional open space, resource lands and critical areas through inter-jurisdictional planning by the identification, designation, preservation and enhancement of these lands, including linkages and networks. (RO-3)

Response

The Land Use Element Policies allow for and encourage clustering concepts that provide open space areas to accomplish retention of open space for passive recreation, use compatibility, habitat conservation corridors, and the protection and preservation of environmentally sensitive areas.

> Frame and separate central places and urban growth areas by creating and preserving a network of permanent urban and rural open space, including parks, recreation areas, critical areas, and resource lands. (RO-4)

Response

Clustering concepts will better retain open space, habitat corridors, and environmentally sensitive areas.

> The designated Urban Growth Area must be of sufficient size to accommodate only the urban growth projected to occur over the succeeding 20-year planning period. (Urban Growth Policy 2.1.1)

Response

The growth plan for the Urban Growth Area for the City of Buckley will be of sufficient size to accommodate anticipated growth in the next 20-year time frame. The Land Use Element policies state that these growth boundaries will be reviewed periodically based on an updated 20-year population projection.

> Consider any of the following in determining the location of urban growth area boundaries: geographic, topographic, and manmade features; public facility and service availability, limits and extensions; jurisdictional boundaries including special improvement districts; location of designated natural resource lands and critical areas; avoidance of unserviceable islands of County land surrounded by other jurisdictional entities; or Vision 2020 urban/rural line and PSAPCA burn ban line. (Urban Growth Policy 2.2)

Response

Clustering concepts will better retain open space, habitat corridors, and environmentally sensitive areas. Determination of the UGA used several criteria to determine a logical extension of existing City boundaries including citizen preferences, logical topographic boundaries, containment of urbanized growth areas, and compatible uses with adjacent resource and critical areas.

> Designate tiers within the designated Urban Growth Area to discourage urban sprawl and leapfrog development and encourage adequate public facilities and services concurrent with development. (Urban Growth Policy 2.3.1)

Response

See response to UGP 3.4.1. Development within the UGA and eventual urbanization with necessary public services and utilities is planned. The extension of services from existing systems is planned as an incremental expansion into an immediately adjacent area.

> Adopt a process as well as standards and criteria by which a shift of land from one tier to another would take place. (Urban Growth Policy 2.3.2)

Response

See relevant Land Use Element policies and policies relating to on-site transfer of density from environmentally sensitive areas.

> Relate the primary growth area (Tier 1) to the County's 6-year capital facilities plan; ensure that urban growth in the primary urban growth area is sensitive to compatibility and fit with the type and density of existing development. (Urban Growth Policy 2.3.3)
>
> Relate the secondary, (years 7-13) and tertiary (years 14-20) growth areas to the long-range planning, capital improvement and service provision horizon. (Urban Growth Policy 2.3.4)
>
> In the secondary and tertiary (if applicable) growth area, make various techniques available to property owners to ensure a reasonable use within a reasonable period of time. (Urban Growth Policy 2.3.5)
>
> Condition approval of new fully contained communities within the current tier or subsequent tiers on inclusion of a phasing plan to ensure that the various segments of the development are timely served by adequate public facilities and services. (Urban Growth Policy 2.3.6)

Response

Tier 1 (primary) growth is addressed under the City's 6-year capital facilities plan. Development within the UGA and eventual urbanization with necessary public services and utilities is planned. The extension of services from existing systems is planned as an incremental expansion into an immediately adjacent area.

> Allow extension of the Urban Growth Area to accommodate build-out of newly developed areas only if development capacity within municipal urban growth boundaries and growth in the areas identified in Policy 2.5 above is determined to be inadequate to meet total population and employment projections consistent with the other County-Wide Planning Policies. (Urban Growth Policy 2.6)

Response

The Land Use Element policies state that these growth boundaries will be reviewed periodically based on an updated 20-year population projection.

> Adopt measures to ensure that growth and development within the Urban Growth Area is timed and phased consistent with the provision of adequate public facilities and services. (Urban Growth Policy 3)

Response

See response to UGP 3.4.1. Development within the UGA and eventual urbanization with necessary public services and utilities is planned. The extension of services from existing systems is planned as an incremental expansion into an immediately adjacent area.

> Adopt plans and implementation measures to ensure that sprawl and leapfrog development are discouraged. (Urban Growth Policy 3.6)

Response

The Land Use Element contains policies which reduce sprawl and leapfrog development including using the urban growth area as a focus for designation of residential densities to avoid sprawl and provide for logical services and planning for public facilities and utilities. The designated UGA would meet the following criteria including: containing areas characterized by urban growth; areas to be served or planned to be served by municipal facilities and services; uses would be compatible with the use of designated resource lands and critical areas following logical boundaries.

> Use joint municipal-County planning for designated Urban Growth Areas of municipalities, outside of municipal corporate limits. Joint jurisdictional planning shall occur in those other areas where the respective jurisdictions agree such joint planning would be beneficial. (Urban Growth Policy 4)

Response

The City of Buckley plan policies were developed through a cooperative effort with Pierce County. The City has joined other cities in Pierce County through the Pierce County Regional Council (PCRC) to negotiate an interlocal planning agreement.