City of Langley
2015 General Sewer System Plan

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Executive Summary

In July 2014, the City Council of Langley authorized PACE Engineers, Inc. to develop a Comprehensive Sewer System Plan to meet the rules and regulations of Washington State Department of Ecology (Ecology) regarding general sewer plans and update the City's 2006 Sewer Plan. This Plan has been developed to meet the minimum state requirements put forth in the Washington Administrative Code 173-240 (WAC). It has been prepared consistent with the policies, codes and requirements of the City of Langley and Island County.

The service area includes approximately 650 acres of land within the current City of Langley limits. The previous Urban Growth Area (UGA) was used for sewer planning and includes approximately 450 acres surrounding the current City Limits. Population and flow projections have been developed for both the City Limits and the previous UGA. The sewer system serves approximately 60% of the population and essentially all of the businesses, the middle school, and the fairgrounds. Currently, no properties outside the City limits are served by the existing sanitary sewer system.

The existing sewer service area, is generally bounded by Saratoga Passage (on the north), DeBruyn Avenue, Park Avenue, and Anderson Road (on the west), Sixth Street and the southern end of the Northview Subdivision (on the south), and the east end of the Noble Cliff Subdivision (on the east).

As of December 2014, the sewer system had a total of approximately 450 sewer billing accounts. Of the 450 accounts, 111 are commercial, 4 are public facility, 37 are multifamily and 298 are residential. The system is comprised of three drainage basins, 6.87 miles of pipe, three pump stations, and a 0.15 MGD wastewater treatment plant. Currently, most of the system flows to Pump Station No. 1 which ultimately pumps to Pump Station No. 2. In addition to the flow from Pump Station No. 1, Pump Station No. 2 receives a minor amount of sewer flow directly into its wet well. All flow from Pump Station No. 2 is pumped to the Wastewater Treatment Plant (WWTP). The treated effluent is discharged through approximately 7,200 feet of outfall pipe into the waters of Puget Sound's Saratoga Passage.

The existing collection system is in relatively good condition. The capacity in the system is adequate.

The pump stations are operating satisfactorily. Currently there are three City-owned wastewater pump stations in the system. The Sunrise Beach Pump Station is located at the base of Wharf Street. Pump Station No. 1 is located at Seawall Park (site of the former wastewater treatment facility). Pump Station No. 2 is located at the corner of Second Street and DeBruyn Avenue.

The wastewater treatment plant is operating well and consistently produces an effluent that is well within permit limits. Flow data for 2012 and 2013 show that flows have been very uniform over that period. The average flows for these years were 0.075 mgd and 0.065 mgd, respectively. The average maximum monthly flows were also very similar at 0.10 mgd and 0.09 mgd, well within the 0.15 mgd capacity. Maximum average influent BOD and TSS loads in 2013 were 263 lbs BOD/day and 214 lbs TSS/day.

System recommendations were made for each component of the sewer system. These recommendations include operation and maintenance of the collection system and the treatment facility. The City's CIP (Capital Improvements Program) was derived from the recommendations. The

existing system remediation and expansion improvements were prioritized into intermediate, near term and long-term improvements. The improvements are summarized in the City's six year CIP which provides a schedule, cost estimate, and the potential funding mechanism.

Financing and implementation for the recommended improvements are discussed in Chapter 7, which also summarizes financial policies and capital funding sources, and provides a financing plan for the capital improvements along with impacts on rates and other fees.

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ACRONYMS

ADD Average Daily Demand

ccf One hundred cubic feet

cfs Cubic Feet per second

CIP Capital Improvements Plan

DOE Washington State Department of Ecology

DOH Washington State Department of Health

DOT/APWA Standard Specifications for Road, Bridge, and Municipal Construction, Washington State Department of Transportation and the American Public Works Association, 2000 Edition

EPA United States Environmental Protection Agency

ERU Equivalent Residential Unit

GFC General Facility Charge

GMA State of Washington Growth Management Act

gpcd Gallons per capita per day

gpd Gallons per day

gpd/sf Gallons per day per square foot

gpm Gallons per minute

I&I Infiltration and Inflow

LFC Local Facility Charge

MDD Maximum Daily Demand

MG Million Gallons

Mgd Million gallons per day

mg/l Milligrams per liter. See also "ppm"

PDF Peak day flow

PHD Peak Hour Demand

ppd Pounds per day

ppm Parts per million

PSRC Puget Sound Regional Council

PRV Pressure Reducing Valve

psi Pounds per square inch

RCW Revised Code of Washington

SEPA State Environmental Policy Act

ULID Utility Local Improvement District

WAC Washington Administrative Code

WWTP Wastewater Treatment Plant

TERMS

Activated Sludge Process: A biological wastewater treatment process whereby a mixture of wastewater and activated sludge is agitated and aerated. The activated sludge is subsequently separated from the treated wastewater (mixed liquor) by sedimentation, and wasted or returned to the process as needed.

Aeration: The bringing about of contact between air and a liquid by one or more methods, such as spraying the liquid in the air, bubbling the air through the liquid, or agitation of the liquid to promote surface absorption of the air.

Anaerobic: An environment devoid of oxygen and nitrate.

Anoxic: An environment devoid of oxygen where nitrate acts as the electron acceptor.

Aquifer: A porous, water-bearing geologic formation. Generally restricted to materials capable of yielding an appreciable supply of water.

Average Annual Flow (AAF): The average day flow for the entire year.

Average Dry Weather Flow (ADWF): ADWF is the flow for an average day during the dry weather months of May through October, and represents the baseline of sewage flow for the service area. The ADWF includes sewage discharges plus the average amount of groundwater infiltration (base GWI) which occurs throughout the dry season. Peaking factors for existing flows are derived on the basis of ADWF.

Average Wet Weather Flow (AWWF): AWWF is the flow for an average day during the wet weather months of November through April. The AWWF includes sewage discharges, groundwater infiltration and stormwater inflow which occurs throughout the wet season.

Biochemical Oxygen Demand - Five Day (BOD5): The quantity of oxygen required to support biological oxidation of the organic matter contained in wastewater. Usually referred to as BOD, this characteristic defines the strength of a wastewater and often determines the type and degree of treatment which must be provided to produce a required effluent quality. BOD is commonly

expressed as the amount of oxygen utilized in the oxidization of organic matter over a five-day period at 20˚C.

Carbonaceous Biochemical Oxygen Demand (CBOD): Similar to biochemical oxygen demand, except that nitrification is excluded from the oxygen demand calculation. CBOD is measured using nitrification inhibiting agents.

Combined Sewer: A sewer which receives both wastewater and storm or surface water.

Commercial Wastewater: Wastewater generated in predominantly business or commercial areas, including both sanitary wastes and wastes from the commercial activities. Typically, commercial wastewater includes, but is not limited to, wastes from restaurants, laundromats, and service stations.

Denitrification: Removal of nitrogen from wastewater by convection of nitrate into nitrogen gas under anoxic conditions.

Domestic Wastewater: Wastewater principally derived from the sanitary conveniences of residences or produced by normal residential activities.

Dry Weather Flow: Wastewater flow during periods of little or no rainfall; in the Puget Sound area, this typically occurs during the months May through October. Rates of flow exhibit hourly, daily, and seasonal variations. A certain amount of infiltration may also be present.

Dry Well: The dry compartment in a sewer lift station, near or below pumping level where the pumps and/or motors and controls are located.

Force main: A sewer pipeline that flows full under pressure, discharging from a lift station (as opposed to an inverted siphon).

Hydrogen Sulfide: A potentially toxic and lethal gas (chemical symbol H2S) produced in sewers and digesters by anaerobic decomposition. Detectable in low (<0.0001 percent) concentrations by its characteristic "rotten egg" odor, it deadens the sense of smell in higher concentrations or after prolonged exposure.

Infiltration: The quantity of groundwater that leaks into the wastewater collection system from the surrounding soil. Common points of entry include broken pipes and defective joints in the pipe or in walls of manholes. Infiltration may result from defective sewers being located below the groundwater table or from saturation of the soil by rain or irrigation water. Infiltration is divided into two categories: Groundwater-Related Infiltration (GWI) which occurs throughout the year, and Rainfall-Dependent Infiltration (Rain GWI) which occurs during and shortly after storm events as a result of temporarily raising the groundwater table.

Inflow: Rainwater which enters the collection system through roof drain connections, catch basin connections, and holes in the tops of manhole covers in flooded streets. Inflow is generally distinguished from infiltration by the rapidity with which inflow begins and ends after a period of rainfall.

Interceptor: A sewer that receives flow from a number of main or trunk sewers, force mains, etc.

Lateral: A sewer that has no other common sewers discharging into it.

Main: A sewer that receives flow from one or more submains. Also referred to as "trunk."

Nitrification: The process of converting organic and ammonia-nitrogen into nitrate nitrogen by nitrifying autotrophic bacteria.

Nitrogen: An essential nutrient that is often present in wastewater as ammonia, nitrate, nitrite, and organic nitrogen. The concentrations of each form and the sum, total nitrogen, are expressed as mg/l elemental nitrogen. Also present in some ground water as nitrate and in some polluted ground water in other forms.

Peak Day Flow (PDF): The maximum flow received over a calendar day, usually occurring during the wet weather.

Peak Design Flow/ Peak Hour Flow (PHF): The largest estimated flow sustained over a 60-minute period in the design year of the wastewater facility.

Peak Month Flow (PMF): The largest estimated flow rate sustained over a calendar month.

pH: A measure of the hydrogen-ion concentration in a solution, expressed as the logarithm (base ten) of the reciprocal of the hydrogen-ion concentration in gram moles per liter. On the pH scale (0-14), a value of 7 at 250C represents a neutral condition. Decreasing values, below 7, indicate increasing acidity; increasing values, above 7, indicate increasing alkalinity.

Phosphorus: An essential chemical element and nutrient for all life forms. Occurs in orthophosphate, pyrophosphate, tripolyphosphate, and organic phosphate forms. Each of these forms is expressed as mg/l elemental phosphorus.

Revised Code of Washington (RCW): Compilation of laws passed by the State legislature.

Sewerage: A complete system of piping, pumps, basins, tanks, unit processes, and appurtenances for the collection, transporting, treating, and discharging of wastewater. Term is declining in use, generally being replaced by sewer system or wastewater facilities.

Submain: A sewer that receives flow from one or more lateral sewers.

Suspended Solids (SS): The suspended undiluted material transported in wastewater. The quantity of suspended material removed during treatment varies with the type and degree of treatment and has an important bearing on the size of many mechanical and process units. Also referred to as "Total Suspended Solids (TSS).

Total Suspended Solids (TSS): See "Suspended Solids."

Trunk: A sewer that receives flow from one or more sewer mains. See “Main”.

Volatile Suspended Solids (VSS): The organic portion of the total suspended solids which will oxidize and be driven off as a gas at 600˚C. VSS typically represents 75 to 85 percent of the TSS for digested and undigested sludge.

Washington Administrative Code (WAC): Document which consists of regulations adopted by the State to carry out the RCW.

Wastewater: Water-carried wastes from residences, businesses, institutions, and industrial establishments, together with such ground and storm waters as may be present.

Wastewater Treatment Plant (WWTP): A water pollution control facility engineered and constructed to remove pollutants from wastewater. Also referred to as a sewage treatment plant.

Wet Weather Flow: Wastewater flow during or following periods of moderate to heavy rainfall; in the Pacific Northwest, this typically occurs during the months November through April. Infiltration and inflow may increase the wet weather flow to a rate many times greater than the dry weather flow, and unless provided for in sewerage design, can produce hydraulic overloads resulting in wastewater overflows to streets or water courses.

Wet Well: The compartment in a lift station where wastewater flow is collected and from which the pumps intake wastewater to be discharged into a force main.

Chapter 1: Introduction

1.1 AUTHORIZATION & SCOPE OF WORK

In July 2014, the City Council of Langley authorized PACE Engineers, Inc. to develop a General Sewer System Plan to meet the rules and regulations of Washington State Department of Ecology (Ecology) regarding general sewer plans and update the City's 2006 Sewer Plan. This Sewer Plan has been developed to meet the minimum state requirements put forth in the Washington Administrative Code 173-240 (WAC). It has been prepared consistent with the policies, codes and requirements of Island County and the City of Langley.

1.2 OBJECTIVE

The objective of this General Sewer Plan is to prepare a document that will serve as a guide for the development of the public sanitary sewer system owned and operated by the City of Langley. The Plan evaluates the adequacy of the sewer system under existing (2014) conditions and the ability to accommodate projected development through the year 2035. Specific objectives of this plan include assimilation of background reports and general planning data; evaluation of service within the City's Urban Growth Area (UGA) and service area boundaries, including a review of the current condition of the City's existing sewer system and wastewater treatment facility; system revisions and additions since the 2006 Sewer Plan; development of a program of capital improvements based on updated projected growth and system needs; and an analysis of the City's financial capabilities in conjunction with the capital improvement program.

This Plan complies with the provisions of the City's National Pollution Discharge Elimination System (NPDES) Permit No. WA-002070-2 (i.e., flow and loading limits). Development of this has been coordinated with the City's 2013 Comprehensive Land Use planning efforts to ensure consistency with the 1990 Washington State Growth Management Act (GMA) and subsequent updates. In addition, the Plan has been prepared to be in compliance with State Environmental Policy Act (SEPA) and a SEPA checklist and threshold determination are included in Appendix A.

1.3 LOCATION

The City of Langley is situated on the eastern shore of Whidbey Island, near the southern end of the Island. The City faces Saratoga passage, which is the channel between Whidbey and Camano Islands (see Site Vicinity Map, Figure 1-1). Langley is about 5 miles northeast of the Washington State Ferry landing at Clinton and about 2.5 miles north of State Highway 525, the main road running north-south through Whidbey Island. Langley is the only incorporated city in the southern portion of Whidbey Island.

1.4 BACKGROUND & SYSTEM HISTORY

1.4.1 Background

Population settlement has occurred irregularly within the City, with the density of settlement increasing toward the center of Langley, where sewers are in place. The lack of sewer mains in the more western and eastern sections of the City has limited residential development in

those areas. The City's 2013 Comprehensive Plan and includes an Urban Growth Area (UGA) boundary which, in general is the boundary within which the City plans for public utilities (including sewers) and other urban services. In addition, the City maintains a Joint Planning Area (JPA) with Island County. The JPA is an area that is subject to procedures that allow for City input into the County development review process. The JPA is an area in which the City could provide urban services beyond the planning horizon, therefore, for the purposes of this plan, the UGA is the boundary for planning utilities.

1.4.2 History

The original wastewater collection system was a combined system carrying both sanitary wastewater and storm water. It consisted of a 12-inch pipe up Anthes Avenue from the beach to Fourth Street, with branch lines east on First Street and in the alley between First and Second Streets. In 1960 and 1961, with the construction of improvements to First Street and Anthes Avenue, the sewer was separated into both a sanitary sewer system and storm drainage system. In 1962, the City and the school board jointly financed the construction of a 10-inch interceptor sewer from Second Street and Anthes Avenue to the school on Camano Avenue. Most of the existing sewers are concrete pipe with rubber gasket joints and newer Polyvinyl Chloride (PVC) pipelines.

Over time, the system has been expanded through several Local Improvement Districts (LIDs), Utility Local Improvement Districts (ULIDs), and developer extensions. The most recent ULID, ULID No. 8, involved the construction of Pump Station Nos. 1 and 2, as well as force main, outfall, and some collection system improvements.

The original wastewater treatment plant located at the base of Anthes Avenue at Seawall Park was constructed in 1963, with improvements made in 1972. The plant consisted of a grit chamber, communitor, clarifier, solids digester, and chlorinator. The original 8-inch outfall discharged treated effluent 890 feet from shore into Saratoga Passage. The capacity of the original facility was approximately 90,000 gallons per day (gpd). In 1992, a secondary wastewater treatment facility was constructed at the southwestern edge of the City on Coles Road. The new plant uses Sequencing Batch Reactors (SBRs) which are described in detail later in this plan. The location of this new plant requires the influent wastewater to be pumped over a mile through an 8-inch force main from the location of the old primary treatment facility at Seawall Park by two lift stations (Nos. 1 and 2). The old primary wastewater treatment facility was removed and the old manholes and outfall were abandoned, with the exception of the treatment tank, which was converted into a generator building with an observation deck constructed on top. With the installation of this new secondary treatment plant, the capacity was increased from approximately 90,000 gpd to 150,000 gpd. This increased capacity was designed to handle estimated influent flows until 2012.

The City has experienced little growth since the 2006 General Sewer Plan was adopted. This is discussed further in Chapter 2 (General Planning Data). Projects completed since 2006 are summarized in Chapters 4 and 5, but are generally limited to improvements at the treatment plant and dewatering system, Infiltration & Inflow (I&I) reduction improvements (i.e., removal of storm drain connections and manhole cover replacements, etc.) and small, localized additions and betterments.

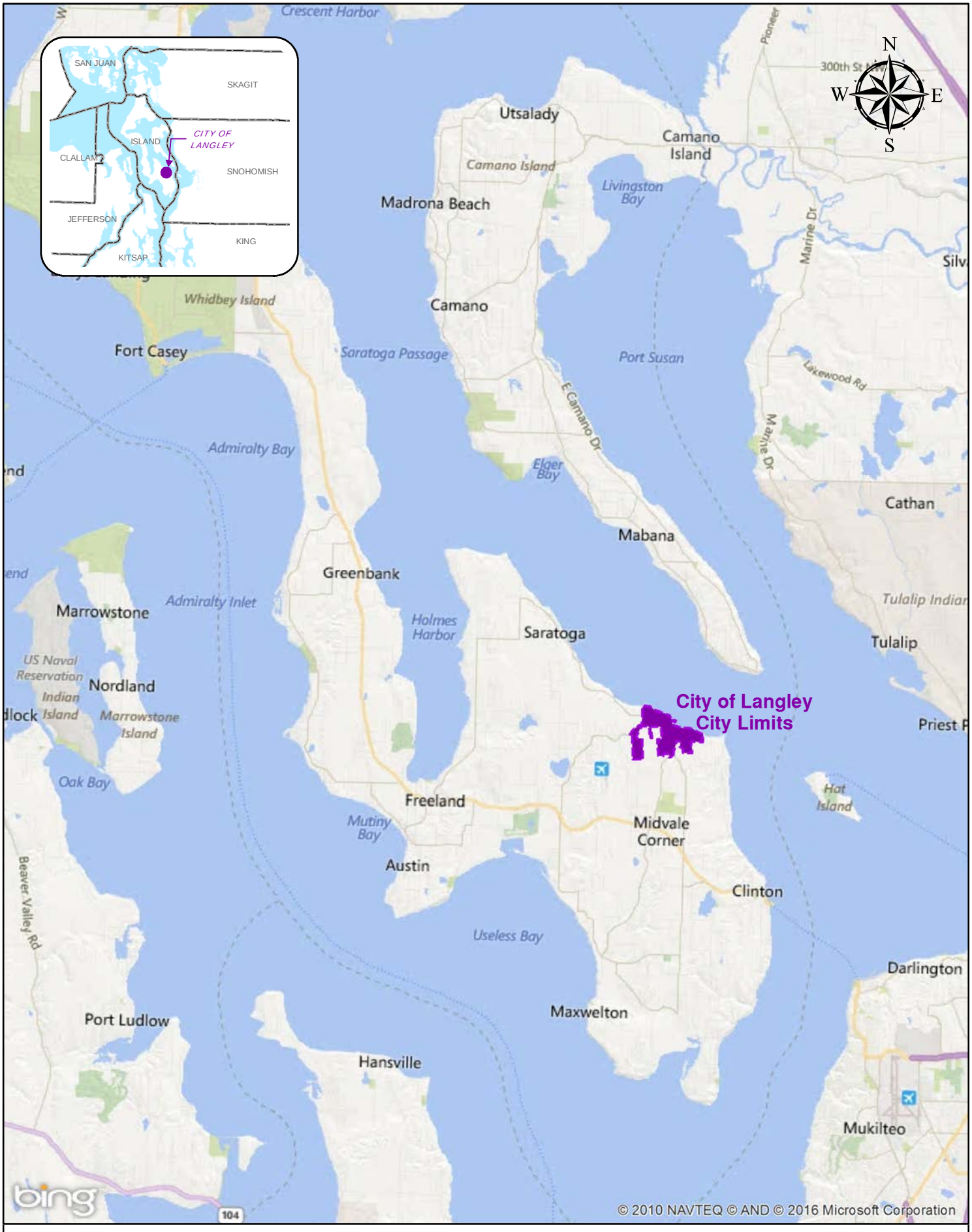

Figure 1-1
VICINITY MAP
CITY OF LANGLEY

J:\UtilityDistrictsAndCompanies\LangleySewerDistrict\GIS\ArcMapDoc\Chapter Figures\Figure 1-1 Vicinity Map.mxd

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1.5 AUTHORITY, MANAGEMENT, & CONDUCT OF BUSINESS

The City of Langley is authorized and granted certain powers under by the State of Washington under the Revised Code of Washington (RCW) Title 35 (Cities and Towns). It is under this authority that the City operates its public sanitary sewer system and other governmental services. The City operates under a mayor and a five person City Council that are elected by the citizens of the City. The ordinances and policies of the Council establish the policies of the sanitary sewer system and govern connection to, and operation of, the system. Direct responsibility for the sanitary sewer collection system and treatment plant is the responsibility of the City's Public Works Director/City Engineer.

The Director of Public Works has the overall responsibility of day to day operation of the treatment plant and collection system. The City employs a Utilities Supervisor, and a Public Works Department field staff of three permanent employees.

Engineering, legal counsel and financial support are provided by outside consultants selected by the City Council.

1.6 REGULATORY REQUIREMENTS

The City operates the sanitary sewer collection system and wastewater treatment plant under a variety of rules and regulations, some of which are listed below. More detailed discussions of the specific regulations which affect various facets of the City's operation can be found in the appropriate sections of this Plan.

1.6.1 Federal Requirements

The City of Langley must operate within the regulations and requirements established by the federal government, as applicable, including the Clean Water Act (Federal Water Pollution Control Act), U.S. Army Corps of Engineers Permit requirements, the ESA (Endangered Species Act), and CMOM (Capacity, management, Operations and Maintenance) Regulations.

1.6.1.1 Clean Water Act

The Clean Water Act puts forth regulations and requirements for restoration and maintenance of the integrity of the nation's waters in terms of physical, chemical and biological characteristics. The U.S. EPA (Environmental Protection Agency) is the primary administrator of the Clean Water Act but has delegated many aspects of administration of the Act to the State of Washington Department of Ecology (Ecology), including: the NPDES (National Pollution Discharge Elimination System) permit program; Biosolids regulations (40 CFR 503); and Pretreatment Regulations (40 CFR 503). Additional discussion on NPDES permit for the City is presented later in this Section.

1.6.1.2 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers has jurisdiction over waterways and wetlands of the United States. As such, any modifications to a treatment plant outfall or construction of facilities in the vicinity of wetlands or navigable waters may require a permit from the Corps of Engineers.

1.6.1.3 Endangered Species Act

Rules and regulations under the authority of the ESA (Endangered Species Act) will effect collection sewer system and treatment plant operations. Because the City operates a wastewater treatment plant and is responsible for the disposal of treated effluent and waste, compliance issues relating to treatment and disposal are managed and enforced by the City in accordance with the "4d" rule[1].

In addition, the "4d" rule may impact operation and maintenance activities. The City is responsible for assessing any and all activities that may affect anadromous fish or reduce their habitat or affect stream levels and the rate or volume of water discharge into open waters. As part of its ESA compliance program, the City is prepared to retain qualified consultants (on its own or through associations and organizations to which it belongs) to train selected staff as BMP (Best Management Practices) compliance officers, who would monitor all projects for ESA compliance.

1.6.1.4 Capacity, Management, Operations, & Maintenance

CMOM (Capacity, Management, Operations, and Maintenance) Regulations are anticipated in the future as part of the Environmental Protection Agency's SSO (Sanitary Sewer Overflow) Rule under the NPDES (National Pollution Discharge Elimination System) policy. CMOM will require sanitary sewer collection system owners to develop a program to address and reduce sanitary sewer overflows.

1.6.2 State of Washington Requirements

The City of Langley operates its sewer system under the general rules and regulations put forth in Title 35 (Cities and Towns). Title 35.67 (Sewerage Systems – Refuse Collection and Disposal) establishes a variety of regulations for sewer operation and specifically addresses requirements for detailed comprehensive planning for the system. Additional requirements for various aspects of sewer operation in a means consistent with the protection of the health and safety of the environment and the general public are found throughout the laws of the State of Washington. A summary of key regulations that apply to the City of Langley is as follows.

1.6.2.1 Department of Ecology Regulations

Approval of this document and operation of the sanitary sewer system (consistent with the requirements of RCW 90.48.110 and WAC 173-240-050) is under the jurisdiction of Washington State Department of Ecology (Ecology). This document has therefore been prepared, and the City is operated, in accordance with the requirements set forth in the Ecology's "Criteria for Sewage Works Design" (Orange Book, August 2008), which incorporates the policies, guidelines and practices of the Ecology and identifies the

[1] Section 4(d) of the ESA allows the USFWS to establish special regulations for threatened (not endangered) species, subspecies, and Distinct Population Segments. These "4(d) rules" take the place of the normal protections of the ESA and may either increase or decrease the ESA's normal protections. The ESA specifies that 4(d) rules must be "necessary and advisable to provide for the conservation of such species."

minimum engineering requirements for design, construction and operation of a public sanitary sewer system.

There are a number of relevant regulations which are published in the Washington Administrative Code (WAC) and carried out by Ecology, as described briefly below.

1.6.2.1.1 *State Environmental Policy Act*

SEPA (State Environmental Policy Act) review is a requirement for many of the City's capital improvement projects in order to insure that environmental concerns associated with construction are adequately addressed. Initiation of the SEPA process can be at the City's direction or as required for various permits. SEPA requirements and guidelines are presented in WAC 197-11.

1.6.2.1.2 *Growth Management Act*

The GMA (Growth Management Act) has a direct impact on utility system planning as it requires a complete inventory of existing facilities and a comprehensive effort toward the capability of existing systems to accommodate future growth. This Plan has been developed consistent with County-wide and local GMA planning policies. In addition, the comprehensive plan has considered the Growth Management Act's thirteen goal areas and has incorporated these goals, where applicable.

1.6.2.1.3 *Water Quality Regulations*

Ecology's water quality standards for surface waters of the State are published at WAC 173-201A. Specific water quality classifications for surface water bodies are identified in this regulation. Ecology policy calls for the highest possible quality for all of the waters of the State. The anti-degradation policy is part of WAC 173-201A. The anti-degradation policy states that "1) existing beneficial use shall be maintained and protected; 2) where natural conditions are of a lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria; 3) water quality shall be maintained and protected in water designated as outstanding resource water 4) whenever waters are of a higher quality than the criteria assigned for said water, the existing water quality shall be protected and pollution of said waters that will reduce the existing quality shall not be allowed; 5) only short term modification of water quality standards will be permitted." The provision for AKART, "(all known, available, and reasonable methods of prevention, control and treatment) by new and existing point sources before discharge" is a provision of the anti-degradation regulation (WAC 173-201A-070). Mixing zone regulations for wastewater treatment plant outfalls are specified in WAC 173-201A-100.

1.6.2.1.4 *NPDES Permit Regulations*

Rules for the NPDES (National Pollutant Discharge Elimination System) permit program appear in WAC 173-220 and WAC 173-221 and are administered by Ecology. NPDES permits address the point source discharge of pollutants into

navigable waters of the state. Each NPDES permit is tailored for each separate wastewater facility, while maintaining Ecology's high overall standards of protection based on the AKART policy.

Facility discharge standards are published in the Washington Administrative Code in WAC 173-221-040, while alternative standards are presented in WAC 173-221-050. Domestic wastewater plant NPDES permit fees are established in WAC 173-224. The NPDES permit covering the City's wastewater treatment plant are discussed in Chapter 5 and included in Appendix C to this plan.

1.6.2.1.5 *Infiltration & Inflow*

Ecology can require reductions in infiltration and/or inflow (I&I) in situations where the influent dilution affects achievement of the 85 percent BOD and the suspended solids minimum removal limit. Ecology follows the federal regulations for I&I determinations (40 CFR 35.927.1; 40 CFR 35 app.; 40 CFR 35.2120). State and federal regulations require that recipients of loan or grant monies demonstrate that their sewer collection systems are not subject to excessive I&I. The determination of excessive is based on economics; i.e. is it more economical to eliminate than to convey and treat.

1.6.2.1.6 *Engineering Design Criteria*

Ecology's Orange Book, "Criteria for Sewage Works Design," identifies the minimum engineering criteria for design, construction, and operation of public sanitary sewer systems and wastewater treatment facilities. This Plan has been prepared generally in accordance with the requirements set forth in the August 2008 edition of the Orange Book.

1.6.2.1.7 *Contract Documents*

The City of Langley is required to submit plans to Ecology according to WAC 173-240, "Submission of Plans and Reports for Construction of Wastewater Facilities".

The City has received Ecology approval for a general sewer plan and standard design criteria, therefore engineering reports and plans/specifications for sewer extensions or lift stations do not have to be submitted for approval (WAC 173-240-030(5)). However, if the proposed sewers or lift stations involve installation of overflows or bypass facilities, or if these facilities discharge to an already overloaded treatment, collection, or disposal facility, then full planning documentation must be submitted to Ecology for approval.

Requirements for an engineering report for a wastewater treatment plant are provided in WAC 173-240-060; requirements for plans and specifications for construction at a wastewater treatment plant are provided in WAC 173-240-070, while requirements for operations and maintenance manuals are in WAC173-240 080.

1.6.2.1.8 *Shoreline Management Act*

The Shoreline Management Act (RCW 90.58) requires local governments to establish a program for the administration and enforcement of the permit system for shoreline management. WAC 173-27, "Shoreline Management Permit and Enforcement Procedures", sets forth regulations to provide minimum procedural requirements as necessary to comply with statutory requirements while providing latitude for local government to establish procedural systems based on local needs and circumstances. Shoreline permits are under the authority of Ecology, however, local governments have primary responsibility for administering the regulatory program.

1.6.2.2 Fish & Wildlife

The Washington Department of Fish and Wildlife administers the State Hydraulic Code (WAC 220-110). Its purpose is to establish regulations for the construction of hydraulic projects or performance of work that will use, divert, obstruct, or change the natural flow or bed of any salt or fresh waters of the state and sets forth procedures for obtaining a hydraulic project approval (HPA). The regulations reflect the best available science and practices related to protection of fish life. Receipt of a completed hydraulic project application, forest practice application or a section 10 or 404 public notice from the Corps of Engineers or Coast Guard constitutes application for an HPA.

1.6.3 City Requirements

This Plan has been developed in accordance with a variety of plans, policies and regulations put forth by the City of Langley. The City must rely on agreements and the regulations of the County and state regulations, for construction and maintenance of its collection and treatment facilities. Requirements for compliance and/or consistency with the following documents should be evaluated:

- Comprehensive land use plans,
- Sewer and other utility plans,
- Zoning and right-of-way use regulations,
- Shoreline master plans,
- Franchise agreements,
- Development and sensitive area regulations, and,
- GMA designations.

Prior to construction, permits may be needed for filling and grading, building, electrical, mechanical, plumbing, construction, and right of way street use. As part of construction permitting, erosion control and traffic management will also have to be addressed. Should changes in the disinfection equipment at either of the treatment plants occur, then further

permitting for management of hazardous materials, like chlorine, will be needed from the local fire department.

The City of Langley must also be consistent with the policies, requirements and regulations of Island County. For the planning and construction of collection facilities within unincorporated island County, the City must operate within the regulations established by Island County Code. Title 13 of the Island County Code, Public Works, and Title 15, Utilities, have been utilized for this report. Other portions of the Island County Code, such as road standards and franchise agreements, may apply as planning and construction of the projects identified in this Plan proceed.

1.6.4 County Requirements

As stated in the City of Langley's 2013 Comprehensive Plan, planning documents must also comply with the Island County Comprehensive Plan Development Concept. Island County adopted a Growth Management Act Comprehensive Plan in September 1998. Consistent with GMA requirements, the plan designated the three cities/town in the County as Urban Growth Areas. Originally, the City proposed to the County a UGA that was slightly larger than the city limits in order to have the land area necessary to accommodate the growth anticipated for the city. The UGA was eventually adopted by the County. In addition, an area of potential future growth expansion was identified outside the UGA. This area is known as the JPA, discussed previously. Subsequent to the County adoption of the comprehensive plan and development regulations to implement the plan, the City and County worked jointly on preparation of an interlocal agreement that was to establish and implement policies and procedures governing annexation by the city and subsequent development of properties in the unincorporated portion of the UGA.

The interlocal agreement was adopted in June 1999. In November 1999, the County adopted the UGA-Langley zone district and the associated land use regulations. In February 2001, the County adopted modified UGA and JPA boundaries as recommended by the City. During the development of this plan, discussions between the County and the city have occurred resulting in reducing the UGA to the current City Limits.

1.7 RELATIONSHIPS WITH OTHER UTILITIES

The City does not currently have any relationship with other water, storm or sewer utilities. The City, however, does have current relationships with Whidbey Telcom, Comcast, Puget Sound Energy, and Island Disposal, for telephone, cable television, power utilities, and solid waste, respectively.

1.8 RELATED PLANNING STUDIES

Recent planning and engineering studies which have been considered in the development of this Plan are listed below. These documents were used to insure consistency with existing regional and local planning efforts and previous studies performed on the sanitary sewer collection and wastewater treatment plant.

- City of Langley Comprehensive Plan, 2013, City of Langley
- City of Langley Comprehensive Sewer System Plan, 2006, URS

- City of Langley Shoreline Master Program, 2013, City of Langley
- Island County Comprehensive Plan, Updated 2011, Island County Department of Planning and Community Development

Chapter 2:
General Planning Data

This chapter includes discussions of land use (existing and future) and demographics (existing and projected population). In addition, descriptions of existing water supply wells in the system vicinity, drainage basins in the planning area, critical areas, and other pertinent physical geographic data are discussed. Also included are sections on service area policies and compliance or consistency with related planning documents.

2.1 PLANNING AREA

As described in the City's Comprehensive Plan, the Urban Growth Area (UGA) represents the community's historical approach to long range planning. A key function of the UGA is to limit urbanization to areas that are adequately supported by an urban level of transportation and utility infrastructure. In addition, establishment of the UGA defines the area that are to be preserved for agricultural and natural resource lands. Since the Comprehensive Plan and the previous sanitary sewer system plan, Island County and participating cities have identified a strategy for containing growth by reducing the UGA to match the current (2015) 650 acre Langley City Limits, with exception for a portion on the western side of the City north of the Wastewater Treatment Plant, where the treatment plant outfall pipe and forcemain run through the parcels. The public process for changing the UGA was underway by Island County during the process of developing the Plan. As such, wastewater flow projections address both the current City Limits and the previous UGA to both demonstrate the focus of this Plan and provide flexibility in planning for areas adjacent to the current City Limits.

2.2 EXISTING SERVICE AREA

The service area includes approximately 650 acres of land within the current City of Langley City Limits. The previous UGA shown on Figure 2-1, was used for previous sewer planning and includes approximately 450 acres surrounding the current City Limits. As noted above, population and flow projections have been developed for both the City Limits and the previous UGA to accommodate the UGA change underway in 2015. The sewer system serves about 60% of the population and essentially all of the businesses, the middle school, and the fairgrounds. Currently, no properties outside the City are served by the existing sanitary sewer system.

The existing sewer service area, is generally bounded by Saratoga Passage (on the north), DeBruyn Avenue, Park Avenue, and Anderson Road (on the west), Sixth Street and the southern end of the Northview Subdivision (on the south), and the east end of the Noble Cliff Subdivision (on the east).

2.2.1 Service Area Conflicts

Currently, there are no sewer service area conflicts since there are no adjacent sewer utilities. The service area was established in a coordinated effort with Island County in order to ensure that no service area conflicts would develop.

2.3 SEWER BASIN DESCRIPTIONS

The entire service area is divided into three sanitary sewer drainage basins. Sewer basins are established based on topography, logical sanitary sewer service areas and area boundaries (i.e., City Limits, previous UGA, and parcel lines). Sewer basins have been labeled with the prefix "C" for central, "E" for east and "W" for west and generally follow the natural drainage areas - the three streams running through the City. The sewer basins are shown in Figure 4-1.

2.4 ADJACENT WASTEWATER TREATMENT FACILITIES

The City of Langley operates the only public wastewater treatment facility in the vicinity of the service area. As noted above, approximately 60% of the City is served by the sewer system and the rest is served by on-site septic systems. Septage pumped from on-site facilities is received and treated by Island County or other facilities in the area. The closest municipal wastewater treatment facility is located at Coupeville, approximately 30 miles north of Langley.

2.5 COMPLIANCE WITH RELATED PLANNING DOCUMENTS

State standards for sewer plans require the location of water system facilities be shown on a map. The City of Langley maintains a Group A Water System authorized by the Washington State Department of Health under DOH Water System Identification Number 45950. The City relies on two aquifers as its main source of drinking water and operates the following facilities.

Reservoir

- Location: 949 Fairgrounds Road
  Volume: 618,179 gallons
  Overflow: HGL – 263.5 ft.

Wells:

- Well 1 - 500 gpm @ 281 depth; Well 3 - 90 gpm @ 42 feet; Well #6 - 75 gpm @ 51 feet
  Location: 818 Dalton Lane
- Well #5 – 250 gpm @ 300 feet (Emergency Only)
  Location: 999 Coles Road

Booster Pump Station

- Location: 949 Fairgrounds Road
  (2) 3 HP Domestic Pump; (3) 7.5 HP Fire Flow Pumps
- Location: 1002 Cedars Circle Sandy Point Road
  (3) 7.5 HP Domestic and Fire Flow Pumps

Countywide planning policies and demographic projections have also been used to develop future growth scenarios consistent with other local agencies.

2.5.1 City of Langley Comprehensive Plan Policies

This plan incorporates data from the City's Comprehensive Plan Land Use Element. To this end, the sewer plan is consistent with the City's current Comprehensive Plan and the elements that address sewer service in the City. This section summarizes the elements and policies that are included in the City's comprehensive plan that relate to sewer service.

The Land Use Element includes policies specific to sewer facilities that have been developed. The following policies related to sewer service.

- Policy 6.2 - Persons who develop land within the Urban Growth Area should be financially responsible for both on-site and off-site improvements required because of the development. These improvements may include, but are not limited to, street improvements, installation of traffic safety features, utility construction, utility capacity expansion, drainage ways, paths and/or sidewalks, easements, and parks and recreation areas as identified in the City's Capital Improvement Program. Consideration should be given to use of impact fees as a means for new development to pay its share of the costs of new or expanded facilities and services.

- Policy 6.4 - Extend City water and sewer utility services, except where alternatives to sewer services are deemed acceptable, to serve all of the residents of the City and to development within the Langley UGA in conjunction with annexation or recording of an annexation /development agreement (if not contiguous to the city limits and not eligible for annexation).

The Capital Facilities Element includes policies specific to sewer facilities that have been developed in accordance with Section 36.70A.070 of the Growth Management Act to address the capital facility's needs, in the City of Langley Urban Growth Area.

- Policy 1.B.1 - City sewer and water connection fee revenues shall be allocated primarily for capital improvements related to expansion.

- Policy 1.B.2 - The City shall require new development to pay for the costs of improvement that are necessitated by the project or proportional to the project's impact. The City may at its discretion participate in funding infrastructure for projects that serve the public interest.

- Policy 1.D.1 - The City and/or developers shall provide for the availability of public facilities and services needed to support development concurrent with the impacts of such development subsequent to the adoption of the Comprehensive Plan. These facilities shall meet adopted Level of Service standards and be consistent with the Concurrency Management System.

The Utilities Element of the comprehensive plan is intended to provide a link between land use planning policies of the City and the development activities of utility providers, and to describe how the various utilities plan to accommodate forecasted growth over the next 20 years. Utility element policies associated with the sewer system include:

- Policy 1.D - Utilities should be extended in an orderly manner, consistent with the financial capabilities of the City and applicants, the orderly development of the City, and the capacities of these systems.

- Policy 1.E - All new developments should be served by City water and sewer service and all existing development within two hundred feet of sewer main and capable of a side main connection should be connected to the City's sewer system. Allowance should be made in case of financial hardship.

- Policy 1.G - City water and sewer services should not be extended outside the City Urban Growth Boundary and into the Joint Planning Area until the City Comprehensive Plan has been amended pursuant to the State Growth Management Act to expand the UGA boundary and annexation has occurred or a pre-annexation agreement has been executed. The one exception is for direct water hookups outside the UGA area where there are existing service mains.
- Policy 3.G - Provide information needed by public, quasi-public and private utilities to identify and plan for future service development.
- Policy 3.H - Encourage system design practices intended to minimize the number and duration of interruptions to customer service.
- Policy 3.I - Ensure that the goals, objectives, and policies of this plan and the implementing development regulations are consistent with the public service obligations imposed by federal and state laws on utility service agencies.

2.6 ENVIRONMENTALLY SENSITIVE AREAS

Consideration of sensitive areas is an important element in identifying developable area and locating potential future sewer facilities. The City of Langley has adopted a Critical Areas Ordinance to protect environmentally sensitive areas such as: wetlands, frequently flooded areas, fish and wildlife habitats, geologic hazard areas, and aquifer recharge areas. Several planning goals to protect environmentally sensitive areas from encroachment or development are noted in the City's 2013 Comprehensive Plan. Three creeks flow through Langley: Saratoga Creek, Brookhaven Creek and Noble Creek and Langley's Shoreline Master Program (May 2013) has been adopted and implemented to meet the Washington State Shoreline Management Act requirements (RCW 90.58). The purpose of the Shoreline Master Program is to prevent harm to shorelines by regulating development and providing for appropriate shoreline uses and protection.

2.7 CLIMATE

The south end of Whidbey Island has cool, dry summers and mild, cloudy and rainy winters. Severe winter storms are generally prevented from moving into the area by the Olympic Mountains. The combination of rainy winters, mild temperatures, and long growing seasons is conducive to lush vegetation. The result is many evergreen forests with thick undergrowth. There is a prevailing wind from the north in Saratoga Passage on most afternoons in the summer.

The mean maximum and minimum temperatures in January are 45°F and 33°F, respectively. The mean maximum and minimum temperatures in July are 72°F and 52°F, respectively. The average length of growing season is 180 days. The mean annual precipitation (approximately 30-year average) is about 35 inches/year.

2.8 TOPOGRAPHY

The City of Langley is situated in a bowl-shaped depression on the eastern shore of south Whidbey Island. The business district is located at the base of the bowl, parallel to the 50- foot high bluff that overlooks Saratoga passage. The bluff is protected in places by a seawall while unprotected areas of the bluff remain more vulnerable to erosion. Two smaller drainage basins lie on the east end of Langley, and also slope toward Saratoga Passage. The topography ranges from sea level along Wharf

Street to approximately 250 feet above sea level at the City's southern boundary. The topography is shown in Figure X-1 (see Figures section).

Due to topographical restraints, some areas of the City cannot be developed. For example, steep slopes (in excess of 15%) are generally unstable in nature and are therefore, either costly to develop, or not suitable for development.

2.9 SOILS

The soils of Island County originated largely from glacial drift. This was deposited in moraines left by glaciers that once moved over the Puget Sound area from the north. The drift consists of sand, gravel, and clay which vary by texture, permeability, and consistency. There are two main types of soils in the Langley area, Keystone loamy sand and Norma silt loam.

The Norma silt loam soils occur in depression areas or basins that receive considerable seepage and runoff from surrounding uplands. These soils drain poorly in part due to a gravelly till layer that exists at a depth of about three feet. This material is moderately compact or weakly cemented and restricts the penetration of water. The water table of these soils is high and during the winter rainy season is usually at, or near, the surface. This type of soil is inappropriate for septic systems.

The other type of soil present in the drainage area is Keystone loamy sand. This is a glacial upland soil with 0-15% slopes. This soil developed from sandy drift and is relatively free of gravel. Because of the soil's open porous texture, water is absorbed readily and drains very rapidly.

2.10 LAND USE

2.10.1 Existing Land Use

The land use information used in this plan is summarized from the City's 2013 Comprehensive (Land Use) Plan, which conforms to Island County's Comprehensive Plan and the Growth Management Act (GMA) planning requirements. The GMA mandates concentration of population within designated Urban Growth Areas.

The City of Langley's existing zoning is shown in Figure 2-1. Land use within the UGA is generally characterized by a concentration of development in the downtown and immediately surrounding area and lower density development in the outlying areas. The exceptions in the outlying areas are near the shorelines, both immediately west and farther east of Langley. These areas are more densely populated which is typical of waterfront areas on Whidbey Island.

Table 2-1 shows the breakdown of acreage for each land use within the City Limits, UGA, and the JPA. Information in Table 2-1 was included in the City's 2013 Comprehensive Plan (Table LU-6).

2.10.2 Future Land Use

Future land use, as put forth in the 2013 Comprehensive Land Use Plan, is shown on Figure 2-2. Approximately one-half of the acreage in the Langley UGA is vacant or underdeveloped (Comprehensive Plan 2013). The available land area could accommodate additional development subject to sewer service and critical area constraints. The rural areas outside the UGA are intended to remain rural through the foreseeable future.

Table 2-1: Land Status by Zoning Classification

Land Use Classification	2013 Acreage			
	Developed	Under-developed	Vacant	Total
Residential High Density (RS 5,000)	16.07	0	1.27	17.34
Residential Med Density (RS 7,200)	99.02	52.99	41.72	193.73
Residential Low Density (RS 15,000)	87.75	46.03	52.23	186.01
Mixed Residential (RM)	21.51	0	0.73	22.24
Commercial Central Business (CB)	14.09	0	1.36	15.45
Neighborhood Business (NB)	9.13	1.26	6.10	16.49
Public Use (P-1)	102.56	N/A	N/A	102.56
TOTALS	**350.13**	**100.28**	**103.41**	**553.82***

Notes:
** Totals are less than the 650-acre total for land inside the current City Limits because the area within rights of way and private streets is not included in calculating the land-use inventory.*

2.11 DEMOGRAPHICS

2.11.1 Existing Population

The 2010 population for the City of Langley is estimated at 1,035 based on 2011 Office of Financial Management (OFM) and 2010 Census data. This is an increase of only 0.5 percent from the 2004 population estimate of 1,030. The population in Langley currently makes up about 1.3% of the total population in Island County.

2.11.2 Projected Population

Projected population and employment, as put forth in the City's 2013 Comprehensive Plan is shown in Table 2-2.

In accordance with the State GMA, the State OFM has published three ranges of population projections for each county: high, medium, and low. Growth calculations for Langley within the city limits are based on a percentage of the total County population projections. For the purpose of this plan, projections are based on the medium trend of 0.59 percent annual growth rates.

2.11.3 Existing and Projected Employment

The 2010 employment estimate for the City of Langley was 803, derived from 2008-2012 ACS American Community Survey data. Applying the medium growth trend of 0.59 percent/year, the 2014 employment estimate is 813. Further projections for the planning year values are provided in Table 2-2.

Table 2-2: Population & Employment Projections

Year	Population within City Limits	Population with UGA	Employment [c]
2010	1,035[a]	92[b]	803[b]
2014	1,059	94	813
2024	1,122	100	861
2034	1,188	106	912

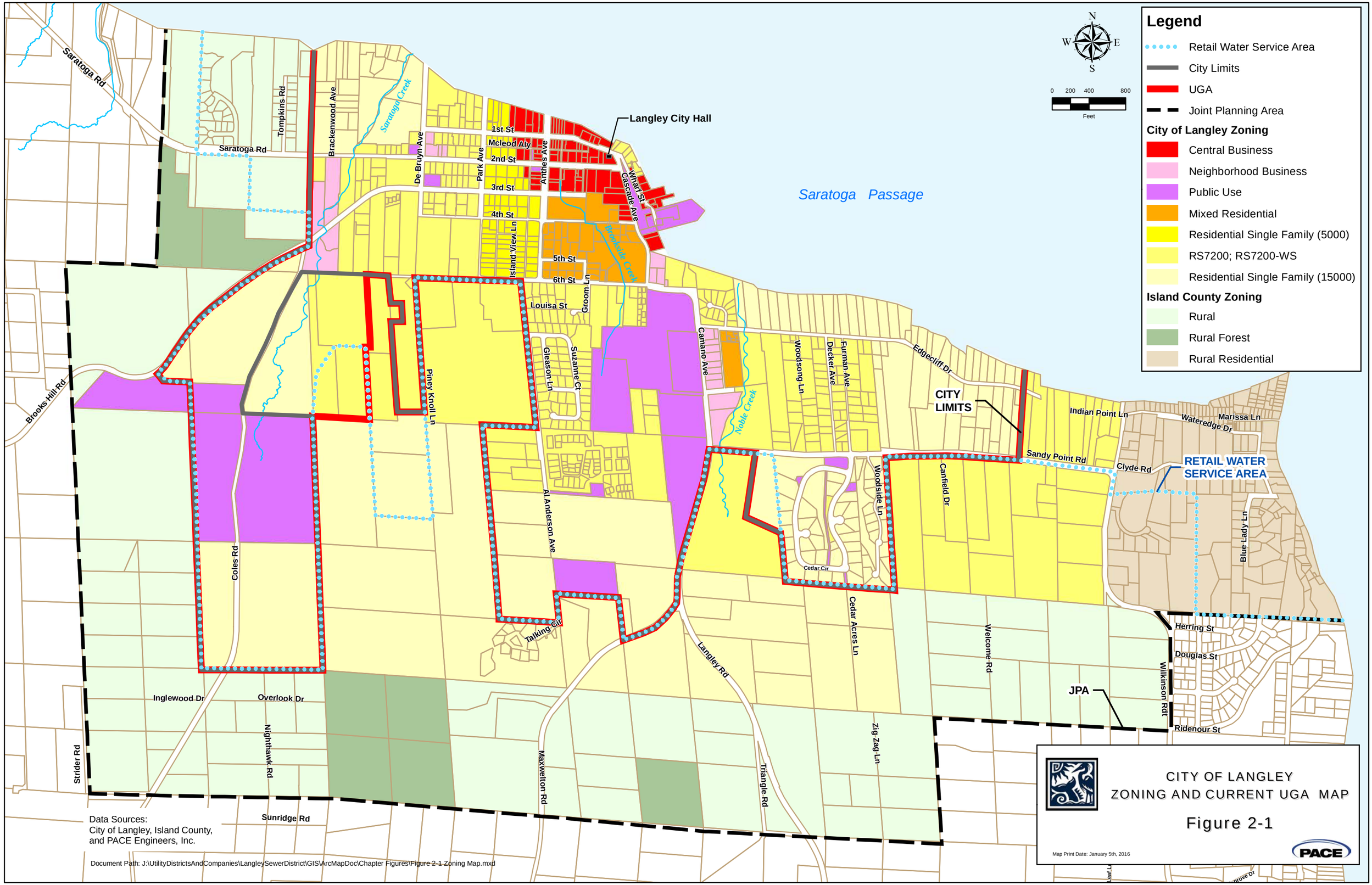
Notes:

[a] Source: City of Langley 2013 Comprehensive Plan, State Office of Financial Management Projections, 2010 Census Data.

[b] 2008-2012 ACS American Community Survey data

[c] All employment is estimated to be within City Limits

**Growth is calculated using Island County's Medium Growth Rate of 0.59 percent annually*


Legend
Retail Water Service Area
City Limits
UGA
Joint Planning Area
City of Langley Zoning
Central Business
Neighborhood Business
Public Use
Mixed Residential
Residential Single Family (5000)
RS7200; RS7200-WS
Residential Single Family (15000)
Island County Zoning
Rural
Rural Forest
Rural Residential
N
W
E
S
0 200 400 800
Feet
Saratoga Passage
Langley City Hall
CITY LIMITS
JPA
RETAIL WATER SERVICE AREA
Saratoga Rd
Tompkins Rd
Brackenwood Ave
Saratoga Creek
De Bruyn Ave
Park Ave
Anthes Ave
Cascade Ave
Wharf St
1st St
Mcleod Aly
2nd St
3rd St
4th St
5th St
6th St
Island View Ln
Wrenkside Creek
Louisa St
Groom Ln
Gleason Ln
Suzanne Ct
Piney Knoll Ln
Camano Ave
Noble Creek
Woodsong Ln
Decker Ave
Furman Ave
Edgecliff Dr
Indian Point Ln
Wateredge Dr
Marissa Ln
Sandy Point Rd
Clyde Rd
Blue Lady Ln
Woodside Ln
Canfield Dr
Cedar Cir
Cedar Acres Ln
Welcome Rd
Herring St
Douglas St
Wilkinson Rdt
Ridenour St
Zig Zag Ln
Triangle Rd
Langley Rd
Al Anderson Ave
Talking Cir
Brooks Hill Rd
Coles Rd
Inglewood Dr
Overlook Dr
Nighthawk Rd
Strider Rd
Maxwelton Rd
Sunridge Rd
Data Sources:
City of Langley, Island County,
and PACE Engineers, Inc.
Document Path: J:\UtilityDistrictsAndCompanies\LangleySewerDistrict\GIS\ArcMapDoc\Chapter Figures\Figure 2-1 Zoning Map.mxd
CITY OF LANGLEY
ZONING AND CURRENT UGA MAP
Figure 2-1
Map Print Date: January 5th, 2016
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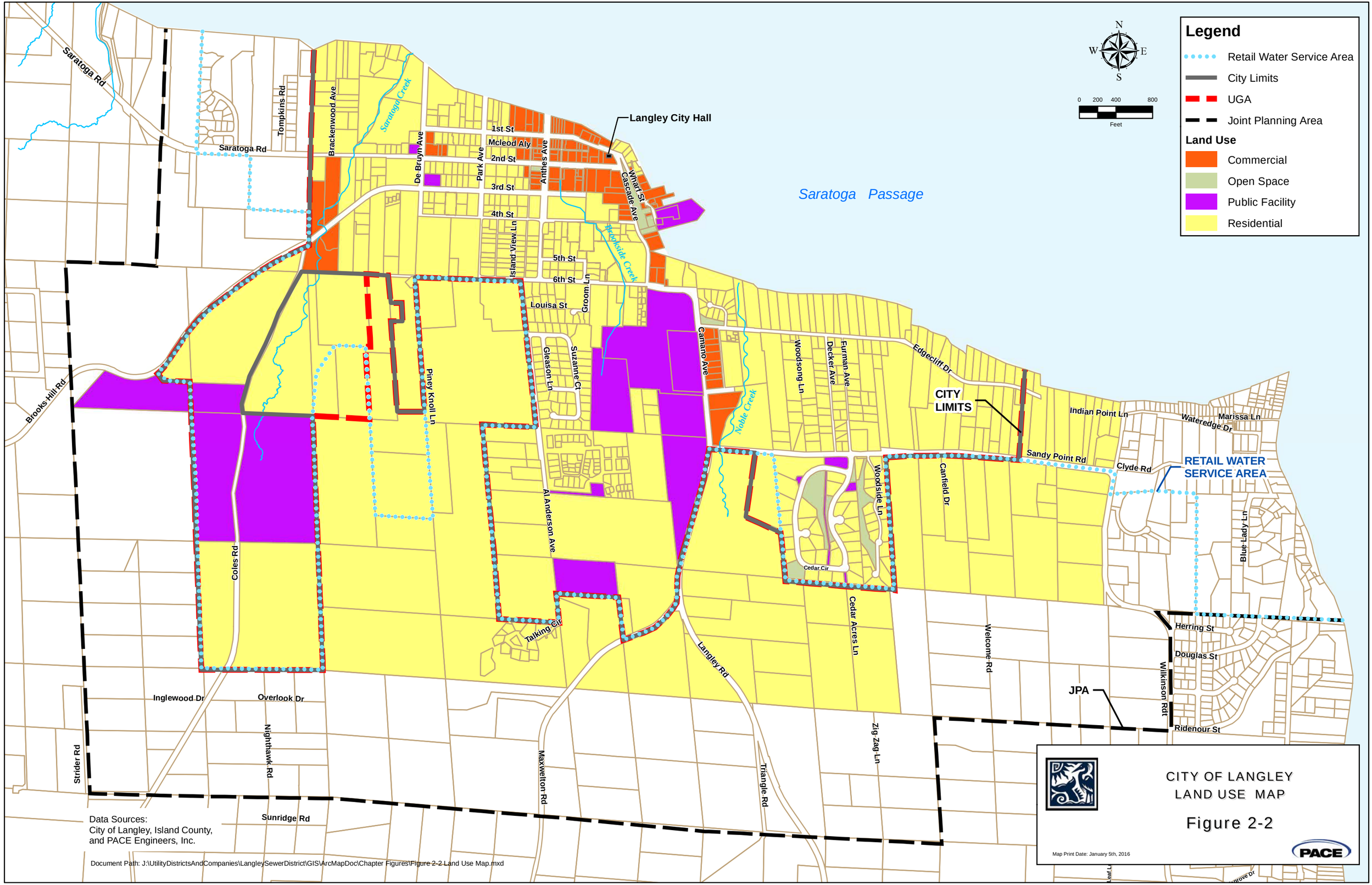
Legend
Retail Water Service Area
City Limits
UGA
Joint Planning Area
Land Use
Commercial
Open Space
Public Facility
Residential
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0 200 400 800
Feet
Saratoga Passage
Langley City Hall
CITY LIMITS
JPA
RETAIL WATER SERVICE AREA
Saratoga Rd
Tompkins Rd
Brackenwood Ave
Saratoga Creek
De Bruyn Ave
Park Ave
Anthes Ave
Wharf St
Cascade Ave
1st St
Mcleod Aly
2nd St
3rd St
4th St
Island View Ln
Brookside Creek
5th St
6th St
Groom Ln
Louisa St
Camano Ave
Noble Creek
Woodsong Ln
Decker Ave
Furman Ave
Edgecliff Dr
Indian Point Ln
Wateredge Dr
Marissa Ln
Sandy Point Rd
Clyde Rd
Brooks Hill Rd
Piney Knoll Ln
Gleason Ln
Suzanne Ct
Al Anderson Ave
Woodside Ln
Cantield Dr
Cedar Cir
Cedar Acres Ln
Blue Lady Ln
Herring St
Douglas St
Wilkinson Rd
Ridenour St
Welcome Rd
Talking Cir
Langley Rd
Zig Zag Ln
Triangle Rd
Maxwelton Rd
Coles Rd
Inglewood Dr
Overlook Dr
Nighthawk Rd
Strider Rd
Sunridge Rd
Data Sources:
City of Langley, Island County,
and PACE Engineers, Inc.
Document Path: J:\UtilityDistrictsAndCompanies\LangleySewerDistrict\GIS\ArcMapDoc\Chapter Figures\Figure 2-2 Land Use Map.mxd
CITY OF LANGLEY
LAND USE MAP
Figure 2-2
Map Print Date: January 5th, 2016
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2.12 PROJECTED FLOW

Table 2-3 presents the flows per capita for single family and retail/commercial used in the flow projections for the system. These estimated average flows were derived from a combination of sources, including historical water use data, Department of Ecology Sewage Design Standards, and engineering experience.

Table 2-3: Estimated Flow per Capita

Land Use	Estimated Average Daily Flow
Single Family	75 gallons/capita/day
Retail / Commercial	35 gallons/employee/day

Notes:
Estimated flows do not include infiltration and inflow.
Estimated flows are based on the Ecology's Criteria for Sewage Works Design (August 2008).

Sanitary sewer flow projections are comprised of four separate components defined as follows:

Base Flows are a simple calculation of average flow rates without consideration of infiltration and inflow (I&I). Base flows have been determined by applying average flows per capita (as indicated in Table 2-3) to the population and employment data presented in Table 2-2.

Peak Flows are used to estimate domestic flows at peak periods (typically early morning and evenings) and do not take infiltration and inflow into account. A peaking factor of 4.0 has been applied to base flows to estimate the peak flows indicated in Table 2-4 and Table 2-5 (Base Flow x 4.0 = Peak Base Flow).

Infiltration and Inflow (I&I) is groundwater entering sanitary sewer through defective pipe joints, or broken pipes and water entering through inappropriate connections such as roof drains. I&I is calculated at a City-wide rate of 1,100 gallons per acre per day (gpad) assuming approximately 140 acres contribute to infiltration and Inflow into the system.

Total System Flows or peak flows plus I&I have been determined by adding the aforementioned I&I rate to the peak base flows. No peaking of I&I has been assumed.

The existing and projected flows shown in Tables 2-4 and 2-5 are provided for the Sanitary Sewer Service Area (City Limits) and 2013 UGA separately. At the time of the development of this Plan, no development within the UGA is served by the City's sewer service and therefore no flow is shown for 2014.

Table 2-4: Projected Flows within City Limits

Year	% Population Served [a]	Base Flow (gpd)	Peak Flow (gpd) [b]	Peak Flow (gpm)	I&I Flow (gpm) [c]	Total System Flows
2014	60%	76,100	304,400	211	110	321
2024	65%	84,800	339,200	236	120	356
2034	70%	94,290	377,160	262	130	392

Notes:
[a] At the time of the development of this plan, it is estimated at 60% of the population within the City Limits were served by sewer. The remaining 40% is on septic.
[b] A peaking factor of 4.0 is used for the City
[c] I&I is calculated using 1,100 gpad

Table 2-5: Projected Flows within Urban Growth Area

Year	% Population Served [a]	Base Flow (gpd)	Peak Flow (gpd) [b]	Peak Flow (gpm)	I&I Flow (gpm) [c]	Total System Flows
2014	0%	0	0	0	0	0
2024	2%	150	600	0.50	3.5	4.0
2034	5%	400	1,600	1.10	7.0	8.1

Notes:
[a] Growth rates in Urban Growth Area is estimated
[b] A peaking factor of 4.0 is used for the City
[c] I&I is calculated using 1,100 gpad

Chapter 3:
Service Area Policies & Design Criteria

This Chapter identifies sanitary sewer policies and minimum collection system design criteria for the purpose of analyzing the existing sewer system and planning future improvements. Minimum design criteria include capacity requirements for various system facilities, infiltration and inflow rates, and peaking factors to be utilized in design of improved or new facilities.

3.1 SERVICE AREA GOALS AND POLICIES

The overall objective of the City of Langley's sanitary sewer system operations is to provide high quality collection and treatment of wastewater that meets or exceeds all applicable State and Federal standards at a reasonable cost. The following goals and policies are inherent to operation of the sanitary sewer utility in a safe, reliable and cost effective manner:

- Provide a properly planned wastewater collection and treatment system that is safe, cost effective, environmentally sound, and adequately protects public health and welfare as well as the quality of ground water and surface water resources.
- Provide wastewater collection and treatment facilities consistent with the adopted land use plans and policies.
    - Consistent with Growth Management Act planning, public sanitary sewer service will be made available to all properties within the Urban Growth Area (UGA). This Plan acknowledges the UGA is to change in the near future.
    - Newly developing properties within the UGA will be required to connect to the sanitary sewer system, in accordance with City of Langley Municipal Code. These developments should be financially responsible for on-site and off-site improvements required because of the development.
- Provide and maintain facilities that are essential for the provision of continuous and uninterrupted service without backups, overflows or leakage.
- Provide sufficient capacity in the wastewater collection and treatment systems to accommodate the existing and projected wastewater flows.
- Require new connections to the system to comply with the City of Langley's LMC 15.01.165 – Connection to existing system.
- Provide wastewater collection and treatment services to new customers without interrupting or diminishing existing service levels.
- Maximize use of gravity trunks, mains and service connections. Alternative systems will only be allowed in specific instances where gravity service is determined not feasible by the City or the City's designated consulting engineer.
- Encourage residents within the service area that are currently utilizing on-site disposal systems to connect to the City's sewer system when appropriate.

- Provide wastewater treatment in a manner that is consistent with the Washington State Department of Ecology's policies for improving the quality of the Puget Sound's receiving waters.
- Perform capacity and Level of Service analyses and design future system improvements consistent with the Minimum Design Criteria established by the Washington State Department of Ecology.
- Update the Sewer Plan every six years on a rotating schedule with other capital facilities plans.

3.2 MINIMUM DESIGN REQUIREMENTS

The 2008 Criteria for Sewage Works Design Manual (Orange Book), as published by the Department of Ecology (Ecology), in cooperation with the State Department of Health (DOH) and the U.S. Environmental Protection Agency (EPA), sets forth guidelines, standards, and minimum requirements for sanitary sewer systems operating within the State of Washington. These guidelines, in conjunction with the City's minimum requirements set forth in Langley Municipal Code (LMC) 15.01.110 Sanitary Sewer Systems, establish the design criteria and construction standards to be used for extensions, upgrades and additions to the City of Langley's sanitary sewer system.

3.3 PERIOD OF DESIGN

In planning sewage facilities it is necessary to evaluate both present conditions and future service needs, and to design a system capable of meeting variable demands over a given length of time or period of design. Minimum design periods of 20 years for mechanical facilities and 50 years for collection facilities are recommended. The Ecology's design criteria, as put forth in the Criteria for Sewage Works Design Manual, recommends consideration of the following factors, which affect design periods for specific facilities:

- Laterals should be designed for the ultimate development of the parcel with current zoning or tributary areas to be served.
- The design period for trunk and interceptor sewers should be based on an evaluation of economic, functional, and other considerations, including:
    - Possible solids deposition, odor, and pipe corrosion that might occur at initial flows
    - Population and economic growth projections and the accuracy of the projections (generally for ultimate development)
    - Infiltration and inflow
    - Comparative costs of staggered construction alternatives
    - Effects of sewer sizing on land use and development
- Pump station design should be based on ultimate development under current zoning of the served and potentially served areas.

3.3.1 Planning

Initial system construction and additions should conform to the City of Langley Comprehensive Plan. The City Planning Advisory Board shall review all developments against comprehensive

plan land use, future growth for the neighboring area, and sewer capital improvement plans to determine if joint ventures can co-exist between the developer and the City.

3.4 GENERAL DESIGN CRITERIA

All sanitary sewer facilities are to be designed in accordance with good engineering practices to suit the actual conditions at the project location by a professional engineer approved by the City and licensed in the State of Washington. All pipelines are to be designed and constructed in accordance with Ecology's Criteria for Sewage Works Design Manual, the City Muncipal Code sewer extension policies, and the requirements identified in this Comprehensive Sewer Plan.

Sewer system facilities must be designed with sufficient capacity to carry peak flows from the tributary area at ultimate development unless other criteria has been established by the City. Sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and to minimize infiltration and inflow.

3.4.1 Reference Datum

Mapping and analyses for this Plan are based on Reference Datum NAVD 29.

3.4.2 Combined Sewers

Combined sanitary and storm sewers are NOT allowed within the City.

3.4.3 Overflows

No overflows or new overflow structures shall be permitted.

3.5 FLOW RATES

Flow in a sanitary sewer system is composed of domestic, commercial and industrial wastes, groundwater infiltration and surface water inflows. All portions of the sewer system must be capable of carrying the peak volumes from these sources. Table 3-1 identifies the estimated quantities of flow associated with various land uses within the City. The flows presented do not include infiltration and inflow. Analysis of flows associated with more specific land uses should be based on actual water consumption data and/or Ecology's criteria.

Table 3-1: Estimated Flow Rates
By Land Use

Land Use	Estimated Average Daily Flow
Single Family	75 gallons/capita/day
Multi Family	50 gallons/capita/day
Retail / Commercial	35 gallons/employee/day
Industrial	75 gallons/employee/day
Institutional	35 gallons/employee/day
Schools	10 to 16 gallons/person/day

Notes:
Estimated flows do not include infiltration and inflow.
Estimated flows are based on the Ecology's Criteria for Sewage Works Design (August 2008).

3.5.1 Peaking Factors

Sanitary sewers and associated collection facilities shall be designed to carry at least peak-hour flows. Table 3-2 provides a summary of typical peaking factors used in the analysis of sanitary sewer system collection facilities. More specific peaking factors put forth in Ecology's design criteria, which are based on ratio of peak hourly flow to design flow according to population, should be utilized in the actual design process of new system facilities.

Table 3-2: Peaking Factors

Type of Facility	Ecology Standard
Service Laterals and Local Sewers	4
Trunk and Interceptor Lines	3

Notes: Peaking factors indicate the multiplier to be used to determine peak flow.
Ecology peaking factors are based on a population of 10,000 for trunk sewers. Peak flow for alternative systems is defined as an event that lasts about 15 minutes where:
Q = Design Peak Flow in gpm
D = Number of equivalent dwellings
P = Population
Peaking Factors do not apply to infiltration and inflow.

3.5.2 Infiltration and Inflow

Infiltration is groundwater which enters sewers through pipe joints or porous pipe. Inflow is surface water which enters the sewer through manhole covers or illegal connections such as footing drains, roof drains and area drains.

Infiltration & Inflow (I&I) is expressed in units of gallons per acre per day (gpad). Although new sewers are constructed with materials and methods to eliminate I&I, some allowance must be made for the future deterioration of facilities and potential illegal connections. Typical values utilized for I&I in evaluation and/or design of sewer systems are 600 gpad for infiltration and 500 gpad for inflow, although these values may vary according to local conditions. For older sewers, values are determined on a case-by-case basis and verified by pump station and flow monitoring data. Historically, I&I rates for the City has been assumed at 1,100 gpad. Future planning should continue to use the I&I rate of 1,100 gpad for the gravity sewer system, but reduced to zero where alternative systems are used.

Alternative systems are not meant to receive high amounts of I&I. Methods and materials to be incorporated into the design will minimize sources of I&I from the system.

3.6 COLLECTION SYSTEMS

Collection facilities should be designed for the ultimate development of the tributary areas based on the design factors outlined in Tables 3-1 and 3-2 and anticipated I&I rates.

3.6.1 Gravity Sewers

Gravity sewers can be used if the area being served flows directly to the existing gravity system and is approved by the City of Langley. Gravity sewer designs should consider at least the following:

- Peak sewage flows from residential, commercial, and industrial sources

- Infiltration and inflow
- Topography and depth of excavation
- Treatment plant location
- Soil conditions
- Flow impacts from upstream pump station, if applicable
- Maintenance
- Existing sewers
- Existing and future surface improvements
- Controlling service connection elevations
- Flow from existing combined systems, if applicable
- Potential surcharge of downstream sewers
- Impact on alternative systems

Pump stations may be allowed at the sole discretion of the City, only after a thorough investigation has shown that no other cost-effective alternatives are available.

3.6.2 Laterals, Trunk and Interceptor Sewers

Lateral sewers must be designed with sufficient capacity to carry peak flows from the ultimate development of the tributary area based on criteria established previously in Tables 3-1 and 3-2.

Selections of the design period for trunks and lateral sewers should be based on an evaluation of economic, functional and other considerations such as:

- Possible solids deposition, odor and pipe corrosion that may occur at initial flows
- Population and economic growth projections
- Comparative costs of staged construction alternatives

3.6.3 Side Sewers (Laterals)

All side sewers shall be a minimum of 6 inches in diameter to the property line. For single family residences, a minimum 4 inch in diameter side sewer may be connected from the property line to the single-family residence. If more than one residence is to be connected to the side sewer, the minimum size for side sewers shall be 6 inches in diameter.

Six-inch diameter lateral is required for all commercial or general business applications or for multifamily connections.

3.6.4 Alternative Systems

Where physical limitations make it impractical to otherwise serve an area, alternative systems may be appropriate. These systems must be approved by the City on a case by case basis and only when no other feasible and cost effective alternatives exist.

Alternative systems convey wastewater to a centralized location include grinder pump (GP), septic tank effluent pump (STEP), small-diameter gravity (SDG), and vacuum systems. GP systems use a machinating-type pump to convey sewage through a small-diameter pipe to a centralized location. STEP systems use an effluent-type pump to convey the liquid component from a septic tank-type vessel to the centralized location. The solids eventually need to be periodically removed from the STEP tank. The SDG system uses gravity to convey liquids from a septic tank-type vessel to a centralized location. The vacuum system works on differential air pressure, conveying the sewage from the collection sumps at the residents or places of business to the vacuum station where it is transferred to conventional sewage pumps for transport to a gravity manhole or treatment facility.

Should a GP system prove to be the exception to gravity sewer service, a semi-positive displacement grinder pump as manufactured by Environment One has been approved by the City and included in the City's standards.

Minimum pipe sizes and system configurations for alternative systems shall be calculated on a case-by-case basis to provide a minimum velocity of 2 feet per second.

3.7 PIPE SIZING

All gravity collection sewers shall be a minimum of 8 inches in diameter.

Outfall and force main pipe sizing shall be as hydraulically justified and approved by the City.

3.7.1 Minimum Velocity

All gravity sewers shall be designed and constructed to accommodate mean flow velocities of not less than 2.0 feet per second at average dry weather flows at 0.8 full flow.

3.7.2 Roughness Coefficient

An "n" value of 0.013 (with 0.8 full flow) shall be used in Manning's formula for the design of gravity sewer facilities, regardless of type of pipe.

3.7.3 Downsizing

Downsizing of sewer lines, or the installation of a smaller-diameter line downstream of a larger-diameter line, will not be allowed.

3.8 PIPE SLOPE

All gravity sewers shall be designed and constructed to accommodate mean flow velocities of not less than 2.0 feet per second at 0.8 full flow. Table 3-3 shows the minimum allowable slopes for gravity sewers for different pipe sizes. Slopes greater than those indicated are desired, particularly under low flow conditions.

Table 3-3: Minimum Slope Requirement

Sewer Main Size (inches)	Minimum Slope (feet per 100 feet)	Sewer Main Size (inches)	Minimum Slope (feet per 100 feet)
8	0.40	21	0.10
10	0.28	24	0.08
12	0.22	27	0.07
15	0.15	30	0.06
16	0.14	36	0.05
18	0.12		

Notes: Minimum requirements from Ecology's Criteria for Sewage Works Design (August 2008).

Oversizing sewers with respect to capacity in order to allow the use of flatter slopes should be avoided as this may result in operational capacities below sedimentation velocity of 2 fps for average dry weather flows.

Sanitary sewers are to be installed with uniform alignment and slope between manholes. Sewers with slopes greater than 15% must be anchored securely with concrete anchors or retaining gaskets. Sewers with slopes in excess of 40% or with a velocity greater than 15 fps at any structure shall be equipped with approved energy dissipaters. Any such devices shall be reviewed by the City on a case-by-case basis.

3.9 MATERIALS

Polyvinyl Chloride (PVC) ASTM D3034 SDR 35 pipe may be used for gravity sewer lines where soil foundation conditions permit and for slopes less than 15% and depths less than 20 feet. For alternative systems, pipelines shall be constructed of material that is not readily subject to corrosion by raw or septic wastewater and subject to City prior to approval.

Force mains for sizes up to 12 inches shall be ductile iron AWWA C151 Class 50 or PVC C900 with ductile iron fittings and gasketed joints. For 14- to 24-inch mains, pipe shall be ductile iron AWWA C151 Class 50 or PVC C905 with ductile iron fittings and gasketed joints. A more rigid pipe may be required where unlimited trench widths occur. All ductile iron pipe and fittings shall be epoxy coated or PE lined and designed for use with corrosive materials.

Ductile-iron pipe placed in peat soils or potentially corrosive areas shall be polyethylene-encased.

All rigid pipes must pass standard crushing, flexural and fill tests to ensure that the installation will be watertight and able to withstand earth loads after being placed in the trench. Sewer pipes shall be connected by flexible rubber-gasket-type joints, or other methods specifically approved by the City.

3.10 SEWER LOCATIONS

In general, lateral, trunk and interceptor sewers are to be located in existing street public rights-of-way or proposed street areas. Certain sewers, however, will need to be located within easements in order to utilize topography or to maintain continuity.

3.10.1 Depth

Minimum depth of cover for a gravity sewer line in street right-of-way is 8 feet. Minimum depth of cover for side sewers is 6 feet at the property line. When specifically approved by the City, shallower depths may be used if pipe crush strength analyses are provided; however, in no case shall the depth of cover be less than 36 inches.

3.10.2 Separation

A minimum horizontal separation of 10 feet, measured edge to edge, shall be maintained between gravity sanitary sewers and any existing potable water line wherever possible. Sewer lines crossing water lines are to be laid below the water lines to provide a separation of at least 18 inches between the invert of the water line and the crown of the sewer pipe. Where the required separation of water and sewer lines cannot be achieved, sewer lines are to be constructed as specified in the Ecology's Criteria for Sewage Works Design Manual. Cross connection control shall be done in accordance with State requirements and coordinated with the City.

3.10.3 Alignment

Gravity sewers shall be designed with straight alignment between manholes.

3.11 GRAVITY SYSTEM PUMP STATIONS

This section covers the design and construction of sewage pump stations and force mains and shall be consistent with the LMC 15.01.205 and LMC 15.01.225, respectively.

3.11.1 Location & Flood Protection

Sewage pump stations shall be located as far as practical from present or proposed residential areas, and an all-weather road shall be provided for access to all pump stations. Noise control, odor control, and station architectural design must be considered in the locating and design of sewage pump stations. Sites for pump stations must be of sufficient size to accommodate expansion of facilities to meet projected build-out conditions.

Operational components must be located at elevations above established 100-year flood/wave action or shall be adequately protected against such action. All pump stations must be designed to remain fully operational during 100-year flood conditions.

3.11.2 Pumping Rate & Number of Units

At least two pumps must be provided at each pump station and each must be capable of handling the anticipated maximum flow. Where three or more pumps are provided, they shall be designed to fit actual flow conditions and must be of such capacity to handle anticipated maximum flow with the largest pump out of service.

3.11.3 Pump Cycle Ratios

Pump station peaking factors of 4.0 are used to derive peak flows from average day flows. Pump cycle ratios must be appropriate to provide a margin of safety against pump overheating and subsequent wet well flooding should mechanical problems occur at or near peak flow conditions.

3.11.4 Pumps

Pumps shall be capable of passing spheres of at least 3 inches in diameter. Pump suction and discharge openings shall be at least 4 inches in diameter. Pumps shall be placed so that they will operate under a positive suction head under normal operating conditions (unless otherwise approved).

3.11.5 Wet Well Sizing

The sizing of any wet well shall conform to City standards and the Department of Ecology's "Criteria of Sewage Works Design"

Sewage pump station wet wells should be designed to provide acceptable pump intake conditions, adequate volume to prevent excessive pump cycling, and sufficient depth for pump control, while minimizing solids deposition.

For constant speed pumps, the minimum volume between pump on and off levels can be calculated using the following general formula:

V = tQ/4, where
    V = minimum volume (gallons)
    t = minimum time between pump starts
Q = pump capacity (gallons/minute)

3.11.6 Controls

The method of pump station control shall be submitted to the City for approval at the time of design. Provisions shall be made to automatically alternate pumps in use. Pump stations with motors and/or controls below grade shall be equipped with a secure external disconnect switch. All new pump stations shall be designed with the capability of measuring both pump run times and actual wastewater flow.

3.11.7 Site Water

Water service with a required backflow prevention device is required at each pump station.

3.11.8 Emergency Power

On-site or portable power units shall be incorporated into station design. Permanent standby power is required.

3.11.9 Alarm System and Telemetry

An alarm system to monitor the following is a minimum for all City-owned and operated sewage pump stations:

- Intrusion
- Power failure
- Wet dry well
- High wet well
- Low wet well

- Smoke
- Operator in trouble
- Pump failure
- Line failure

Test circuits should be provided to enable the alarm system to be tested and verified it is in good working order. All new telemetry must be compatible with the City's current system.

3.12 MANHOLES

Manholes are to be installed at the end of each line 8 inches in diameter or greater. Manholes shall also be installed at all changes in grade, size, or alignment, at all intersections, and at distances not greater than 400 feet for sewers unless otherwise approved by the City.

The minimum diameter of manholes is 48 inches. The minimum clear entrance opening in manholes shall be 24 inches. Larger-size manholes may be required to accommodate special requirements.

Outside drop connections are only allowed in new construction if specifically approved by the City. Inside drop connections may only be allowed if the connection is to an existing manhole greater than 12 feet in depth.

Flow channels in manholes shall be of shape and slope to provide smooth transition between inlet and outlet pipes and to minimize turbulence. The channeling height shall be to the crown of the sewer main. Benches shall be sloped from the manhole walls toward the channel to prevent solids accumulation. All manholes shall be watertight Connections shall be made with flexible joints, which allow the manhole to settle without destroying the watertight integrity of the connection.

3.13 CROSS CONNECTION CONTROL

Protection of public water supplies is an important aspect in the design of sewer facilities. There shall be no physical connection between a public or private potable water supply system and a sanitary sewer system, or appurtenance thereto, which would permit the passage of cross connection with the potable water supply system.

Chapter 4:
Existing System & Analysis

This chapter summarizes the City's existing sewer system infrastructure and capacity and evaluates the effects of future growth. The existing sewer system is shown in Figure 4-1 at the end of this chapter. As of December 2014, the sewer system had a total of approximately 450 sewer billing accounts. Of the 450 accounts, 111 are commercial, 4 are public facility, 37 are multifamily and 298 are residential. The system is comprised of three drainage basins, 6.87 miles of pipe, three pump stations, and a 0.15 MGD wastewater treatment plant. Currently, most flows of the system discharge into Pump Station No. 1 which pumps to Pump Station No. 2. In addition to the flow from Pump Station No. 1, Pump Station No. 2 receives a minor amount of sewer flow directly into its wet well. All the flow from Pump Station No. 2 is pumped to the Wastewater Treatment Plant (WWTP). The treated effluent is discharged through approximately 7,200 feet of pipe into the waters of Puget Sound's Saratoga Passage.

4.1 SEWER BASIN DESCRIPTIONS

The City of Langley sanitary sewer area is comprised of three sanitary sewer drainage basins. Sewer basins were established based on topography, logical sanitary sewer service areas and area boundaries (i.e., City Limits, Urban Growth Area UGA, and parcel lines). Sewer basins have been labeled with the prefix "C" for Central, "E" for East and "W" for West and generally follow the natural drainage areas of the three streams that run through the City.

At the time of development of this Plan, only one area - the Woodside development was provided sewer service outside of the Central Basin. The development is located in the East Basin and sewer is pumped over a hill through a 3 inch forcemain. It is anticipated that gravity sewer will be extended in the future to serve this development and surrounding areas.

As development proposals are made in the West and East basins, evaluation of cost effective methods to deliver sewage from these basins to the wastewater treatment plant will be required.

4.2 PROJECTED WASTEWATER FLOWS

Projected wastewater flows were evaluated in Chapter 2 – General Planning Data, and used to analyze the system and its capacity. These are summarized in the Table 4-1. The flows were estimated by using population and employment data to develop the projected flows.

Municipal wastewater consists of basic sanitary flow, groundwater infiltration and surface water inflow, all of which are included in the flow analysis. Per capita flow rates, as presented in Table 3-1, were used to evaluate residential and employment flows into the system.

Table 4-1: Projected Wastewater Flows	
Year	System Flows (mgd) [a]
2014	0.076
2024	0.085
2034	0.095
Notes: [a] *No peaking factor is applied*	

4.3 EXISTING COLLECTION SYSTEM & ANALYSIS

The purpose of this section is evaluate the City's existing collection system facilities and analyze its capacity with regard to current sewage flows and anticipated flows. Modeling has not been performed based on a limited number (450) of connections and the fact that key pipes have sufficient capacity.

4.3.1 Existing Pipe Inventory

The existing sewer collection system has approximately 6.87 miles of sewer piping with diameters ranging from 2 inch to 4 inch for grinder pump (GP) mains and from 6 inch to 12 inch pipe for gravity sewers. A summary of the length and of the various sizes of sewer is shown in Table 4-2.

Table 4-2: Existing System Sewer Pipe Inventory		
Pipe Diameter (inches)	Approximate Length (feet)	Approximate Length (miles)
2" GP Lines	1,662	0.31
3" GP Lines	2,900	0.55
3" FM Lines	920	0.17
4" GP Lines	3,140	0.59
4" FM Lines	1,550	0.29
6" Gravity Pipe	2,115	0.40
8" Gravity Pipe	20,750	3.93
10" Gravity Pipe	2,700	0.51
12" Gravity Pipe	520	0.10
TOTAL	**36,257**	**6.87**

Since the 2006 Sewer Plan, the following additions and betterments to the system have been completed.

- St Hubert Church, constructed in 2006, included approximately 378 feet of 3 inch and 50 feet of 4 inch low pressure sewer.
- Woodside, located on Sandy Point Road, was constructed in 2007 and included approximately 1,480 feet of 8 inch gravity sewer (685 within right of way of Sandy Point

Road) and 1,250 feet of 3 inch low pressure sewer (950 feet within right of way of Sandy Point Road).

- 3rd Street Sewer Extension, constructed in 2007, included approximately 1,000 feet of 3 inch and 337 feet of 2 inch low pressure sewer.
- Langley Garden Bungalows, constructed in 2008, included approximately 345 feet of 8 inch gravity sewer.
- Highlands at Langley, constructed in 2008, included approximately 1,362 feet of 2 inch, 712 feet of 3 inch, and 1,050 feet of 4 inch low pressure sewer.
- Langley Road sewer extension, located at the intersection of Langley Road and Sandy Point Road and extending south was constructed in 2008 and included approximately 1,400 feet of 4 inch low pressure sewer.
- Upper Langley development is currently in the final stages of the permitting process and includes 647 feet of 8 inch gravity sewer and 565 feet of low pressure sewer.
- The Gignac Sewer Extension, constructed in 2010, included approximately 180 feet of 4 inch low pressure sewer.

4.3.2 Capacity Analysis

Sewer capacity was analyzed for the 12 inch gravity collection main that enters into Pump Station No. 1. The 12 inch gravity main in this area has a slope that ranges from 1.5% to 16%. The 12 inch main is located within Anthes Avenue and runs from the intersection at Second Street to the waterfront where the Pump Station No. 1 is located. The capacity for this 12 inch main at this location is 2,000 gpm for the smaller slopes and in the area of larger slopes could accommodate approximately 6,500 gpm. This capacity far exceeds the potential build out of the entire system.

4.3.3 Existing Pump Stations

Currently there are three City-owned wastewater pump stations in the system. The Sunrise Beach Pump Station is located at the base of Wharf Street. Pump Station No. 1 is located at Seawall Park (site of the former wastewater treatment facility). Pump Station No. 2 is located at the corner of Second Street and DeBruyn Avenue. The general location of each pump station is shown in Figure 4-1, Existing Sewer System.

Each pump station is equipped with at least two pumps of equal capacity that are operated alternately with one pump serving as a standby. Table 4-3 lists the capacity and horsepower ratings of each station.

Table 4-3: Existing Pump Station Data					
Pump Station Name	Number of Pumps	Pump Capacity (gpm)*	Force Main Diameter (inches)	Standby Power	Emergency Bypass
Sunrise Beach	2	230 @ 30' TDH	4	Generator Connection	Yes
1	2	500 @ 130' TDH	8	In-Place Generator	No
2	2	500 @ 87' TDH	8	In-Place Generator	No
Notes: *TDH = Total dynamic head*					

The most recent modification was to the pump at Pump Station No. 1 where it was upgraded to 500 gpm capacity at 130 feet TDH (Total Dynamic Head).

Permanent generators were installed at Pump Stations No. 1 and No. 2 in case of power failure, while the Sunrise Beach Pump Station has a generator plug-in for use with a portable unit.

All of the pump stations are wet well types with submersible pumps. Except for the locked control panels that are mounted above ground, these facilities are located below ground.

One private pump station installed as part of the Woodside Subdivision is located along Sandy Point Road. This pump station, is intended to be an interim station once gravity sewer is extended up Furman Avenue. The City of Langley has taken on the maintenance and operation of this station. The pump station consists of two submersible 3 HP grinder pumps in a manhole.

4.3.4 Pump Stations Analysis

DOE requires that pump stations have at least two pumps capable of handling peak flow. The current capacities of Pump Stations No. 1 and No. 2 are 500 gpm each.

Tables 4-4 show the capacity analysis of Pump Station Numbers 1 and 2 using projected population values. Flows typical of gravity systems were used in these tables. These values give worst-case peak flows for each pump station.

It is anticipated that upgrades to the pump stations will need to occur at the end of the planning period. The recent upgrades of the pump stations will suffice for the short and near term of the planning period.

Table 4-4: Pump Station Capacity Analysis						
Year	Peak Flow (gpd) [a]	Peak Flow (gpm) [a]	I&I Flow (gpm) [b]	Total System Flows	Design Capacity (gpm)	Surplus / Deficit (gpm)
2014	304,520	211	110	321	500	179
2024	340,000	237	124	361	500	139
2034	378,750	263	137	400	500	100

Notes:
[a] A peaking factor of 4.0 is used for the City
[b] I&I is calculated using 1,100 gpad

The pump station analysis considers the population growth data that was presented in Table 2-2 of this plan. Currently, wastewater flows from the Central and East basin flow to Pump Station No. 1 and is pumped to Pump Station No. 2. The analysis shows that Pump Station No. 1 and No. 2, with the 500 gpm pump upgrade, can likely support projected growth through year 2034 and beyond.

4.3.4.1 Identified Pump Station Deficiencies

The pumps, telemetry, ventilation, and electrical controls at the Sunrise Beach Pump Station have needed upgrading since the 2006 Plan. The wet well structure meets the standards and will not require upgrades.

4.3.5 Existing Force Mains

The collection system includes several force mains. Approximately 1,600 feet of 4-inch force main carries flow from the Sunrise Beach Pump Station to Pump Station No. 1. From Pump Station No. 1, approximately 1,860 feet of 8-inch force main is used to convey sewage to Pump Station No. 2. Approximately 4,350 feet of 8-inch force main carries flow from Pump Station No. 2 to the WWTP. The force main from Pump Station No. 2 to the WWTP is parallel to the effluent outfall. A force main is also located along Sandy Point Road to convey flows from the Woodside Subdivision pump station. This force main consists of 950 feet of 3-inch diameter PVC pipe.

4.3.5.1 Grinder Pump Collection Systems

Since the approval of the last sewer plan in 2006, several low pressure sewer developments have been constructed. Approximately 1,444 feet of 2-inch, 2,090 of 3-inch, and 2,678 of 4-inch low pressure sewers were installed. The largest development is the Highlands at Langley with approximately 3,123 feet of low pressure sewers.

4.3.6 Force Main Analysis

The Department of Ecology (Ecology) stipulates that force main (discharge piping) velocities should be equal to or greater than 2 feet per second and not exceed 8 feet per second (to avoid high friction losses and pipe damage). The capacity of various sized force mains as calculated using the Hazen-Williams equation with a roughness coefficient "C" value of 120 is shown below in Table 4-5.

Table 4-5: Force Main Capacities Using Hazen-Williams Equation w/ "C" = 120

Pipe Diameter (inches)	Max [a] Flow (gpm)	Friction Loss (ft. / ft.)	Min [b] Flow (gpm)	Friction Loss (ft. / ft.)
3	180	0.11	45	0.010
4	300	0.07	80	0.006
6	700	0.04	700	0.004
8	1,250	0.03	1,250	0.003

Notes:
[a] Maximum flow with velocities at or below 8 feet per second.
[b] Minimum flows with velocities at or above 2 feet per second.

As shown by Table 4-5, the 8-inch force mains from Pump Stations No. 1 and No. 2 are of sufficient size in terms of velocity to accommodate the projected flows.

4.4 EXISTING SYSTEM IMPROVEMENT RECOMMENDATIONS

A summary of City staff-identified deficiencies and areas of concern is provided below. Please note that the specific deficiencies in pipe segments and manholes are documented during routine system operation. These specific facility deficiencies (pipe runs, manholes, etc.) are addressed in detail in Chapter 6 – System Recommendations while each of the identified system improvement projects listed below includes a general description of current conditions of the facilities along with recommended improvements.

This Plan will identify programs to identify and repair structural problems that are apparent within the existing collection sewer system. Problems within the system may include missing or damaged manhole channels, protruding laterals, excessive pipe vertical deflection ("Sags"), and miscellaneous problems. The miscellaneous problems included hanging or loose gaskets, cracked pipes and offset joints (without signs of infiltration), concrete deposits and grease buildup in the sewer mains.

4.4.1 Illegal Connections

Prior to the 2006 Plan, smoke tests identified commercial and residential buildings with improper sewer connections. Buildings with roof drains and footing drains connected to the City's sanitary sewer system are considered illegal connections and are not allowed. As such, owners should be required to correct these issues.

4.4.2 Protruding Side Sewers

Inspections have indicated that several laterals are extended through the line. The protruding side sewers block the flow through the main and can potentially fully block the line, causing problems such as backflow into buildings. Inspections have indicated that at least seven pipe

runs have protruding side sewers along the run. The protruding side sewers should be evaluated by a cutting contractor to determine if the side sewers are affecting the sewer line capacity and if they can be cut by internal methods.

4.4.3 Leaking Side Sewers

It is anticipated that there are several leaking side sewers within the system. At this time, it is unknown the extent of the problem, however, leaking side sewers will be evaluated at the next smoke and video test of the system.

A method to repairing leaking side sewers is internal injection grouting. The process for sealing side sewer connections to lines is similar to the line sealing process except the grouting unit has a third air bladder plug that is inserted into the service lateral.

Leaks in side sewers further from the main line can be rectified or repaired by injection grouting. This entails constructing an inspection tee in the side sewer near the building, placing a plug in the tee, injection grouting the side sewers with the internal line unit, blowing the grout from the side sewers into the line, and flushing the line.

4.4.4 Vertical Deflection (Sags)

Typically, pipe deflection, although it can cause debris deposition, does not significantly impact pipe capacity as the debris is usually naturally flushed out during high flows. The existing pipe deflections can only be corrected by re-installing the pipe. Correcting pipe deflection by replacing the sewer line is not cost effective, but the City should perform this remediation in severe cases. The City should, however, implement a flushing program for bellied pipe.

Pipes with vertical deflections will need to be identified during the next smoke and video test to identify problem pipes.

4.4.5 Leaking Trunk Sewers

It is anticipated that there are several leaking trunk sewers within the system. At this time, it is unknown the extent of the problem, however, leaking trunk sewers will be evaluated at the next smoke and video test of the system.

Cracked sewer lines, or lines with leaking joints, can be either replaced or relined depending on the structural integrity of the pipe and whether sufficient capacity remains if the sewer is relined.

Replacing sewer line costs the same, if not more, than constructing a new sewer line because of added difficulty in maintaining existing service (bypass/pumping), reconnecting side sewers, and disposing of old pipe. Relining sewer lines is accomplished through several available technologies that avoid excavation to access the pipe.

A more cost effective solution to sewer main joint and crack remediation is injection grouting. Injection grouting sewer main cracks (or joints) involves a special mechanical unit. The injection grout unit is tracked or pulled into position over a pre-determined location of infiltration (by previous video inspection). The unit has two air bladder plugs on either end that allow isolated air testing of the sewer main location and injection grouting.

4.4.6 Protruding Roots

Protruding roots are a major factor in I&I within the system. It is recommended that the City contract with a contractor specializing in cutting out and cleaning sewer lines.

4.4.7 Leaking Manhole Lids and Cleanout Caps

There are leaking manhole lids and cleanout caps within the system. At this time, it unknown the extent of the problem, however, leaking manhole lids and cleanout caps will be evaluated at the next smoke and video test of the system. Manholes and cleanout caps with holes or cracks allow surface water to enter the sanitary sewer system, especially when located in areas of surface water ponding.

The average manhole cover replacement will entail removing the existing manhole frame and cover and replacing them with a new frame and watertight cover. Alternatively, it is recommended that an inflow prevention device can be installed in the existing frame. The typical cleanout cap replacement will involve hand excavation of the existing cap, removal of the existing cap, and replacement of the cap.

4.4.8 Manhole Channels

Manholes within the system will need to be rechanneled, however it is unknown since the last plan which will require repair and rechannelization. Manhole channels need to be checked during the next smoke and video test to identify the problem manholes within the system.

4.4.9 Leaking Manholes

Leaks in manholes can potentially cause significant infiltration into the sewer system. The leaks were noted at manhole section joints, pipe protrusions, and ladder attachments. Inspections have indicated an exposed gasket in one manhole which could be a problem in other manholes. The leaks can be sealed with special grout or sealer but in any case will require entry into the manholes in which all confined space regulations apply. It is recommended that the City contract with a contractor specializing in manhole sealing by injection grouting.

Several or all of the manholes should be repaired under one contract to save mobilization costs. In fact, some of the manholes with infiltration problems also require channeling work which could be completed at the same time.

4.4.10 Miscellaneous Structural Problems

Other problems noted by inspections include unknown objects, exposed gaskets, cracked or offset joints (without infiltration), concrete deposits, debris deposits, and broken pipes.

4.4.11 Pump Stations

4.4.11.1 Malfunctioning Equipment Replacement

The only significant problem regarding the pump stations is the pumps, telemetry, and electrical controls at the Sunrise Beach Pump Station as noted earlier. They have needed upgrading since the 2006 Plan.

4.4.11.2 Capacity Increase

The 2006 Plan recommended increase in Pump Station No. 2 capacity to 500 gpm, because it was potentially reaching its capacity by 2015. Capacity was not reached prior to 2015, however, it is still recommended to increase Pump Station No. 2 capacity from the existing 400 gpm to 500 gpm at 87 ft TDH to meet future flows.

4.5 ONGOING MAINTENANCE PROGRAMS

It is recommended that the City implement ongoing programs to identify deficiencies in the sewer system and provide ongoing maintenance. By maintaining the sewer facilities, the expansion and/or upgrades of trunk lines, pumping stations and treatment facilities may be delayed further into the future where a larger customer base will be available to share in the costs of improvements.

4.5.1 Annual Renewal and Replacement

It is recommended that the City budget annually for pipeline emergency repairs, rehabilitation and/or replacement projects. These projects are generally described as those required to solve immediate issues in the collection system, extend the useful life of the system, and address known deficiencies before they become costly problems associated with system back-ups or pipeline failures. Regular renewal and replacement of the sewer system protects the investment in, and extends the useful life of existing facilities.

4.5.2 Infiltration & Inflow Program

An I&I identification and rehabilitation and renewal program is recommended for the City. It is understood that the system is able to handle the capacity at this time and in the future, however, it becomes increasingly important to monitor I& I as it can take up valuable capacity that would otherwise be available for future development.

A general program for I&I identification and reduction typically includes identification of high suspect facilities through classification of pipe segments by age, material and most importantly, field information. Utilizing this information, a program for inspection and monitoring of facilities can be identified. Inspection of facilities can be accomplished in several different ways: by actual flow monitoring and comparison of wet weather and dry weather flows to determine the magnitude of the problem, by video inspection of lines to identify cracks, pipe segment separations, root intrusions, etc., and by smoke testing of the lines and facilities.

A detailed overview of the recommended pipeline rehabilitation and renewal program is located in Appendix F.

CITY OF LANGLEY EXISTING SYSTEM MAP FIGURE 4-1

Legend

Existing System

- Lift Station
- Manhole
- Valve Assembly
- 6 "
- 8 "
- 10 "
- 12 "
- FM
- Low Pressure Sewer
- 20ft Contour (srce:LiDAR)
- City Limits
- Urban Growth Boundary

Basin Boundaries

- (C) Central
- (E) East
- (W) West

N S E W

0 150 300 600

Feet

Map Print Date:January 22, 2016

Data Sources:
City of Langley, Island County, and PACE Engineers, Inc.

PUMP STATION NO. 1

PUMP STATION NO. 2

LANGLEY CITY HALL

CITY OF LANGLEY WASTEWATER TREATMENT PLANT

Urban Growth Area Boundary

STUBBED FOR FUTURE GRAVITY SEWER EXTENSION

INTERIM WOODSIDE LIFT STATION

SARATOGA PASSAGE

Saratoga Creek

Brookside Creek

Noble Creek

SARATOGA RD

BRACKENWOOD AVE

STRAWBRIDGE LN

TOMPKINS RD

DE BRUYN AVE

1ST ST

MCLEOD ALY

2ND ST

3RD ST

4TH ST

5TH ST

6TH ST

LOUISA ST

SUNRISE LN

WHARF ST

CASCADE AVE

ANTHES AVE

COTTAGE LN

PARK AVE

ISLAND VIEW LN

GROOM LN

NOBLECLIFF PL

EDGECLIFF DR

CAMANO AVE

WOODSONG LN

DECKER AVE

FURMAN AVE

GLEASON LN

SUZANNE CT

PINEY KNOLL LN

AL ANDERSON AVE

LANGLEY RD

TALKING CIR

MAXWELTON RD

CEDAR CIR

CEDAR ACRES LN

WOODSIDE LN

CANFIELD DR

BROOKS HILL RD

INGLEWOOD DR

COLES RD

NIGHTHAWK RD

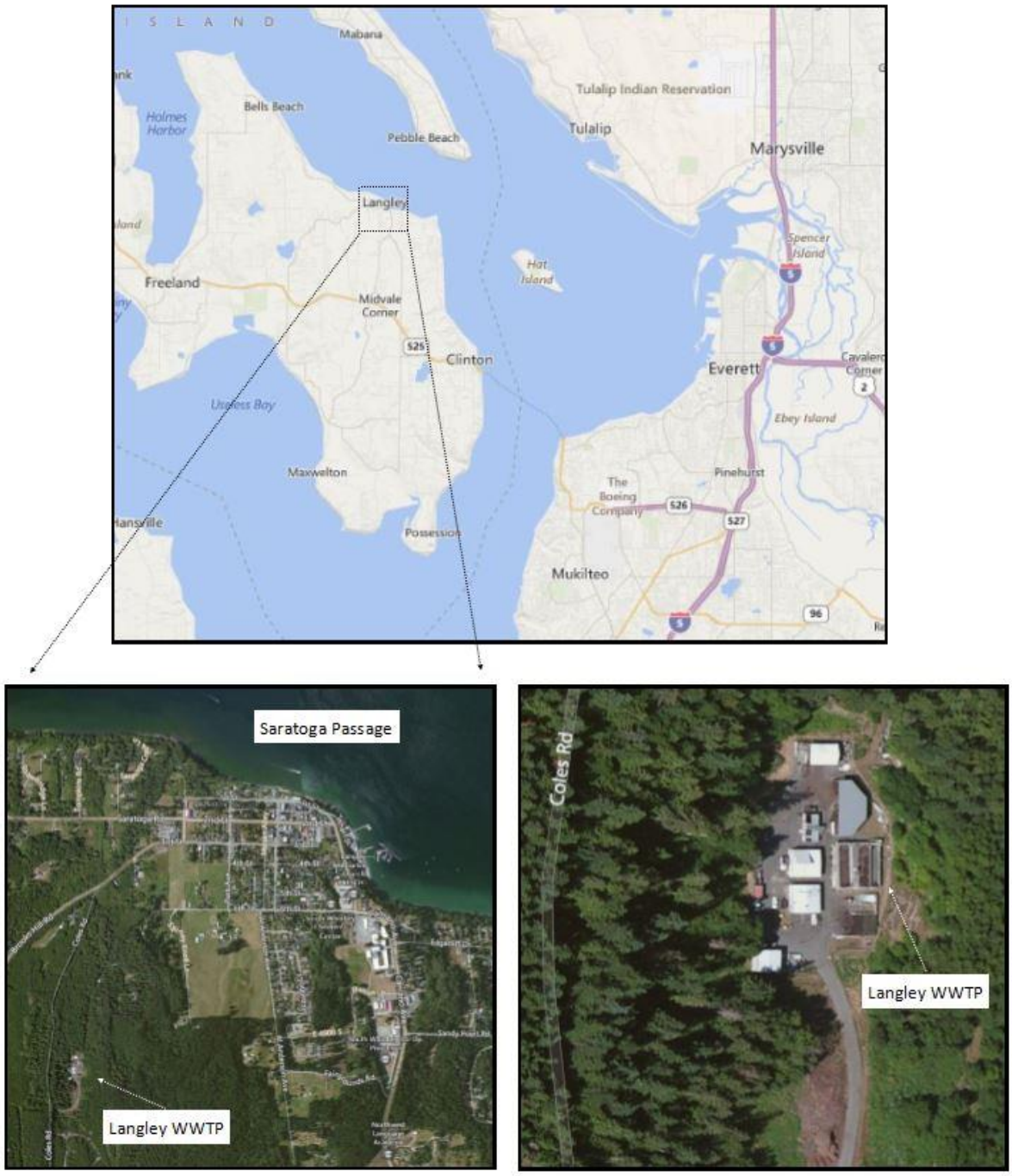
120 ft

Document Path: J:\UtilityDistrictsAndCompanies\LangleySewerDistrict\GIS\ArcMapDoc\Chapter Figures\Figure 4-1 Existing System Map2.mxd

Chapter 5:
Wastewater Treatment Plant Analysis

This chapter presents a description and review of the City's WWTP (Wastewater Treatment Plant). The WWTP location is shown on Figure 5-1.

Figure 5-1: Wastewater Treatment Plant Location



All flow from the City's existing sanitary sewer system is pumped to the treatment plant for treatment and disposal. The plant is located at Coles Road on the south side of the City. The existing plant received its current NPDES Permit No. WA-002070-2 issued in July 30, 2014 and expires on August 31, 2019. The treatment plant was designed to treat a flow of 0.15 million gallons per day (mgd), 425 pounds per day of biochemical oxygen demand (BOD) and 425 ppd (pounds per day) of total suspended solids (TSS). A copy of the City's NPDES permit is located in Appendix C.

5.1 PROCESS DESCRIPTION

The existing WWTP was completed in 1992 and contains three basic wastewater treatment process steps: preliminary treatment, secondary treatment and disinfection. The treatment plant is designed to remove at least 85% of the BOD and suspended solids present in the incoming wastewater. The treatment units consist of a grit chamber, influent Parshall flume, 3/8-inch bar screen with screenings washer and compactor, two Sequencing Batch Reactors (SBR), and a chlorine contact chamber. At the headworks, wastewater from the grit chamber passes through a Parshall flume flow meter. Flow measurements for permit reporting and for analysis are based on the effluent flow meter, which is an ultra-sonic device.

Following screening, wastewater flows by gravity to one of two SBR basins (171,600 gallons each). Both SBR basins are in service throughout the year. Flows alternate between the two SBRs; one processes wastewater while the other fills with wastewater. The SBR processes the wastewater in 5 to 6 cycles per day. Each cycle includes fill, react (alternating aeration and anoxic mixing), settling, decant, and idle.

Effluent is decanted from the top of the SBRs to one of two chlorine contact chambers for a contact time of at least one hour. Both contact chambers are usually in operation and are cleaned every 6 months. Each chamber can be isolated for cleaning or operation. Liquid chlorine is used for disinfection. Effluent flows by gravity from the chlorine chambers to the outfall line and eventually to the Saratoga Passage in Puget Sound. A plant flow diagram of the treatment facility is shown in Appendix D.

Waste activated sludge is digested in two aerobic digesters. The digested sludge is dewatered on a belt filter press and then composted on site. The Class A compost is available for free to the community. A fee is charged if City personnel and equipment are used to load trucks with compost.

5.1.1 NPDES Waste Discharge Permit Requirements

The Washington Administrative Code (WAC) requires that an operating permit be issued by the Department of Ecology before wastewater is discharged into the waters of the state.

The City of Langley's WWTP is operating under NPDES Permit No. WA-002070-2, issue date: July 30, 2014; expiration date: August 31, 2019. A copy of the permit is included in Appendix C. The effluent limitations as specified in the permit are shown below in Table 5-1.

An NPDES permit requires the City to discharge wastewater plant effluent, which meets the Water Quality Standards of Saratoga Passage and the limitations of the Environmental Protection Agency (EPA). Section S1 of the permit establishes the effluent limitations that the wastewater treatment plant must not exceed.

Table 5-1: NPDES Permit Effluent Limits		
Parameter	Permit Limit	Units
Max Month Avg. Daily Flow	0.15	mgd
Annual average design flow rate	0.135	mgd
BOD_5 loading for max month	425	lbs/day
TSS loading for max month	425	lbs/d
BOD_5 b[1]		
Monthly Average	30/38	mg/l/lbs/d
Weekly Average	45/56	mg/l/lbs/d
TSS		
Monthly Average	30/38	mg/l_lbs/d
Weekly Average	45/56	mg/l_lbs/d
Fecal Coliform Bacteria		
Monthly Geometric Mean	200	MPN/100 ml
Weekly Geometric Mean	400	MPN/100 ml
PH		
Maximum	9.0	pH units
Minimum	6.0	pH units
Total Residual Chlorine		
Monthly Average	0.5	mg/l
Maximum Day	0.75	mg/l
Ammonia	No Limit	NA

Notes: The monthly and weekly averages are based on the arithmetic mean of the samples taken with the exception of fecal coliform, which is based on the geometric mean.
[1] The monthly average effluent concentration for BOD and TSS shall not exceed 30 mg/l or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.

5.1.2 Design Capacity

The treatment plant was designed to treat a flow of 0.15 mgd, 425 pounds per day of biochemical oxygen demand (BOD) and 425 lb/day of total suspended solids (TSS).

5.1.3 Reliability

As required by Ecology, the treatment plant operates under a reliability standard which establishes minimum levels of reliability for the class of sewerage works. The City of Langley's treatment plant operates under a tier II classification for reliability, which states that their discharge would not permanently or unacceptably damage or affect the receiving water or public health during periods of short-term interruptions, but could be damaging if continued interruption of normal operations were to occur (on the order of several days)

Also as required by Ecology, the source of backup power has a minimum capacity for each reliability classification. According to the City's tier II classification, the City's treatment plant must maintain sufficient power backup to operate all vital components with critical lighting and ventilation during peak wastewater flow conditions. It also must support the secondary processes for levels of treatment sufficient to maintain the biota.

5.1.4 Septage

The City received about 730,000 gallons in 2008 and about 540,000 from January through June 2009. Since then they have reduced the loads of septage because the two aerobic digesters are not large enough for the additional load. Solids dewatering is poor when large quantities of septage are put in the digesters.

The WAC 173-308-205 which was signed into law in 2007 states that screening of septage be through a bar screen with a maximum aperture of 3/8 inch. The City of Langley complied with this new rule and replaced the previous 1 inch manual screen with a 3/8 inch mechanical screen.

Haulers also reduced hauls to the Langley facility because the septage receiving unit required too much time to process the loadings and (maybe you could recommend a prescreen or an alternate unit designed to remove solids more efficiently) began to direct the septage to the Island County facility. Currently the City receives loads from one hauler a few times a week.

5.1.5 Status of Mechanical and Electrical Equipment

Table 5-2 presents a brief summary of the status of key mechanical and electrical equipment in the process train. The primary pieces of equipment that need replacement are the antiquated programmable logic controller (PLC) and the undersized back-up-power generator. The PLC is the original that came with the plant, integral to plant operation, and needs to be replaced. The PLC is outdated which makes it difficult to repair, requires additional maintenance, and jeopardizes plant reliability.

The generator is also an original piece of equipment and is not large enough to provide the power required to operate all key equipment and comply with reliability criteria set for by Ecology. It only provides enough power to operate one blower to the SBRs. During a power outage the jet pumps cannot be used which severely limits both mixing and air distribution in the SBRs. Also the sludge wasting pumps and automated valves must be operated manually; this requires operators to be available to make changes every four hours for the duration of a power outage. Although the frequent power outages have been managed successfully, the generator should be replaced to assure that adequate treatment capacity is available during peak loads and for extended power outages. This greatly increases system reliability and avoids potential plant overflow during power outages.

The blowers and jet pumps are critical treatment equipment for the SBRs and aerobic digesters that are maintained and replaced as needed. Automated valves, waste activated sludge pumps and other equipment are similarly replaced or repaired as needed (Table 5-2).

Table 5-2: Status of Key Process Equipment		
Process Unit	Equipment	Status
Equipment Building		
SBR blowers	3 - 15 hp positive displacement blowers; 2 – Robushi (original) 1 – Gardner Denver (installed 2006)	Good condition, SBR#2 blower motor new in 2014
Aerobic Digester blowers.	2 – 5 hp positive displacement blowers; 1 – Gardner Denver Sutorbilt (installed 2004) 1 – Universal RAI	Good condition, aging
Generator	Genrac – Test run weekly Check 2x/week, annual service and load banking	Unit is undersized and cannot power all key equipment. The unit should be replaced.
Filter belt press	Aeromod Tritan, new in 2007; LMI peristaltic pump for polymer	Good condition Good condition
Sludge grinder	Muffin monster	Replaced with screen, washer and compactor in 2012.
Screen Washer and Compactor		New in 2012. Good condition.
Electrical	Original PLC	Needs to be replaced
Inplant drain pumps	2- 3.25 HP KSB KRT 100.4-1.5	Spare recommended
Potable water pressure tank/pump	Original	Due to be replaced
Headworks		
Headworks	Grit channel and bar screen	Good condition
Parshall Flume	Sonic level measurement	Good condition
Influent grinder	Muffin monster	Replaced
Sequencing Batch Reactors	Aqua Aerobics	
Waste activated sludge pumps	KSB – 2.5 hp, 50 gpm pumps 1 ea SBR	Work fine but old (1 spare on hand). Flow meter is poor condition, recommend replacement.
Jet pumps	Flygt 10 hp	New one in 2014, second rebuilt in 2014, each needs replace or rebuild in every 5-7 years(spare purchase recommended)
Decanter		Good condition
Jet aerator	Original	Good condition in 2013 contained some build up/rags
Aerobic digesters		
Polymer pump		Good condition. Original- spare purchase recommended
Chlorination equipment	Chlorinator/injectors 2- original pumps original	Good condition Spare purchase recommended
Effluent flow meter	Electromagnetic	Good condition. In-pipe portion original. External portion was replaced 2004
Compost PAD		Good condition
Pole building (mixing)		Needs repair

5.2 OUTFALL

The effluent from the treatment plant is discharged through a 12 inch ductile iron effluent pipe extends 6,200 feet north through the City and to the treatment plan outfall to Saratoga Passage. The original 12 inch ductile iron outfall was extended 100 feet (to approximately 1,000 feet offshore) to a depth of 46 feet below mean lower low water by connection of a new high density polyethylene (HDPE) pipe. The last 43 feet of the 12 inch HDPE outfall contains ten 3 inch diffuser ports alternate locations on each side of the outfall at 40 feet below mean lower low water. The first six ports are 5 feet apart and the last three are 4 to 6 feet apart. The final diffuser port is in the end plate of the outfall diffuser section. This configuration ensures diffusion of treated effluent to minimize impact on water quality.

Saratoga Passage is designated as a Class A marine water in the vicinity of the outfall. Characteristic uses include the following: fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; recreation; commerce and navigation. Saratoga Passage is considered an estuary for the purpose of assigning a mixing zone.

The City of Langley conducted an outfall inspection on December 4, 2012. The inspections included the original segment of the outfall line and the more recent extension of the outfall line. The original segment of the outfall line showed signs of corrosion but no holes were present. Overall the outfall is in good condition and remains fully functional. The next outfall inspection will be required the first year of the next permit cycle (2020)

5.3 FOLLOW UP ON 2006 RECOMMENDED IMPROVEMENTS

5.3.1 Dewatering

The City replaced the batch fed inclined gravity dewatering bed with an Aeromod Tritan continuously fed belt filter press. This has improved the solids dewatering capacity at the plant. All solids generated at the plant are composted.

5.3.2 Bubbler Level Sensors

Bubbler systems for water level sensing were mentioned as significant problems in the 2006 Comprehensive Sewer Plan. The bubblers in the Parshall flume and SBRs have both been replaced with pressure transducers (or ultra-sonic). The bubbler system at Pump Station No. 2 was upgraded to a hydrorange ultra-sonic system in 2009. Pump Station No. 1 is still using the bubbler system and a change out is recommended.

5.3.3 Compost System Improvements

The 2006 Sewer Plan identified the need to increase the compost area at the north end of the treatment plant site and improve drainage on the site. This modification was not made and is not as critical since the City has reduced the flows by reducing septage treatment at the plant in favor of septage treatment at Island County regional facilities. The City is producing about 25% of the compost that it produced in 2009 and 2010 when they were producing about 100 tons per year and receiving large volumes of septage (>1,000,000 gallons septage). Compost production in 2013 and 2014 were less than 25 tons and is well managed on the existing site. Composting is expected to be adequate for the next permit cycle.

The City also planned to purchase a front end loader to help with composting operations but purchased a back hoe to meet the shared need with in other areas of the Public Works department.

5.3.4 Septage Processing

In the 2006 plan update, the City was considering accepting significant quantities of septage for treatment at the WWTP. They estimated that several local septic tank pumpers could dispose of septage at the WWTP and could easily deliver as much as 6,000 gallons per day (gpd).

In order to meet the potential loads from septage, it was recommended to purchase a septage processing unit and additional aerobic digester capacity. The City purchased and installed an AqualiTech septage processing unit to screen solids to comply WAC 173-308-205 but did not add a third aerobic digester. Since then, they have reduced the loads of septage because the two aerobic digesters do not provide enough treatment capacity for the additional load.

Four changes/installations need to be made before large quantities of septage are taken:

- Additional aerobic digester along with a higher capacity septage processing unit.
- A prescreening unit to allow shorter dumping time by the septage haulers.
- Separate pumping station to allow for the belt press to run while trucks dump.
- Hire additional staffing to handle the additional compost processing work load.

There are no recommended changes or future plans to accept large quantities of septage at this facility.

5.3.5 Upgrade

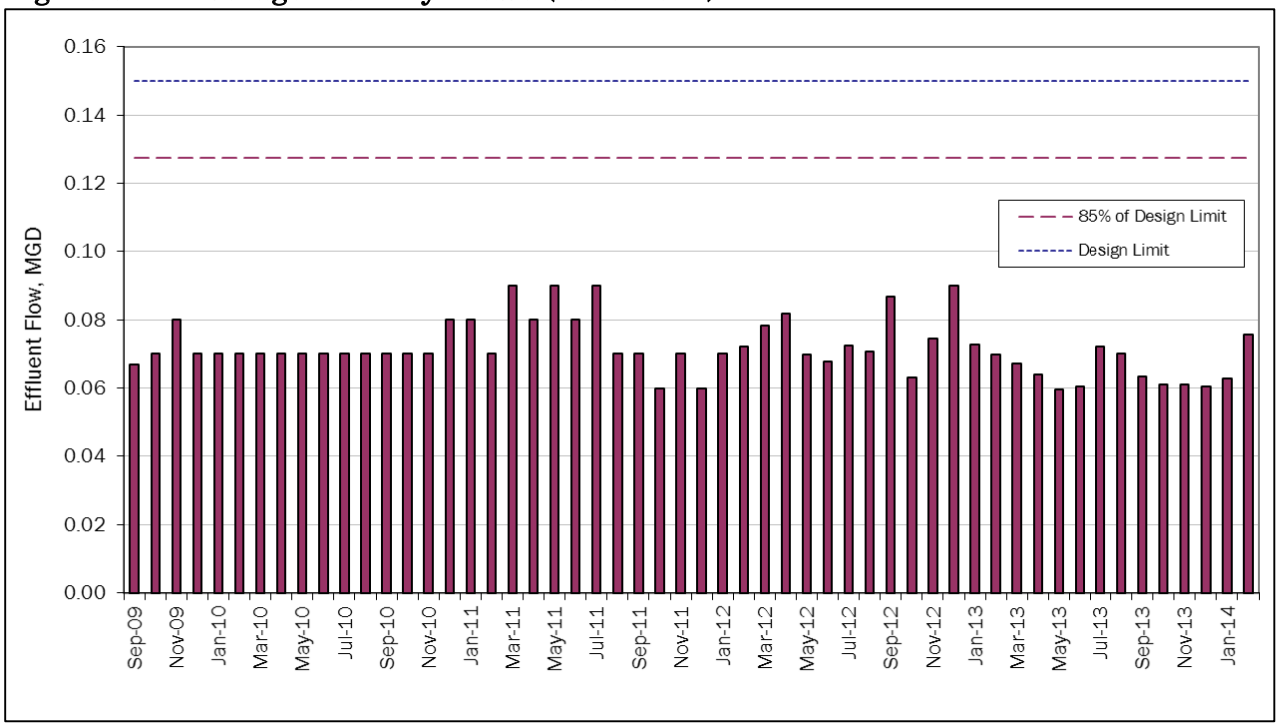
Long term improvements recommended in the 2006 Sewer Plan were for expansion and improvements between 2006 and 2018. The facility has been meeting permit requirements and received a new permit in 2014. No plant expansion is planned during the next permit cycle.

5.4 ANALYSIS OF EXISTING WWTP

5.4.1 Historical Flow and Loading Summary

Effluent flow is measured with a magnetic flow meter located between the SBRs and the chlorine contact tank. The data collected by the effluent flow meter is used for NPDES permit reporting purposes, and is used in this report for evaluating flows. Flow records from January 2009 through February 2014 are summarized. Average monthly and maximum daily flows for this period are shown in Figure 5-2.

Figure 5-2: Average Monthly Flows (2009-2014)



The average annual flow for the period was 0.072 mgd and the maximum month average daily flow was 0.09 mgd. Both are below the permit limits; average annual month design flow is 0.135 mgd and the maximum month design flow for the plant is 0.15 mgd. The annual maximum month flow is about 53% of the maximum month design flow. Table 5-3 shows that both the average annual and average maximum daily flows have not changed significantly over the last seven years.

Table 5-3: Annual Average Flow and Average Maximum Daily Flow

Year	Average Flow (mgd)	Average Maximum Daily (mgd)
2007	0.078	na
2008	0.081	na
2009	0.072	0.107
2010	0.071	0.094
2011	0.076	0.113
2012	0.090	0.103
2013	0.073	0.088
2014	0.076	.171

Source: Langley WWTP_DMR Data, 2009-2014

Treatment plants are designed to remove solids (TSS), soluble organic compounds (BOD_5), and nutrients that are present in the raw wastewater. This plant is permitted to receive specific loads of BOD and TSS at the plant and to discharge specific loads of BOD and TSS into Puget Sound (Table 5.1). A trigger for determining if the facility should be expanded is when the maximum monthly loads exceed 85% of the permitted maximum monthly load for

three consecutive month or the plant flow or loading would reach design capacity within five years. In general, influent BOD loads (Figure 5-3) and effluent concentrations of BOD and TSS discharged to the Puget Sound are very low relative to the permit limits (Figures 5-4 to 5.5).

Between 2009 and 2014, the influent BOD load averaged 206 lbs/day and the average maximum daily load was 292 lbs/day. The design BOD loading for the plant is 425 lbs/day; 85% of design load is 361 ppd. Average maximum daily load was significantly less than 85% of the design capacity, therefore despite some maximum daily loads in 2010 that were greater than 500 lbs/day, the BOD loads are well within design capacity. The maximum average daily BOD load measured was 569 lbs/day; the peak BOD daily loads had no obvious effect on effluent BOD concentration or effluent loads.

Between 2009 and 2014, the influent TSS loading averaged 193 lbs/day and the maximum month average was 383 lbs/day. The design influent TSS loading for the plant is 425 lbs/day; 85% of design load is 361 lbs/day. The maximum month average daily load of 383 lbs/day of TSS exceeded 85% of the design capacity in June 2011 and was noted in the 2014 NPDES Permit. This maximum month coincided with an unusually high influent TSS daily peak load of 1,265 lbs/day. The peak load in June 2011 appears to be reflected in the effluent; the maximum month effluent load of 5.3 lbs/day for the five year period, and the maximum weekly effluent concentration of 8.6 mg/L both occurred in June 2011. Notably both the load and concentration are still very low relative to the permit limits and do not exceed expansion criteria.

Figure 5-3: Average Monthly Influent BOD Loadings

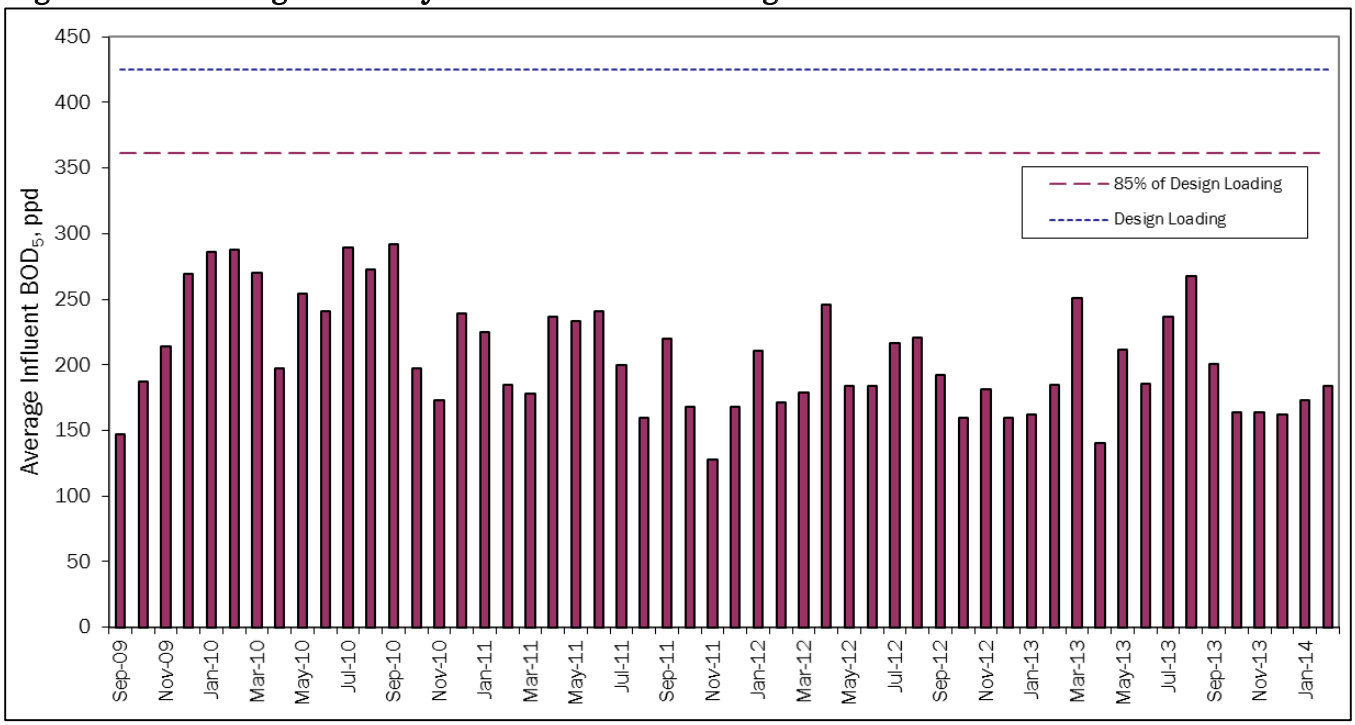
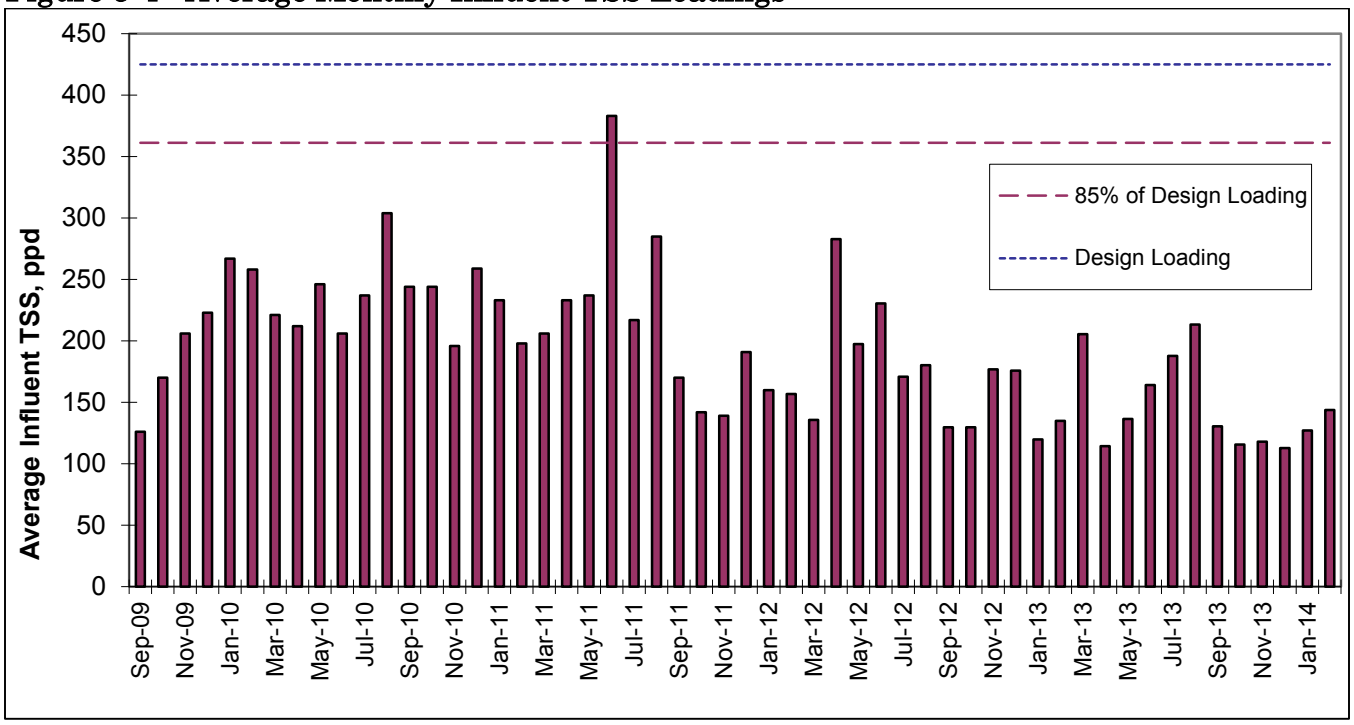


Figure 5-4: Average Monthly Influent TSS Loadings



5.4.2 Historical Performance

Table 5-4 provides a summary of effluent parameters from 2009 to 2014.

Effluent quality for the period from January 2009 through February 2014 has been excellent. Figures 5-3 and 5-4 show average monthly BOD and TSS effluent concentrations respectively. The average monthly effluent BOD and TSS are consistently below 10 mg/L. The NPDES permit limits effluent concentrations for both BOD and TSS to 30 mg/l on a monthly average basis.

Plant records also show that the plant consistently has met the discharge permit limitations for pH and total residual chlorine (Table 5-2). The effluent fecal coliform was always below the weekly effluent limit of 400 cfu/100 mL but exceeded the monthly limit of 200 cfu/100 mL once in August 2013 with a concentration of 219 cfu/100 mL. Generally the average monthly coliform count is consistently below 100 cfu/100 mL.

Table 5-4: Summary of Effluent Quality from 2009-2014

Parameter	Units	# of Samples	Average Value	Maximum Value
BOD_5	mg/L	267	4.2	18.7
BOD_5	lbs/day	267	2.54	11
TSS	mg/L	267	3.7	8.6
TSS	lbs/day	267	2.2	11.7
Parameter	Units	# of Samples	Maximum Monthly Geometric Mean	Maximum Weekly Geometric Mean
Fecal Coliforms	#/100 mL	262	15	219

Table 5-4: Summary of Effluent Quality from 2009-2014				
Parameter	Units	# of Samples	Minimum Value	Maximum Value
pH	Standard units	1,416	6.4	7.4
Parameter	Units	# of Samples	Average Value	Maximum Value
Flow	MGD	1,825	0.072	0.184
Parameter	Units	# of Samples	Average Value	Maximum Value
Total Residual Chlorine	mg/L	1,565	0.18	0.49
Temperature	°C	523 414	19 (summer) 16 (winter)	23 (summer) 17 (winter)
Ammonia (as N)	mg/L	17	0.17	0.38
Nitrate + Nitrite Nitrogen	mg/L	17	11.9	22.7
Total Kjeldahl Nitrogen	mg/L	17	2.34	4.3
Dissolved Oxygen	mg/L	1,049	5.8	11.1
Oil and Grease	mg/L	3	Not Detected	Not Detected
Total Dissolved Solids	mg/L	3	332	349
Total Hardness	mg/L	3	118	124

5.4.3 Production and Processing of Biological Solids

Waste activated sludge is pumped from the SBRs to the aerobic digesters (Figure 5-2) where is aerobically digested. When the digesters are full, which may take up to a week, polymer is added, supernatant returned to headworks and the solids are sent to the belt filter press for dewatering. After dewatering, the biological solids are composted on site (Figure 5-2).

The septage that is received at the plant is screened in the receiving station and is also pumped into the aerobic digesters. Table 5-5 presents the mass and volume of solids received as septage or produced as waste activated sludge between 2009 and 2014. From 2009 – 2012 the facility received volumes of septage that increased the annual total solids production at the facility by 100 – 300%; for example in 2010 solids production from septage was about 77 tons compared to 27 tons of solids produced from waste activated sludge.

The amount of septage received was decreased dramatically in 2013 and 2014. This has reduced total solids production from a peak of 105 tons in 2010 to less than 25 tons/year in 2013 and 2014. Loads of septage received were decreased for two primary reasons: 1). The two aerobic digesters do not provided enough treatment capacity to properly digest the solids which resulted in poor dewatering of solids, and 2). The septage receiving station was undersized and too slow so septic haulers took their loads to the Island County Septage facility in Coupeville.

The decant from the digesters is pumped to the headworks of the treatment plant and contributes to the influent load. This additional load from the septage increased peak BOD and TSS loads to the facility; as could be expected the peak TSS and BOD occurred during 2009-2011 when peak septage loads were received.

The fact that up to 105 tons of biosolids were produced in 2010 with about 77 tons from septage, demonstrates the capacity of the facility and skill of the staff. Although the SBRs were processing loads close to or above the design load, the two digesters were at maximum capacity, and the compost area was overloaded, the operators were able to consistently produce high quality effluent. That said, it is important to note that this level of production required one full time employee dedicated to compost.

Table 5-5 also shows that, between 2011 and 2014, metered flow out of the digesters is 18% - 27% higher than flow entering the digesters. This discrepancy in flows is signification and should be evaluated for causes. Some potential causes that should be evaluated are calibration of metering equipment, methods of estimating flows, and record keeping at the septage receiving station.

The decision to limit septage loads received has reduced influent BOD and TSS loads has had significant impact of the operations and capacity of the facility. Total solids produced are less than 25 tons per year, only 25% of the total tonnage produced in 2009 and 2010. This reduction in solids handling makes it easier to manage solids in the existing digesters and to complete composting in the available area.

Table 5-5: Solids Production for Digestion, Dewatering and Composting.

	2009	2010	2011	2012	2013	2014
Biological Solids composted (Dry ton)						
Waste Activated Sludge	25.76	27.56	32.82	31.69	19.37	
Septage	70.83	77.41	46.62	30.42	4.2	
Total solids generated	96.59	104.97	79.44	62.11	23.57	16.4
Biological Solids into digesters (gal)						
Waste Activated sludge	772,140	826,132	983,850	950,000	695,000	643,000
Septage Haulers						
Brown Bear	417,300	419,000	338,800	345,200	4,000	--
Gabelein	386,300	462,314	129,100	--	--	--
South Island	267,400	297,670	256,300	205,200	121,200	10,400
Arnold Septic	--	--	--	77,200	51,900	--
Main Street	--	--	--	31,400	15,500	10,000
Other	94,000	66,480	123,700	17,000	26,000	21,500
Total septage received	1,165,000	1,245,464	847,900	676,000	218,600	41,900
Total pumped into digesters	1,937,140	2,071,596	1,831,750	1,626,000	913,600	684,900
Manual measured and calculated flows out of digesters (gal)						
Volume decanted			1,170,776	1,305,536	737,109	565,952
Volume to belt press			1,059,079	922,344	380,224	291,867
Total volume out of digester			2,229,855	2,227,880	1,117,333	857,819
Total volume out - Total volume into digester			398,105	601,880	203,733	172,919
Percent flows out of digester unaccounted for			18%	27%	18%	20%

Figure 5-4: Average Monthly Effluent BOD

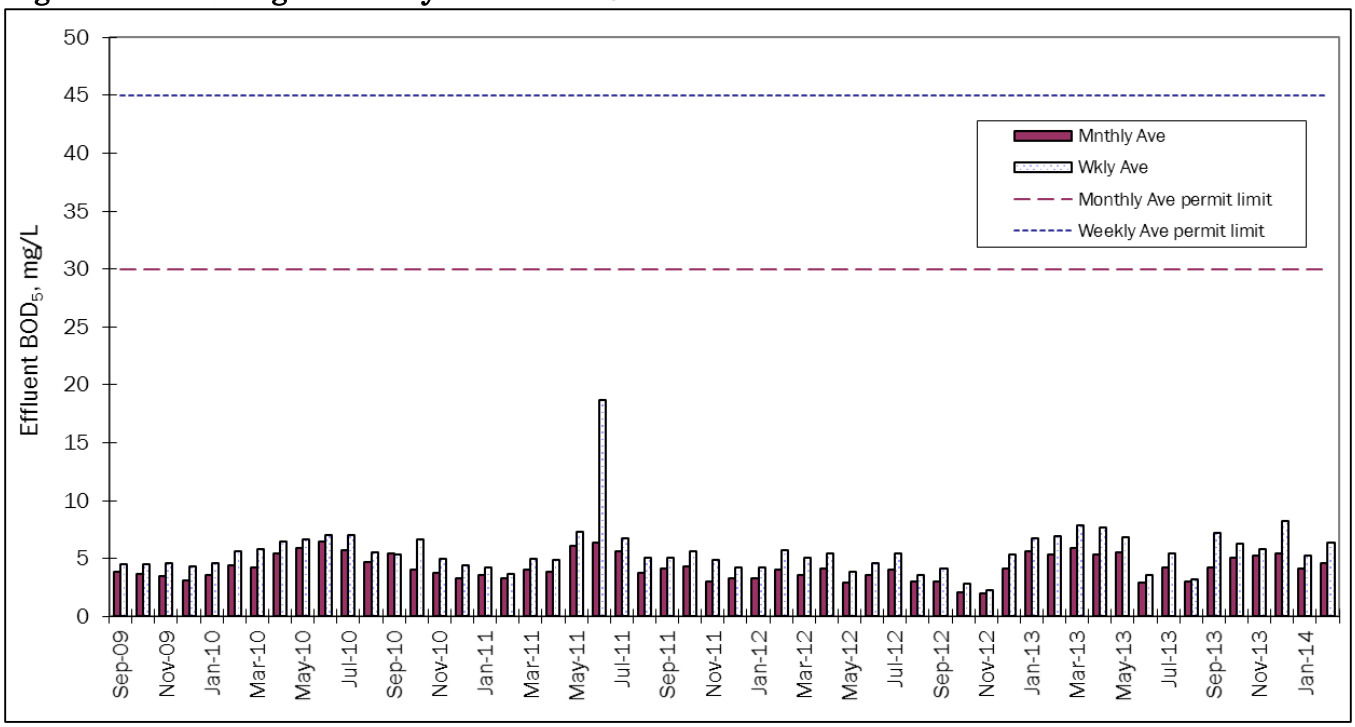
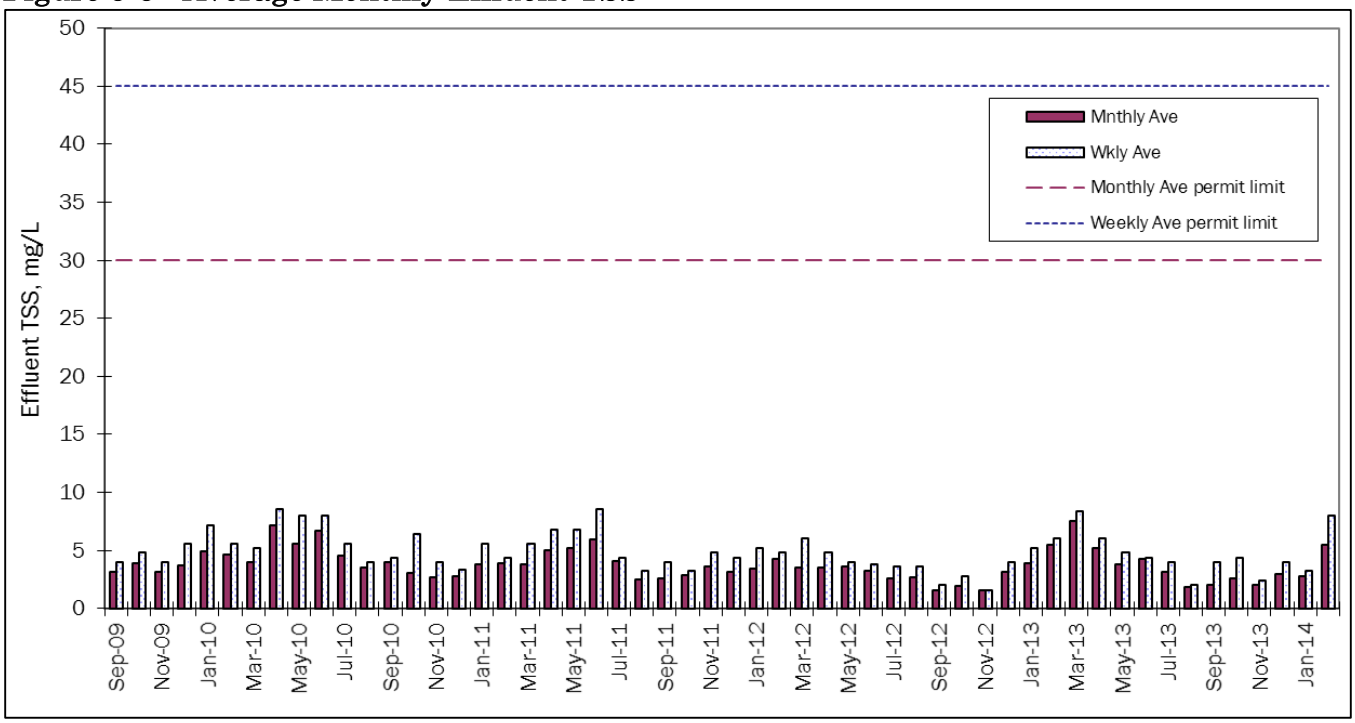


Figure 5-5: Average Monthly Effluent TSS



5.5 INDUSTRIAL WASTEWATER

There are no industrial users discharging to the treatment plant at the present time. The City's Comprehensive Plan containing future land use designations (2013) does not call for future industrial areas.

Restaurants connected to the Langley sanitary sewer system can potentially affect the collection system and the treatment facilities. As previous video inspection of the collection system has showed, sewer mains in the commercial area(s) downstream of connections to restaurants showed signs of grease buildup.

The City of Langley does however have permit requirements for industrial, commercial and business users within the City. In section 13.50.140 of the City of Langley's municipal code it states that establishments may be required to install such pretreatment facilities, devices, or other related appurtenances such as, but not limited to: grease, oil or sand interceptors, comminutors, screens and pH control.

5.6 WATER RECLAMATION AND REUSE

Reuse of reclaimed water is encouraged to lessen the demand on available water resources. Requirements for water reclamation and reuse in the State of Washington can be found in Water Reclamation and Reuse Standards, published jointly by the State Departments of Health and Ecology in 1997. The standards identify four classes of reclaimed water with treatment requirements as shown in Table 5-6.

Table 5-6: State of Washington Reclaimed Water Treatment Standards

Reuse Class	Continuously Oxidized[1]	Continuously Coagulated[2]	Continuously Filtered[3]	Total Coliform Density After Disinfection	
				7-Day Median Value	Single Sample
A	YES	YES	YES	<2.2/100 ml	23/100 ml
B	YES	NO	NO	<2.2/100 ml	23/100 ml
C	YES	NO	NO	<23/100 ml	240/100 ml
D	YES	NO	NO	<240/100 ml	No standard

Notes:
[1] Oxidized wastewater is defined as wastewater in which organic matter has been stabilized such that the BOD (biochemical oxygen demand) does not exceed 30 mg/l and the TSS (total suspended solids) does not exceed 30 mg/l, is non-putrescible, and contains dissolved oxygen.
[2] Coagulated wastewater is defined as an oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated prior to filtration by the addition of chemicals or an equally effective method.
[3] Filtered wastewater is defined as an oxidized, coagulated wastewater that has been passed through natural undisturbed soil or filter media, such as sand or anthracite, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 NTU (nephelometric turbidity units), determined monthly, and does not exceed 5 NTU at any time.
[4] Disinfection is a process which destroys pathogenic organisms by physical, chemical or biological means.

Class A reclaimed water is not practical since it requires coagulation and filtration after conventional secondary treatment while the other classes require standard secondary treatment only. Disinfection requirement are also stricter than the current permit since the reused water could come into contact with humans. Note that the reuse disinfection requirements are based on total coliform

rather than fecal coliform which is measured at the treatment plant.. The coliform limitation in the City's NPDES permit is based on fecal coliform. Reuse requires a higher degree of disinfection than the plant currently is capable of and it is likely that Class B reclaimed water would require filtration as well in order to meet the effluent total coliform density.

5.6.1 Potential Uses of Reclaimed Water

Potential uses of reclaimed water and corresponding treatment requirements are listed in Table 5- 8.

5.6.2 Setback Requirements

Depending on the type of reuse, setback requirements may apply. These are shown in Table 5-9.

5.6.3 Reuse Opportunities for Langley

In order for the City of Langley to produce Class A or Class B reclaimed water, equalization, coagulation and filtration facilities would have to be added to the existing treatment plant. The disinfection system would also have to be upgraded to meet the effluent total coliform density requirements. Furthermore, since the plant is not located near any potential reuse sites, a rather costly reclaimed water distribution pipeline system would have to be constructed.

If the City wants to reuse reclaimed water, they should pursue reuse alternatives that allow use of Class D reclaimed water. The City could make reclaimed water available for agroforestery on land surrounding the treatment plant or reuse effluent at the treatment plant site for such activities as flushing of sanitary sewers and dust control.

Before any type of reuse is allowed, it is recommended that the final effluent is tested to determine if the existing disinfection system is capable of meeting the total coliform requirements listed in Table 5-1.

Table 5-7: Treatment and Quality Requirements for Reclaimed Water Use

Use	Type of			
	Class A	Class B	Class C	Class D
Irrigation of Nonfood Crops				
Trees and Fodder, Fiber, and Seed Crops	Yes	Yes	Yes	Yes
Sod, Ornamental Plants for Commercial Use and Pasture to Which Milking Cows or Goats Have Access	Yes	Yes	Yes	No
Irrigation of Food Crops				
Spray Irrigation	Yes	No	No	No
All Food Crops	Yes	Yes	Yes	Yes
Food Crops Which Undergo Physical or Chemical Processing	Yes	Yes	No	No
Sufficient to Destroy All Pathogenic Agents	Yes	No	No	No
Surface Irrigation	Yes	Yes	Yes	Yes
Food Crops Where There is No Reclaimed Water Contact With	Yes	Yes	Yes	Yes
Landscape Irrigation				
Restricted Access Areas (e.g., Cemeteries and Freeway Landscapes)	Yes	Yes	Yes	No
Open Access Areas (e.g., Golf Courses, Parks, Playgrounds, School Yards, and Residential Landscapes)	Yes	No	No	No
Impoundments				
Landscape Impoundments	Yes	Yes	Yes	No
Restricted Recreational Impoundments	Yes	Yes	No	No
Nonrestricted Recreational Impoundments	Yes	No	No	No
Fish Hatchery Basins	Yes	Yes	No	No
Decorative Fountains	Yes	No	No	No
Flushing of Sanitary Sewers	Yes	Yes	Yes	Yes
Street Cleaning				
Street Sweeping, Brush Dampening	Yes	Yes	Yes	No
Street Washing, Spray	Yes	No	No	No
Washing of Corporation Yards, Lots and Sidewalks	Yes	Yes	No	No
Dust Control (Dampening Unpaved Roads and Other Surfaces)	Yes	Yes	Yes	No
Dampening of Soil for Compaction (at Construction Sites, Landfills, etc.)	Yes	Yes	Yes	No
Water Jetting for Consolidation of Backfill Around Pipelines				
Pipelines for Reclaimed Water, Sewage, Storm Drainage, and Gas, and Conduits for Electricity	Yes	Yes	Yes	No
Fire Fighting and Protection				
Dumping From Aircraft	Yes	Yes	Yes	No
Hydrants or Sprinkler Systems in Buildings	Yes		No	No
Toilet and Urinal Flushing	Yes		No	No
Ship Ballast	Yes	Yes	No	No
Washing Aggregate and Making Concrete	Yes	Yes	No	No
Industrial Boiler Feed	Yes	Yes	No	No
Industrial Cooling				
Aerosols and Other Mist Not Created	Yes	Yes	Yes	No
Aerosols or Other Mist Created (e.g., Using in Cooling Towers, Forced Air Evaporation, or Spraying)	Yes	No	No	No
Industrial Process				
Without Exposure of Workers	Yes	Yes	Yes	No
With Exposure of Workers	Yes	No	No	No
Wetlands				
All Wetlands	Yes	Yes	Yes	Yes
Noncontact Recreational or Educational Use With Restricted Access	Yes	Yes	Yes	No
Fisheries Use, or Noncontact Recreational or Educational Use with Open (Unrestricted Access)	Yes	Yes	No	No
Potential Human Contact Recreational or Educational Use	Yes	No	No	No
Ground Water Recharge	Yes	No	No	No
Indirect Potable Reuse	Yes	No	No	No
Streamflow Augmentation	Yes	No	No	No

Table 5-8: Setback Distances for Reclaimed Water

Condition	Setback Distance in Feet By Type of Reclaimed Water			
	Class A	Class B	Class C	Class D
Minimum Distance between any reclaimed water pipeline and potable water supply well.	50	100	100	300
Where reclaimed water is used for spray or surface irrigation, minimum distance between the area subject to irrigation and any potable water supply well.	50	100	100	300
Where reclaimed water is used for spray irrigation, minimum distance between the area subject to irrigation and areas accessible to the public and the use area property line.	0	50	50	100
Where reclaimed water is used for an impoundment that is not lined or sealed to prevent measurable seepage, minimum distance between the perimeter of the impoundment and any potable water supply well.	500	500	500	NIA
Where reclaimed water is used for an impoundment that is lined or sealed to prevent measurable seepage, minimum distance between the perimeter of the impoundment and any potable water supply well.	100	100	100	NIA
Where reclaimed water is used for a storage pond that is not lined or sealed to prevent measurable seepage, minimum distance between the perimeter of the pond and any potable water supply well	500	500	500	1,000
Where reclaimed water is used for a storage pond that is lined or sealed to prevent measurable seepage, minimum distance between the perimeter of the pond and any potable water supply well.	100	100	100	200

5.7 ENERGY CONSERVATION

The Energy Independence Act (I-937) was passed by Washington State in 2006 and requires Public Utility Districts (PUDs) to encourage energy conservation and development of renewable energy sources within their service districts. Cost share programs from the PUDs and grants from Department of Commerce encourage energy conservation projects at municipal facilities. Puget Sound Energy, the power provider to Langley, has a proactive program that encourages conservation with rebates based on total energy savings and the Washington State Department of Commerce offers grants for up to 25% of the project cost. The grant and rebate programs often combine to produce good returns on an investment for a project.

In some municipalities, the treatment of wastewater can be the single largest consumer of energy. Generally about 65% of the energy used at a wastewater treatment plant is used for aeration (Water Environment Federation 2010 Manual of Practice No. 32). Power consumption during aeration of wastewater can be reduced by installing equipment that allows air to be provided according to actual demands in the treatment units. With use of variable frequency drives, dissolved oxygen (DO) probes, and process control software, energy use in aeration basins can be reduced by 25 - 60%. (WEF 2009); energy conservation of 25 -40% is a reasonable expectation for SBRs.

The Langley WWTP uses aeration to treat the wastewater in the SBRs and for aerobic digestion of the waste activated sludge (Figure 5-2). In general, excessive aeration is often indicated by dissolved oxygen concentrations greater than 4 - 5 mg/L in the aeration basins: concentrations between 5 – 8 mg/L DO are relatively common in the Langley SBRs[1]. This is common in older plants that do not have variable frequency drives available to allow for manual or automatic adjustment of aeration equipment according to demand in the aeration basin. The excess aeration may result in higher power use but performance is not necessarily affected. As is clear, this WWTP has been well operated and successfully produces high quality effluent.

Aerobic digesters are also aeration intensive units; at the Langley WWTP air is supplied twenty-four hours per day to digest solids prior to dewatering and use for compost. The DO is not monitored in the digester so DO concentration cannot be used to give insights into excess aeration. In general reduced power costs may be realized by controlling aeration in the digesters. The digesters can be operated in cycles with or without aeration which allows digester in aerobic and anoxic conditions. Alternatively if DO is maintained at low concentrations (0.1 -0.5 mg/L DO) simultaneous nitrification and denitrification is induced. A disadvantage of the low DO, however, is that digesters may need to be run at higher mixed liquor concentrations (Water Environment Federation 2010 Manual of Practice No. 32).

Taking advantage of anoxic conditions in the aerobic digesters may reduce aeration requirements by 20%. On average it takes about one week to fill a digester; during the fill times, the digester will have lower respiration rates; therefore the peak over aeration probably occur during long tank fill cycles. Savings may increase above 20% if aeration is controlled during fill cycles

Potential power and cost savings were estimated assuming average reductions in power use if DO controls are implemented. Assuming a power reduction 30% for the SBR blowers, and 20 % for the digester blowers, total annual power savings would be about 35,000 kwh/yr. If one assumes an average annual cost for power of $0.096/kwh, annual cost savings would be about $3,500. About 65% of the savings would be due to DO control in the SBRs.

Implementing DO control would require:

1. Estimating the return on investment,
2. One DO probe in each of the SBRs and aerobic digesters,
3. A variable frequency drive (VFD) for the 15-hp blowers,
4. A VFD for the 5-hp blowers for the digester,
5. Process control software,
6. Process control panel.
7. Installation

If the project could be completed for about $100,000 and receive maximum grants from Puget Sound Energy and Department of Commerce, the return on investment (ROI) would be about 20

[1] DO concentrations may actually be slightly less due to methods used to record DO concentrations in SBRs.

years. This ROI is not very good and unless combined with a major facility upgrade these improvements are not recommended at this time.

5.8 RECOMMENDED IMPROVEMENTS

5.8.1 Replace Programmable Logic Controller

The programmable logic controller (PLC) for the entire plant needs to be replaced. There is not enough space in the existing control room for a new PLC without removal of the existing analog controller.

5.9 REMAINING CAPACITY

The remaining capacity of the plant was estimated based on both treatment plant flow and influent BOD. Flow data for 2012 and 2013 show that flows have been very uniform over that period. The average flows for these years were 0.075 mgd and 0.065 mgd, respectively. The average maximum monthly flows were also very similar at 0.10 mgd and 0.09 mgd, well within the 0.15 mgd capacity. Based on the 2013 population of 1053 (from Chapter 2) and the 2013 maximum month flows, a unit flow of 84 gallons per capita per day, including I&I, was calculated and used to project the future maximum monthly flows shown in Table 5-9. Flows were projected using the medium growth rate from the County.

Table 5-9: Projected Maximum Month Flows (mgd)

Year	MMF*
2014	0.088
2024	0.094
2034	0.099

**Growth is calculated using Island County's Medium Growth Rate of 0.59 percent annually*

Based on flow, the plant will not exceed its design hydraulic capacity during the next five (5) years and will not be exceeded during the 20-year planning horizon of this comprehensive plan.

Maximum average influent BOD and TSS loads in 2013 were 263 lbs BOD/day and 214 lbs TSS/day. The average maximum daily loads are both significantly less than the five year averages because of the lower quantities of septage that were received in 2013. Based on the 2014 population and estimated 2013 BOD and TSS loads, the per capita load is estimated to be 0.25 lbs BOD/capita/day and 0.20 lbs TSS/capita/day. These are in-line with general design loads presented in *The Criteria for Sewage Works Design (Washington State Department of Ecology 2008)*, which suggests a design load of 0.20 lbs BOD or TSS/capita/day for residential dwellings. It is recommended that BOD contributions from future residents be based on 0.25 lbs per capita per day. Projected BOD and TSS loadings are shown in Table 5-10.

Table 5-10: Projected Influent BOD & TSS Loadings (lbs/day)

Year	BOD Loading*	TSS Loading*
2014	265	215
2024	281	228
2034	297	242

**Growth is calculated using Island County's Medium Growth Rate of 0.59 percent annually*

The design influent BOD loading is 425 lbs/day; the trigger for design evaluation is 85% of the design or 361 lb/day. The projections also show that the plant projected BOD loading would not reach capacity within the next five years, moreover, the plan has sufficient capacity for the next 20 years.

5.10 SEPTAGE TREATMENT

The City is receiving limited loads of septage from one hauler. The loads must remain limited due to limited capacity of the aerobic digesters. There are no plans for increasing the plant's capacity so that more septage can be received and treated.

5.11 CONCLUSIONS AND RECOMMENDATIONS

5.11.1 Conclusions

- The wastewater treatment plant is operating well and consistently produces an effluent that is well within permit limits.
- The maximum month average daily flow for 2012 through 2013 has been 0.095 mgd, which is 63% of the plant design capacity.
- The maximum average month BOD loading in 2013 263 lbs/day, which is 62% of the design capacity.
- Reducing the quantities of septage that are accepted has reduced influent BOD and TSS loads and has consequently increased the reserve capacity.
- Reducing the quantities of septage accepted has also decreased the annual loads of biosolids processed: In 2010 about 105 tons were processed compared to less than 25 tons processed per year in 2013 and 2014.
- Based on the growth estimates and the current decision to limit reception of septage, the plant has adequate capacity for the next 20 years
- The programmable logic controller (PLC) for the entire plant needs to be replaced. There is not enough space in the existing control room for a new PLC without removal of the existing analog controller.
- The plant emergency generator is not sized to run the blowers and jet pumps that provide air to the SBR tanks.
- Reuse of reclaimed water should only be considered for reuse that is allowable with Class C and Class D reclaimed water. Disinfection upgrades may be required.
- Use dissolved oxygen probes and process controls in the SBRs and aerobic digester are estimated to save about 35,000 kwh/yr, but only yields a ROI of about 20 years.

5.11.2 Recommendations

- The emergency generator should be replaced with a larger generator to allow the SBR blowers to run during a power outage. This will keep the biomass in the SBR basins alive during an extended outage, to meet Ecology class 2 reliability requirements.

- The PLC for the treatment plant should be upgraded to replace the original PLC, again to meet reliability requirements.
- The City should carefully consider the impact on reserve treatment plant capacity before deciding to accept significant quantities of septage.
- Spare equipment should be purchased for aged critical equipment. This will ensure seamless operation in the event of a failure.
- Resurface Chlorine contact chamber walls
- Upgrade Non-potable water system controls
- Install new compost drainage.
- Replace digester blower air lines.
- The waste activated sludge flow meter should be replaced.

Chapter 6: System Recommendations

The previous sections evaluated the existing collection system and wastewater treatment facility and provided recommendations for their improvement. This section will summarize those recommendations, provide a schedule for making the improvements, and estimate the cost of the improvements. Cost estimates are in 2015 dollars and include design costs, administration, construction labor and profit, and tax. All project locations are shown on Figure 6-1, Proposed Sewer System Improvements.

6.1 EXISTING SYSTEM REMEDIATION

6.1.1 Collection System

Table 6-1: Collection System Rehabilitation & Replacement

ID	Recom-mendation	From MH	To MH	Street	Problem Description	Pipe Length	Estimated Cost* ($)
RR-1	Replace or Rehab	E35	E31	Parallel to Brookhaven Creek	Protruding & Infiltration at lateral @ 127.5 feet from E35	50	$15,500
RR-2	Replace or Rehab	E43	E43A CO	Alley south of Groom Lane	Protruding roots, ponding, and compressed piping	290	93,000
RR-3	Replace or Rehab	N13	N12	Mcleod Alley	High infiltration @ 15 & 28 feet from N13	70	$21,700
RR-4	Replace or Rehab	E39	E40	6th Street	Broken pipe @ 30 feet from E39; Protruding lateral @ 31 feet from E40	230	$71,300
RR-5	Replace or Rehab	W65	W64	Alley (Park & Island View Ln)	Protruding laterals @ 330 & 336 feet from W64; Infiltration @ 22 feet from W64	400	$124,000
RR-6	Replace or Rehab	W70	W69	Anderson Road	High infiltration and saging of pipe between W71 and W69.	300	$93,000
RR-7	Replace or Rehab	W69	W67	6th Street	Sagging @ 162 feet from W67; Concrete in pipe @ 208 feet from W67	200	$62,000
RR-8	Replace or Rehab	W71	W70	Anderson Road	Sagging @ 103, 145, & 198 feet from W70	320	$99,200
RR-9	Replace or Rehab	W75	W72	Suzanne Court	Sagging @ 18, 58 & 69 feet from W75	220	$68,200
RR-10	Replace or Rehab	W72	W71	Suzanne Court	Sagging @ 126 & 135 feet from W72	160	$49,600
RR-11	Replace or Rehab	N21	N22	3rd Street	High infiltration @ 16 feet from N21	250	$77,500
RR-12	Replace or Rehab	B1	B2	Wharf Street	Infiltration @ 63 feet from B1	165	$52,700
RR-13	Replace or Rehab	E28	E27	4th Street	Protruding lateral @ 155 feet from E28; Infiltration @ 4 feet from E28	240	$74,400
RR-14	Replace or Rehab	N17	N16	Alley between 2nd Street and 3rd Street	Protruding Roots @ 232 and 270 feet from N17	340	$105,400
						TOTAL	$1,007,500

Notes: * Cost in 2015 Dollars.

Secton 4 provided recommendations for upgrade of the existing collection system. The City has done extensive work already in reducing I&I, and the measures that have been taken were successful. The collection system recommendations for rehab and replacement and their costs are provided in Table 6-1. The recommendations primarily focused on reducing I&I.

The projects were prioritized through observed deficiencies from the most recent inspection report and photos and according to severity of the deficiency. The observed deficiencies were broken pipes, sagging, protruding laterals, protruding roots, debris or blockage and observed infiltration. A quantitative analysis was performed by assigning point values to the deficiencies. The severity of the problem was determined through the photos and then projects were prioritized accordingly.

In addition to the rehab and replacement projects planned by the City, the City will continue to provide regular ongoing, annual maintenance to the system addressing recommendations shown in Table 6-2.

It is understood that side sewer repair on private property is typically the responsibility of the sewer customer. Due to side sewer infiltration being a major contributing factor in the total infiltration in the system, the City plans to repair these side sewers as part of the ongoing maintenance and repairs, shown in Table 6-2, to avoid expansion and needed system repairs of the overall collection system and treatment plant. The city will work at the connection on the main but not on the customer side.

Table 6-2: Ongoing Maintenance & Repairs

ID	Recommendation	Project Description	Estimated Cost*
OM-1	Infiltration and Inflow Control Program	Implementation of annual identification of I&I problem locations	$50,000
OM-2	Cut Protruding Side Sewers	Assume 12 locations requiring cutting at $1,300 per location.	$15,600
OM-3	Repair Side Sewer @ connection with Sewer Main	Assume approximately 20 locations. Repair by grouting at $1,300 per location.	$26,000
OM-4	Cut Protruding Roots	Assume 10 locations requiring cutting at $1,300 per location.	$13,000
OM-5	Repair Manhole Leaks	Assume approximately 5 locations. Repair by grouting at $650 per location.	$3,250
OM-6	Repair Leaking Manhole Lids and Cleanout Caps	Assume approximately 5 manhole lids and 5 cleanout caps to be replaced. Cost to replace MH lids is $380 each and cleanout caps are $250 each.	$3,150
OM-7	Repair Manhole Channels	Assume 5 channels requiring repair at $750 per channel.	$3,750
OM-8	Cleaning and Flushing of Mains	Assume cost for cleaning/flushing is approx. $250 per run. Assume 20 runs.	$5,000
OM-9	Lift Station Maintenance	Annual maintenance (i.e. piping and level controls)	$30,000
		TOTAL	$149,750

*Notes: * Cost in 2015 Dollars.*

6.1.2 Wastewater Treatment Facility

As discussed in Section 5, the existing wastewater treatment facility operates successfully and has very few needed improvements. These recommendations are provided in Table 6-3. The primary pieces of equipment that need replacement are the antiquated programmable logic controller (PLC) and the undersized back-up-power generator. The PLC is the original that came with the plant, integral to plant operation, and needs to be replaced. The PLC is outdated which makes it difficult to repair, requires additional maintenance, and jeopardizes plant reliability. The emergency generator should be replaced with a larger generator to allow the SBR blowers to run during a power outage to meet Ecology class 2 reliability requirements. This requirement states that the City's treatment plant must maintain sufficient power backup to operate all vital components with critical lighting and ventilation during peak wastewater flow conditions. It also must support the secondary processes for levels of treatment sufficient to maintain the biota.

Table 6-3: Wastewater Treatment Facility Recommendations

ID	Recommendation	Notes	Estimated Cost*
WWTP-1	Emergency generator replacement	The emergency generator should be replaced with a larger generator to allow the SBR blowers to run during a power outage.	$186,400
WWTP-2	Programmable Logic Control (PLC) Replacement	The PLC is the original, is antiquated and in need of replacement.	$161,000
WWTP-3	Resurface Chlorine contact chamber walls	Deteriorating wall surface allows for bacteria growth on walls.	$35,000
WWTP-4	Upgrade Nonpotable water system controls	System controls are antiquated and need repair or replacement	$20,000
WWTP-5	Compost drainage	Install compost drainage in Plant.	$10,000
WWTP-6	Replace Digester Blower air lines	Disgester blower air lines are in need of repair or replacement.	$20,000
		TOTAL	$432,400

*Notes: * Costs in 2015 Dollars.*

6.1.3 Pump Station Improvements

Recommendations for the pump stations were presented in Section 4. The recommendation is summarized in Tables 6-4.

Table 6-4: Pump Station Improvement Recommendations

ID	Recommendations	Notes	Estimated Cost*
P-1	Sunrise Pump Station Upgrade	Upgrade pumps, telemetry, and replace electrical controls. New generator.	$236,200
P-2	Upgrades to Pump Station No. 1	Replace piping and upgrade from bubbler system to ultrasonic pump controls for Pump Station No. 1	$100,000
		TOTAL	$336,200

*Notes: * Costs in 2015 Dollars.*

6.2 EXPANSION IMPROVEMENTS

This section discusses potential expansion improvements, (Table 6-5) that are required to serve currently unsewered areas shown in Figure 6-1. These expansion improvements are expected to be funded primarily by developers or through other charges not incurred by the City and therefore are not included in the Capital Improvement Program. The expansion projects shown on Figure 6-1 are conceptual and will require an engineering design and may be different than what is shown. Also, it is unknown at what level and location of new development that will occur and therefore projects shown could be constructed in a variety of intensity and order.

In the eastern side of the City there are two significant environmental concerns. First, maintain slope stability, and second, assure water quality standards are met for the Puget Sound. Expanding sewer to these areas will eliminate septic systems and assist in addressing these environmental concerns.

Serving unsewered areas will require construction of new sewer mains, and will increase the number of connections to the system. Increasing the number of connections to the system will increase the flow to existing downstream facilities, and the flow from certain expansion improvements will necessitate existing system improvements. It is uncertain at this point what type of improvements will be required upon development.

Table 6-5: Gravity Sewer Line Expansion Recommendations

ID	On	From	To	Linear Feet	Costs
EX-1	Cedars Circle	Cedars Acres Lane	Cedars Acres Lane	2,400	$744,000
EX-2	Cedar Acres Loop	Sandy Point Road	South end of Plat, approximately 1600 ft	1,600	$496,000
EX-3	Edgecliff Drive	Approximately 150 feet from Noble Place	Approximately 3,300 feet easterly to City Limits	3,300	$1,023,000
EX-4	Decker Ave	Edgecliff Drive	Approximately 1,200 feet to the South	1,200	$372,000
EX-5	Furman Ave	Edgecliff Drive	Approximately 1,200 feet to the South	1,200	$372,000
EX-6	6th Street	700 feet west of Park Ave	Alley between Park Ave and Island View Ln	1,000	$310,000
EX-7	Saratoga Road	West edge of City Limits	West edge of St Hubert Catholic Church	800	$248,000
EX-8	Brackenwood Ave	End of lane at north end	Saratoga Road	850	$263,500
EX-9	Brooks Hill Road	West edge of City Limits	Intersection of Coles Road	2,100	$651,000
EX-10	Coles Road	2,100 feet south from intersection with Brooks Hill Road	Brooks Hill Road	2,000	$620,000
EX-11	Coles Road	Sound edge of City Limits	Langley WWTP	2,500	$775,000
				TOTAL	$5,874,500

Notes:
All pipe to be 8" - costs at $310/lf
Projects are to be funded by Developers and not included as part of the Capital Improvement Program

Expansion projects will require several pump stations and forcemains to provide gravity sewer service to unsewered areas. The Tables 6-6 and 6-7 along with Figure 6-1 show the conceptual forcemains and pump stations that will provide sewer service to these areas.

Table 6-6: Pump Station Expansion Recommendations

ID	New Pump Station	Number of Pumps	Head Required	GPM	Costs
LS-1	Edgecliff Pump Station	2	30	90	$375,000
LS-2	Sandy Point Road Pump Station	2	40	50	$300,000
LS-3	Brackenwood Pump Station	2	15	30	$200,000
LS-4	Coles Road Pump Station	2	30	6	$200,000
TOTAL					$1,075,000

Table 6-7: Sewer Forcemain Expansion Recommendations

ID	On	From	To	Linear Feet	Costs
FM-1	Edgecliff Drive	East edge of City Limits	Woodsong Lane	2,600	$650,000
FM-2	Sandy Point Road	East edge of City Limits	Connection into existing Woodside Pump Station	1,850	$462,500
FM-3	Brackenwood Ave & Saratoga Road	End of Brackenwood Ave	West edge of St Hubert Catholic Church	1,800	$450,000
FM-4	Coles Road	Intersection of Coles Road and Brooks Hill Road	Langley WWTP	3,200	$800,000
TOTAL					$2,362,500
Notes: *Costs at $250/lf$$$*					

6.3 CAPITAL IMPROVEMENT PROGRAM

The established priorities for individual projects may change based on an increase or change in problems, development, or opportunities for additional funding. The City will need to periodically review project priorities, on an annual basis as a minimum, and change them as appropriate.

The existing system improvement are prioritized into immediate, near term, and long-term improvements. The improvements are summarized in a six year CIP (Capital Improvements Program) shown in Table 6-6, which provides a schedule, cost estimates, and the potential financing mechanism of improvements. Expansion improvements are to be funded primarily by developers or through other charges not incurred by the City and therefore are not included in the Capital Improvement Program.

The funding mechanism, shown in Table 6-6, indicate what method is used to fund the capital project. They include Rates which are the monthly sewer rates (City Sewer Fund 402). The reserves which includes facilities charges & rates (City Sewer Improvement Fund 408). And borrow, where the City will take low interest loans from WA St Ecology, Public Works Trust Fund (PWTF) or a or bond sale.

Table 6-8: Capital Improvement Program

ID	Recommendations	Notes	Schedule	Estimated Cost ($)	Funding Mechanism*
Collection System Rehabilitation and Replacement					
RR-1	Replace or Rehab	Protruding & Infiltration at lateral @ 127.5 feet from E35	Immediate	$15,500	Rates/Reserves
RR-2	Replace or Rehab	Protruding roots, ponding, and compressed piping	Immediate	93,000	Rates/Reserves
RR-3	Replace or Rehab	High infiltration @ 15, 28 feet from N13	Immediate	$21,700	Rates/Reserves
RR-4	Replace or Rehab	Broken pipe @ 30 feet from E39; Protruding lateral @ 31.3 feet from E40	Immediate	$71,300	Rates/Reserves
RR-5	Replace or Rehab	Protruding laterals @ 330 & 336 from W64; Infiltration @ 22 feet from W64	Immediate	$124,000	Rates/Reserves
RR-6	Replace or Rehab	High infiltration and saging of pipe between W71 to W69.	Immediate	$93,000	Rates/Reserves
RR-7	Replace or Rehab	Sagging @ 162 feet from W67; Concrete in pipe @ 208 feet from W67	Near Term	$62,000	Rates/Reserves
RR-8	Replace or Rehab	Sagging @ 103, 145, 198 feet from W70	Near Term	$99,200	Rates/Reserves
RR-9	Replace or Rehab	Sagging @ 18, 58, 69 feet from W75	Near Term	$68,200	Rates/Reserves
RR-10	Replace or Rehab	Sagging @ 126, 135 feet from W72	Near Term	$49,600	Rates/Reserves
RR-11	Replace or Rehab	High infiltration @ 16 feet from N21	Near Term	$77,500	Rates/Reserves
RR-12	Replace or Rehab	Infiltration @ 63 feet from B1	Near Term	$52,700	Rates/Reserves
RR-13	Replace or Rehab	Protruding lateral @ 155.4 feet from E28; Infiltration @ 4 feet from E28	Near Term	$74,400	Rates/Reserves
RR-14	Replace or Rehab	Protruding Roots @ 232.0 feet and 269.8 feet from N17	Near Term	$105,400	Rates/Reserves
Ongoing Maintenance and Repairs					

Table 6-8: Capital Improvement Program

ID	Recommendations	Notes	Schedule	Estimated Cost ($)	Funding Mechanism*
OM-1	Infiltration and Inflow Control Program	Implementation of annual identification of I&I problem locations	Annual	$50,000	Rates
OM-2	Cut Protruding Side Sewers	Assume 12 locations requiring cutting at $1,300 per location.	Annual	$15,600	Rates
OM-3	Repair Side Sewer @ connection with Sewer Main	Assume approximately 20 locations. Repair by grouting at $1,300 per location.	Annual	$26,000	Rates
OM-4	Cut Protruding Roots	Assume 10 locations requiring cutting at $1,300 per location.	Annual	$13,000	Rates
OM-5	Reduce Manhole Leaks	Assume approximately 5 locations. Repair by grouting at $650 per location.	Annual	$3,250	Rates
OM-6	Replace Leaking Manhole Lids and Cleanout Caps	Assume approximately 5 manhole lids and 5 cleanout caps to be replaced. Cost to replace MH lids is $380 each and cleanout caps are $250 each.	Annual	$3,150	Rates
OM-7	Repair Manhole Channels	Assume 5 channels requiring repair at $750 per channel.	Annual	$3,750	Rates
OM-8	Cleaning and Flushing of Mains	Assume cost for cleaning/flushing is approx. $250 per run. Assume 20 runs.	Annual	$5,000	Rates
OM-9	Lift Station Maintenance	Annual maintenance (i.e. piping and level controls)	Annual	$30,000	Rates
Wastewater Treatment Facility Remediation Recommendations					
WWTP-1	Emergency Generator Replacement	The emergency generator is to be replaced with a larger generator to allow the SBR blowers to run during a power outage.	Immediate	$186,400	Rates/Reserves/Borrow

Table 6-8: Capital Improvement Program					
ID	Recommendations	Notes	Schedule	Estimated Cost ($)	Funding Mechanism*
WWTP-2	Programmable Logic Control (PLC) Replacement	The PLC is the original and is antiquated and in need of replacement.	Immediate	$161,000	Rates/Reserves/Borrow
WWTP-3	Resurface Chlorine contact chamber walls	Deteriorating wall surface allows for growth on walls.	Near Term	$35,000	Rates/Reserves/Borrow
WWTP-4	Upgrade Nonpotable water system controls	System controls are getting antiquated and needing repair or replacement	Near Term	$20,000	Rates/Reserves/Borrow
WWTP-5	Compost drainage	Install compost drainage in Plant.	Near Term	$10,000	Rates/Reserves/Borrow
WWTP-6	Replace Digester Blower air lines	Digester Blower air lines are in need of repair or replacement.	Near Term	$20000	Rates/Reserves/Borrow
Pump Station Improvement Recommendations					
P-1	Sunrise Pump Station	Upgrade pumps, telemetry, and replace electrical controls.	Immediate	$236,200	Rates/Reserves/Borrow
P-2	Upgrades to Pump Station No. 1	Replace piping and upgrade from bubbler system to ultrasonic pump controls for Pump Station No. 1	Long term	$100,000	Rates/Reserves/Borrow
*Notes: *Rates=monthly sewer rates, Sewer Fund 402; Reserves = Sewer Improvement Fund 408 that includes facilities charges & rates; Borrow = low interest loans from WA St Ecology, PWTF or bond sale.*					

The formula for prioritizing the improvements in terms of immediate, near and long term is a combination of need, cost-benefit, and importance to system integrity, and input from the City. The City, by using this plan as a tool, can optimally plan and implement improvements to best benefit the City.

The following sections discuss the definitions of immediate, near term and long-term improvements.

6.3.1 Immediate Improvements

Immediate improvements are defined as those improvements that should be completed as soon as possible. Immediate improvements generally are those that have high benefit compared to low cost, can be completed with minimal front-end costs (i.e., engineering), and require minimal budgeting by the City.

6.3.2 Near Term Improvements

The near term improvements are second tier improvements that include existing system remediation and expansion improvements that should be completed approximately by the end of the year 2021 as a part of the six-year CIP. Near-term improvements are generally those with high benefit to cost ratios that the City should instigate to improve the existing system or expand the service area.

6.3.3 Long Term Improvements

Long-term improvements are generally expansion improvements and associated existing system remediation improvements instigated by development demand or annexations and may or may not be instigated prior to 2034. The long-term improvements are summarized in Table 6-6, without a projected completion date.

CITY OF LANGLEY
PROPOSED SEWER SYSTEM IMPROVEMENTS
FIGURE 6-1

Operations and Repair Program
- Broken Pipe
- Debris
- HIgh Infiltration
- Protruding Lateral
- Roots
- Sagging

Legend
- Lift Station
- Manhole
- Outfall
- Force Main
- Low Pressure Sewer
- Urban Growth Boundary
- City Limits

Basin Boundaries
- (C) Central
- (E) East
- (W) West

CIP Projects
- Proposed Manhole (Possible Locations)
- P- Lift Station Rehabilitation
- LS- Lift Station Proposed
- WWTP- WWTP Improvements
- EX- Gravity Sewer Expansion Projects (Backbone)
- FM- Forcemain Expansion Project
- RR- Rehabilitation or Replacement Project

N W E S

0 150 300 600
Feet

Data Sources:
City of Langley, Island County, and PACE Engineers, Inc.

Map Print Date:March 2016

PUMP STATION NO. 1
PUMP STATION NO. 2
OUTFALL
LANGLEY CITY HALL
SUNRISE LIFT STATION
LS-1
LS-2
LS-3
LS-4
P-1
P-2
FM-1
FM-2
FM-3
FM-4
EX-1
EX-2
EX-3
EX-4
EX-5
EX-6
EX-7
EX-8
EX-9
EX-10
EX-11
RR-1
RR-2
RR-3
RR-4
RR-5
RR-6
RR-7
RR-8
RR-9
RR-10
RR-11
RR-12
RR-13
RR-14
WWTP-1-6
Urban Growth Area Boundary
CITY OF LANGLEY WASTEWATER TREATMENT PLANT
EXISTING STUB FOR FUTURE GRAVITY SEWER EXTENSION
INTERIM WOODSIDE LIFT STATION
SARATOGA PASSAGE
Saratoga Creek
Brookside Creek
Noble Creek
1ST ST
2ND ST
3RD ST
4TH ST
5TH ST
6TH ST
MCLEOD ALY
LOUISA ST
SARATOGA RD
BROOKS HILL RD
BRACKENWOOD AVE
STRAWBRIDGE LN
TOMPKINS RD
DE BRUYN AVE
COTTAGE LN
ANTHES AVE
CASCADE AVE
SUNRISE LN
WHARF ST
PARK AVE
ISLAND VIEW LN
GROOM LN
NOBLECLIFF PL
EDGECLIFF DR
CAMANO AVE
GLEASON LN
SUZANNE CT
PINEY KNOLL LN
AL ANDERSON AVE
LANGLEY RD
DECKER AVE
PURMAN AVE
WOODSONG LN
SANDY POINT RD
WOODSIDE LN
CANFIELD DR
CEDAR CIR
CEDAR ACRES LN
TALKING CIR
MAXWELTON RD
INGLEWOOD DR
COLES RD
NIGHTHAWK RD
120 ft

PACE

Document Path: J:\UtilityDistrictsAndCompanies\LangleySewerDistrict\GIS\ArcMapDoc\Chapter Figures\Figure 6-1 ProposedSewerSystem.mxd

Chapter 7: Financing & Implementation

This chapter summarizes the financial history of the sewer utility, describes the financial policies, capital funding sources and provides a financing plan for the capital improvements along with the impact on rates and fees. This chapter was prepared by Katy Isaksen & Associates.

7.1 SUMMARY OF FINANCIAL HISTORY

The City accounts for the self-supporting sewer utility in an operating fund and an improvement fund. Sewer Fund 402 is the operating fund that accounts for on-going operations, maintenance and administration of the sewer system. Sewer service fees are the primary source of revenue along with inspection/permits of new connections, septage receiving, compost/yard waste ticket sales and interest.

Table 7-1: Summary History of Sewer Operating Fund 402

Three-Year History	2013	2014	2015
Sewer Fund 402			
Sewer Services	285,772	309,533	334,337
Inspection/Permit Fees	400	12,823	550
Septage/Compost/Yard Waste	34,523	15,174	36,131
Misc. (Office Rental, misc.)	7,717	8,451	3,897
Interest Earned	557	748	532
Total Sewer Revenue	**328,969**	**346,729**	**375,447**
Sewer - Wages & Overtime	104,167	101,024	109,771
Sewer - Benefits	51,667	54,001	57,298
Uniforms	523	221	644
Supplies	16,515	11,075	19,375
Training/Travel	42	1,161	381
Utilities - Sewer	42,643	42,346	44,085
NPDES Permit Fees	1,841	1,616	1,619
Engineering	5,317	8,612	7,025
Fuel & Maintenance	3,256	2,410	1,917
Repairs & Maintenance	16,844	46,910	21,314
Equip/ Facility Improvements	-	139	-
Sewer Plant Testing	1,909	2,360	2,322
Composting/Yard Waste Program	16,613	6,986	7,786
Excise Tax	915	4,180	851
Excise Tax Main St Credit	6,759	3,453	6,750
Miscellaneous (misc, utility software)	2,252	3,465	3,058
Operating Transfer Out to Gen 001	73,894	60,124	72,487
Transfer to Vehicle Equip Reserve	7,000	7,000	7,000
Transfer Facility/Sewer Equip Reserve	5,000	5,000	5,000
Total Sewer Expenditures	**357,157**	**362,083**	**368,683**
Annual Increase/(Use) of Reserves	***(28,188)***	***(15,354)***	**6,764**

The 3-year financial history is summarized in Table 7-1. At the bottom, the Annual Increase/(Use) of Reserves line provides a quick view of whether the revenue was sufficient to meet the expenses in each year. If revenue exceeds expenses, then the reserves are increased, and if revenues do not meet expenditures, then the reserves are used to balance the year. The utility needed to dip into reserves in 2013 & 2014 to balance. The trend has been improving and in 2015 the revenues were to the positive. The 2015 ending fund balance is $107,000.

This is a substantial improvement over the previous plan history, where the ending balance was approximately $1,000 and transfers from the sewer improvement fund were required to balance the operating fund each year. This practice was not sustainable and has been corrected with rate adjustments over the period. A recommendation was for the City to establish and budget annual equipment reserve contributions for vehicle equipment, facility and sewer equipment reserve. The City continues to budget these each year however if there is not sufficient revenue, the transfers have not been made. Another recommendation was to establish a target minimum balance in the sewer fund of two months of operations for a cash flow reserve. The $107,000 exceeds the target minimum balance.

Table 7-2: Summary History of Sewer Improvement Fund 408

Three-Year History	2013	2014	2015
Sewer Expansion/Improvement Fund 408			
Interest Earned	374	341	407
ULID 8 Commercial Surcharge	17,779	15,677	25,155
Connection Fees	48,982	29,476	62,529
Transfer In/Capital Reserves	5,000	5,000	5,000
Total Sewer Improv. Revenue	**72,135**	**50,494**	**93,091**
SRF Loan Payment	9,327		-
Sewer Comp Plan Update	-	29,175	45,197
Miscellaneous		91	-
Sewer Expansion/Improvement	-	185	-
Sewer Capital Purchases & Repairs	-	456	78,134
Total Sewer Improv. Expenditures	**9,327**	**29,907**	**123,331**
Annual Increase/(Use) of Reserves	***62,808***	***20,587***	**(30,240)**
Beginning Balance			307,000
Ending Balance - Sewer Improv. 408			**277,000**
Target Minimum Emergency Reserve			100,000
Available for Improvements			***177,000***

The Sewer Expansion and Improvement Fund 408 provides for the expansion, capital improvements and debt of the sewer system. Table 7-2 indicates that the sewer improvement fund increased reserves in 2013-2014 as the debt ended. The 2015 ending fund balance was $277,000 after making capital repairs.

Revenue received from commercial surcharges, new connections in the form of charges in-lieu-of-assessment, special assessments and connection fees (general and local facilities charges) are deposited into this fund. In addition, revenue includes interest and a transfer from the sewer fund for

the capital reserves. The expenditures include debt repayment which ended in 2013 and capital repairs and improvements. This fund carries the primary reserves for the sewer utility.

In 2013 the loan for the sewer treatment plant was paid off and additional reserve requirements ended with the debt. The debt reserve was used to make the last payment as planned. The reserves/ending balance of $277,000 includes a $100,000 emergency reserve. This leaves $177,000 “available" for improvements.

The utility (at the end of 2015) provided sewer service to 448 properties (accounts), 334 residential, 112 commercial and 2 in the B&B classification. There has been some development activity in specific developments in recent years.

Overall, the sewer utility is in a better financial position than in past years. The focus now needs to be developing funding for ongoing capital repairs and replacement, as well as improvements. This can be done by increasing the number of customers, identifying additional funding sources for capital improvements, reducing expenses or increasing rates and charges. More consistent funding for ongoing maintenance leads to a reduction in emergency repairs, which are typically more costly.

7.2 OUTSTANDING DEBT

The sewer utility had one outstanding debt issue, a $5.2 million State Revolving Fund (SRF) loan from the Department of Ecology (Ecology) issued in 1992 for the secondary sewer treatment plant. The 20-year, zero interest loan was paid off in 2013. There is no outstanding debt for the sewer utility.

7.3 FUNDING PRIORITIES

Sewer service charges, or bimonthly rates, are the primary source of revenue for sewer maintenance, operations, administration, and capital improvements. For practical purposes, the sewer utility separates activity between the operating fund and improvement fund. The revenue is deposited into the fund where the primary expenditures are made.

There is a variety of other funding sources in the operating fund. These include septage receiving and compost sales, yard waste dump fees, inspection and permit fees for new connections, rental income on office space, interest earned and other miscellaneous revenue.

Capital-related revenue is deposited into the sewer improvement fund. Debt service was also included in this fund. The commercial surcharges from customers within ULID 8 are deposited into the improvement fund. Connection fees including general and local facilities charges, in-lieu-of assessment fees, and special assessments are also deposited for future capital improvements.

The sewer utility has budgeted to make contributions toward future equipment reserves but the transfers have not been made each year due to lack of funds. Public Works has an Equipment and Vehicle Reserve Fund 406 that is used to maintain and operate vehicles and equipment throughout the City. The sewer utility budgets transfers to the vehicle equipment reserve (406) and to the sewer improvement fund (408) for facility and sewer equipment reserve contributions. The six-year financial plan includes these reserve contributions from rates. Any surplus in fund 408 is maintained in the reserves for future sewer use.

7.4 CURRENT RATES AND CHARGES

7.4.1 Bimonthly Sewer Rates

The City bills customers for sewer service every two months. The rate structure has two elements, a base rate for up to 3,750 gallons of water and a volume rate based on additional metered water use. To capture the water entering the sewer, the residential summer bills are based on average winter use. The rates are reviewed and set each year in the City's fee resolution. The current 2016 sewer rates are shown in Table 7-3. In addition, the City sets rates for yard waste, compost, septage receiving and liquid bio-solids.

Table 7-3: Current Sewer Rates

Existing 2016 Rates	Monthly	Bimonthly	Description
Base Rates			
Residential	$30.08	$60.16	Use winter average for summer
Commercial	$30.08	$60.16	Year round
Bed & Breakfast	$30.08	$60.16	Up to 6000 gallons Mar-Oct
Alternative Holding Tank	$30.08	$60.16	
Volume Rate			**per gallon beyond base allowance**
Residential		$0.01475	base allowance = 3,750 gallons, use winter average for summer
Commercial		$0.01475	base allowance = 3,750 gallons
Bed & Breakfast		$0.01475	3750 gal Nov-Feb, 6000 gal Mar-Oct
ULID 8 Commercial Surcharges			
Base rate	$4.42	$8.84	
plus per gallon rate		$0.0016	

7.4.2 Sewer Connection Fees

Sewer connection fees are charged for each equivalent residential unit (ERU) connecting to the sewer system. All new or upsized connections pay a general facilities charge. Local facilities charges are paid by those connecting into an existing sewer main and have not otherwise paid through a developer extension, latecomer agreement or ULID. An in-lieu-of-assessment fee is required for new connections that have not yet been assessed. The current 2016 connection fees are shown in Table 7-4.

Table 7-4: Current Connection Fees

2016 Connection Fees	Per ERU	Description
General Facilities Charge (GFC)	$5,346.54	All new & upsized connections
Local Facilities Charge (LFC)	$11,943.31	City installed sewer mains
ULID #8 In-Lieu-Of-Assessment	$1,930.24	New connections not yet assessed

7.5 CAPITAL IMPROVEMENT FUNDING

7.5.1 Capital Funding Sources

The City has successfully used a variety of capital funding sources for sewer improvements in the past. These include a Department of Ecology Clean Water SRF loan, Utility Local Improvement District (ULID) assessments, commercial rate surcharges, connection fees, developer extensions, monthly rates and reserves. The City has been unsuccessful in their attempt to make use of the USDA Rural Development Program. While the size of the community and the projects were eligible, the median household income caused the City to be ineligible.

There are other sources of capital funding available for sewer. These include State grants and low-interest loans from the Department of Ecology for the Centennial Clean Water Fund and Clean Water SRF and the Department of Commerce for the Public Works Trust Fund (PWTF).

The PWTF loan program has been successfully used by the City for water. Unfortunately, this program is in flux in recent years due to the legislature redirecting the funds to other state uses such as education. The construction program requires that projects be ready to proceed and thus the loans must be drawn within 36 months of approval. This is a competitive program with an annual application cycle in May of each year, with funds being available the following year. The City can monitor to determine whether the program is open for applications each year, with the understanding that there is no certainty of funding. If successful, there are low-interest loans.

Ecology has an annual competitive cycle for combined water quality funding sources. The application cycle is typically in October of each year. Early planning is recommended, as Ecology requires certain approvals prior to application. The SRF loans would be available the following year at low interest. The City has had success with this program in the past for the wastewater treatment plant improvement. The median household income is not a barrier.

USDA Rural Development provides loans, grants and loan guarantees for sanitary sewer, drinking water, solid waste and storm drainage facilities in rural areas and cities or towns with population up to 10,000. These programs are open year-round however there is now a test for a low median household income that made the City ineligible.

Island County has an Economic Development grant program that is funded by $0.09 rural county sales tax. The City should contact Island County for more information on when applications may be accepted and the types of projects that may be eligible.

There is an infrastructure funding program database that is provided by the Infrastructure Assistance Coordinating Council (IACC). This can be accessed on the web directly at www.infrafunding.com or through the Public Works Board Website, www.pwb.wa.gov. This database is very helpful in determining which funding assistance programs may be available at the time the City is considering a project and how to contact the agencies.

7.5.2 Local Funding Sources

Monthly sewer rates can provide an on-going level of funds for planned capital repairs and improvements. This is appropriate for repair and replacement of the sewer system to serve existing customers. Connection fees are deposited into the Improvement Fund and are available for capital improvements.

The sewer utility is able to borrow from the above-mentioned financial assistance programs and any loans would need to be repaid by sewer rates and connection charges.

The sewer utility is also able to sell revenue bonds and/or general obligation bonds to fund planned system improvements. Revenue bonds would be repaid by sewer rates and connection fees. General obligation bonds could be repaid by sewer rates and charges or general city tax revenue. A levy lid lift could support the repayment of general obligation bonds or financial assistance program loans.

The cost of developer-funded projects is not addressed in this financial plan. The identified projects would be completed as necessary by developers in order to connect their property to the system.

7.5.3 Affordability

The financial assistance programs in the form or grants and/or low-interest loans consider the affordability of monthly sewer rates in determining the level of hardship for a community. The level of hardship can influence the financial assistance offer, such as amount of grant, interest rate on loans, etc. Hardship is most commonly linked to the median household income (MHI) of the community. For sewer, the Ecology SRF program defines hardship where sewer costs exceed 2.0% of MHI. If the rates are higher than 2.0% MHI, the community would be considered in hardship, would receive extra points on the application and be offered some portion of grant and/or a lower interest rate.

For Langley, the most recent Ecology water quality funding guidelines (SFY2017) show a MHI of $38,523. At 2.0% of MHI, typical residential sewer rates would be $64.21 per month, or $128.42 for a 2-month bill. A typical residence in Langley currently pays $100.72 per bimonthly bill for sewer (assumes 6500 gallons average winter water use). This level is considered non-hardship and would likely be offered a standard 20-year loan with interest of about 2.0% (is set each year at 60% of bond rate).

7.5.4 Capital Improvement Funding Plan

In the previous chapter, Table 6-8 identified recommended capital improvements of approximately $150,000 annually and $1.8 million in CIP projects over the next 20 years. The cost estimates were made in 2015 dollars and will need to be escalated in the financial plan. The projects were scheduled into one of three periods: immediate (6-year) $1,002,100, near term (10-year) $674,000 and long term (20-year) $100,000. The City does not have the level of sewer reserves on hand to fund these projects. In addition, the long term replacement of system components has not been included in this plan.

Table 7-5: Capital Improvement Program Summary

CIP Program	Annual	Immediate (6-Year)	Near Term (10-Year)	Long Term (20-Year)	Total
Collection System		$418,500	$589,000	not identified	$1,007,500
Ongoing Maintenance	$149,750				$149,750
Wastewater Treatment Facility		$347,400	$85,000	not identified	$432,400
Pump Stations		$236,200	$0	$100,000	$336,200
Totals	**$149,750**	**$1,002,100**	**$674,000**	**$100,000**	**$1,925,850**

Table 7-5 summarizes the CIP recommendations by system element and planning timeframe. The recommended annual program will need to be funded by rates for an on-going sustainable source of revenue. The CIP projects will be funded by a combination of rates, reserves and connection charges collected from new connections to the sewer system. Borrowing may be considered where appropriate and would be repaid by rates and connection charges.

7.6 SIX-YEAR CAPITAL IMPROVEMENT FUNDING

The six-year CIP will include the immediate projects ($1,002,100) along with the annual ongoing maintenance ($149,750). Together, the average cost over six years would be $316,800 per year (2015 dollars) and escalated each year for inflation. This level of funding for the sewer CIP would cause a significant impact on rates.

In order to develop a scenario that would be more affordable, the CIP elements were reviewed to determine whether there were opportunities to step up the funding over several years or whether there were candidate projects for potential borrowing that would minimize the impact on rates.

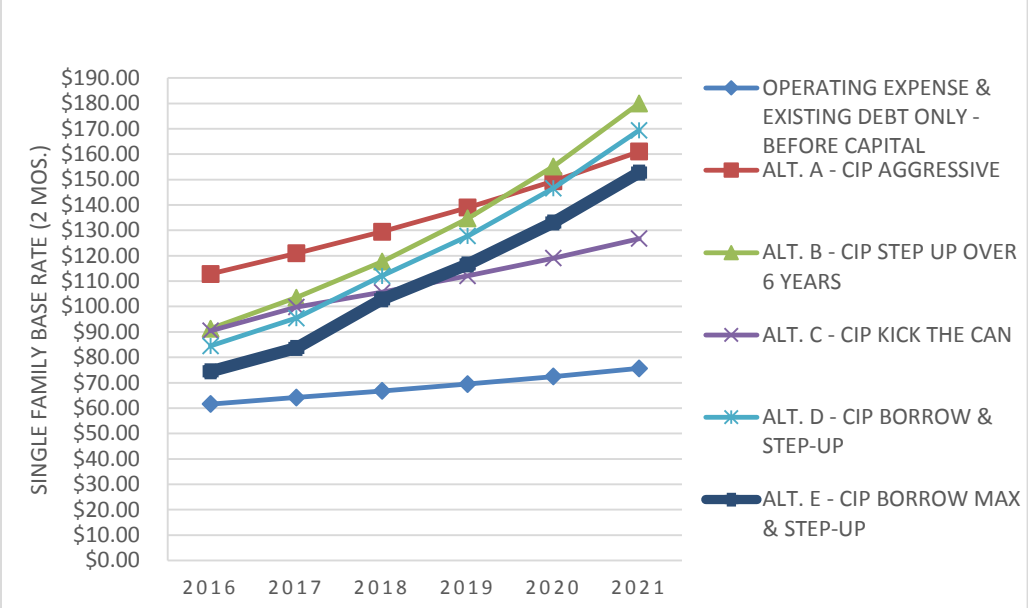
- The collection system improvements are a series of known problems with the sewer lines, such as protruding laterals or roots, high infiltration or broken and sagging lines. This is best funded by rates on an ongoing basis where staff would focus on the highest priority projects within the budget for the year. Reserves can be used to complete higher priority projects sooner if needed. The reserves should be rebuilt to be available again in the future.

- The ongoing maintenance would fund a list of recommended annual maintenance and repairs each year. This is best funded with rates for an ongoing sustainable program. While it would be nice to have this level immediately, it is more reasonable to step into this level over six-years.

- The wastewater treatment facility and pump station improvements are best funded using reserves that have built up from new connections and annual transfers from rates for facilities and equipment replacement. These are also candidates for potential borrowing from Ecology's SRF low-interest loan program. Any debt would be repaid by rates and connection charges.

Several CIP funding scenarios were developed to demonstrate how the City could have a series of rate increases and potential borrowing to build up to funding the program over six-years. The scenarios included A. Aggressive – funded average annual amount in the first year, B. Step-Up Over 6 Years – reduced the impact on rates by stepping up over six-years, C. Kick-the-Can – kept the reduced maintenance level of $20,000 in 2016 and went back to $35,000 in 2017+, and D. Step-Up and Borrow – moderates the impacts on rates and builds the program over six-year to the recommended level.

Figure 7-1: Scenarios - Impact on 2-month base rate



After the Council workshop, the preferred scenario was developed, Alt. E – Borrow Max & Step-Up. The thinking was that if the City were to borrow, which projects would be reasonable candidates within the 6-year CIP? This scenario borrows $583,600 for the WWTP and pump station projects and steps-up the annual maintenance program over six-years. It provides the highest CIP benefit for the lowest rates.

Table 7-6 summarizes the preferred CIP funding scenario. The costs have been escalated at 4.0% per year. This scenario will result in new debt payments estimated to be $35,700 per year for 20 years at 2.0% interest.

Table 7-6: Preferred CIP Funding Scenario

E. BORROW MAX & STEP-UP		2016	2017	2018	2019	2020	2021
Step up recommended annual		$5,000	$30,000	$55,000	$80,000	$105,000	$130,000
SRF Loan for Sunrise PS & WWTP	$583,600						
+ remaining 6-yr. improvements		$69,800	$69,800	$69,800	$69,800	$69,800	$69,800
Subtotal – Unescalated		$74,800	$99,800	$124,800	$149,800	$174,800	$199,800
Subtotal - Escalated at 4.0% year		$74,800	$103,800	$135,000	$168,500	$204,500	$243,100
Estimated debt payment (20yr, 2%)				$35,700	$35,700	$35,700	$35,700
Subtotal - Escalated & New Debt		$74,800	$103,800	$170,700	$204,200	$240,200	$278,800

The Council also discussed the potential for a levy-lid lift as another alternative for repaying the debt without further impacting sewer rates. This scenario has not been developed.

The five scenario summaries are shown at the end of the chapter in Table 7-12.

7.7 SUMMARY OF SEWER OPERATING FUND OUTLOOK

The Sewer Operating Fund projections are summarized in Table 7-7 before including any CIP funding. The rates will need to be adjusted by 2% in 2016 and about 4-5% each year through 2021. If the rates are not adjusted, the ending fund balance would be eliminated by 2019.

Table 7-7: Sewer Operating Fund Outlook – Before CIP

Sewer Operating Fund - 402	2016	2017	2018	2019	2020	2021
Sewer Services	348,102	349,915	351,728	353,541	355,354	357,167
Other Sewer Revenue	37,511	37,411	37,411	37,411	37,411	37,411
Est. Sewer Revenue	**385,613**	**387,326**	**389,139**	**390,952**	**392,765**	**394,578**
Est. Sewer Expenditures	**393,709**	**410,191**	**426,249**	**442,872**	**460,078**	**477,892**
Annual Increase/(Use) of Reserves	***(8,096)***	***(22,865)***	***(37,110)***	***(51,920)***	***(67,313)***	***(83,314)***
Cumulative% of Sewer Rate	***2%***	***7%***	***11%***	***15%***	***19%***	***23%***
Estimated Ending Balance 402	**98,904**	**76,039**	**38,929**	**(12,991)**	**(80,304)**	**(163,618)**
Target Minimum Operating Reserve	65,618	68,365	71,042	73,812	76,680	79,649
Meets Target Minimum?	*ok*	*ok*	*warning*	*warning*	*warning*	*warning*

This summary includes two sufficiency tests -annual and bottom line fund balance. The annual test compares revenue (with existing rates) and expenditures to determine whether the utility is increasing or decreasing its reserves in each year. If the Annual Increase/(Use) of Reserves is negative, then the utility will be decreasing or using reserves to balance the annual budget. The summary operating outlook anticipates a reduction in reserves in each year 2016 -2021 – before CIP is included in the model.

The Cumulative Percent of Sewer Rates indicates the cumulative increase in rates necessary to balance the operating revenue and expenditures before CIP. Table 7-7 demonstrates a 2% rate increase would be necessary to balance 2016, and additional 5% for 2017 and so on for operations without a CIP program.

The second test tracks the bottom line fund balance to ensure that it is not projected to fall below the target minimum. A warning shows if the fund balance drops below the target minimum. The target minimum operating fund balance is equal to two months of operating expenses. This is about $65,000 for 2015 and increases to about $80,000 for 2021.

The full six-year outlook is shown at the end in Table 7-10 and includes both operations and the preferred CIP scenario.

7.8 IMPACT ON BIMONTHLY SEWER RATES

The combined impact on bimonthly sewer rates is shown in Table 7-8. Based on the sewer operating outlook above and including the preferred CIP funding scenario, the bimonthly sewer rates would be adjusted as shown in Table 7-8 to result in a balanced financial plan. The impact on the average single family customer is shown, using 6,500 gallons per month (average winter water use).

Table 7-8: Estimated Impact On Rates (Operating & CIP)

ALT. E=CIP BORROW MAX & STEP-UP	2016	2017	2018	2019	2020	2021	Gallons
Estimated Impact on Rates	*24%*	*12%*	*23%*	*13%*	*14%*	*15%*	
Base Rate for 2 months	$74.49	$83.71	$102.87	$116.61	$133.05	$152.80	
Gallons included in Base Rate	3,750	3,750	3,750	3,750	3,750	3,750	
Volume Rate per 100 gal.	$1.83	$2.05	$2.52	$2.86	$3.26	$3.75	
Average SF Residence (2-Months)	**$124.71**	**$140.15**	**$172.23**	**$195.24**	**$222.76**	**$255.83**	**6,500**
Increase in Average Single Family	*$23.99*	*$15.45*	*$32.07*	*$23.01*	*$27.52*	*$33.07*	

The annual funding of capital maintenance and repairs is critical to the long-term health and sustainability of the sewer system. As the annual amount is stepped-up over the six years, the number of emergency repairs will be reduced and the utility can operate at a more efficient level.

Additional steps recommended for the future.

- The estimated impact on rates assumes that both the base and volume rates would be adjusted by the same percentage. The result is that all customers would realize the same percentage increase. It appears that in recent years, the volume rates have not been increased by the same percentage as the base rate.
- Include an Asset or System Replacement component in the rates -The sewer projections do not include a specific element of depreciation or capital replacement of the sewer plant (mains, treatment plant, etc.) within the bimonthly rates. The City should consider adding this element as the number of ratepayers increase to avoid future drastic impacts on rates.
- Update the general and local facilities charges based on the CIP in this plan.

7.9 SIX-YEAR FINANCIAL PLAN

The six-year plan is was developed based on the 2016 budget, several adjustments were made and future year revenue and expenses were projected using key assumptions. Attempts were made to be conservative in the projections (lower on revenues and higher on expenses) to avoid results that are not achievable. The sewer operating fund 402 is shown in Table 7-10 and the sewer improvement fund 408 is shown in Table 7-11.

7.9.1 Key Assumptions

The key assumptions used in the six-year projections are shown in Table 7-9. These include the number of new customers per year and three cost escalation factors.

Table 7-9: Key Assumptions

New Customer ERUs	3
Wage/Benefit Escalation	4.0%
Annual Cost Escalation	3.5%
Construction Cost Escalation	4.0%

7.9.2 Sewer Revenue Fund 402

In Table 7-10, the sewer service charges are estimated using existing 2016 rates for the six-year period. This allows the model to calculate the impact on existing rates to have a balanced program. An additional $20,000 has been included for commercial accounts for a billing system correction. New customers (3 per year) are added for six-months in the first year. Other revenue (septage, yard waste, etc.) is held flat throughout the six-year outlook.

7.9.3 Sewer Fund Expenditures 402

The operating expenses are generally projected to increase by cost escalation. Wages, overtime and benefits are escalated at 4.0% per year. Other costs are escalated at 3.5% per year. Transfers for sewer equipment and facilities reserves are stepped-up by $500 in each year to increase the funding with minimal impact on rates. The preferred CIP funding scenario E has been included.

The six-year plan shows an Annual Use of Sewer Reserves in each of the years (near the bottom of Table 7-10. This must be addressed either by reducing expenses or increasing rates and/or fees. The estimated impact on rates in Table 7-8 would correct the deficiencies.

The Percent (%) of Sewer Service Rates indicates that bimonthly rates would be required to increase 2% for 2016, a cumulative 7% for 2017 and so on to avoid using reserves to balance each year for operations alone before including the CIP. The combined impact with operations and preferred CIP funding scenario E would require a 40% increase in 2016 over existing rates, a cumulative 53% in 2017 and so on. Table 7-10 shows the detailed six-year plan for the sewer fund.

7.9.4 Sewer Fund 402 Reserves

A target minimum operating reserve equal to two months of operating expenses is set aside in the fund balance.

7.9.5 Sewer Improvement Fund 408 Revenue

Table 7-11 shows the sewer improvement fund outlook with existing revenue. The connection fees reflect the 2016 budget and include general facilities charges for new connections going forward. The commercial surcharge continues at the budgeted level. A transfer from sewer

rates (Fund 402) is made each year for the sewer equipment and facilities reserve contributions.

7.9.6 Sewer Improvement Expenditures

The sewer improvement expenditures include existing outlook for capital improvements. There is no longer any existing debt. Capital purchases and repairs is budgeted for $161,000 in 2016 and has been reduced to $35,000 as a more typical program level. This is assumed to continue and would include the rate portion of the CIP.

7.9.7 Sewer Improvement Reserves

The sewer improvement reserve set-aside has been simplified after the SRF loan was paid off. An emergency reserve of $100,000 is assumed to be set aside and not available for planned capital improvements. The amount "Available for Improvements" is shown after the target minimum emergency reserve has been subtracted.

Table 7-11 shows the improvement outlook at a baseline before consideration of the recommended CIP and preferred CIP funding scenario. It indicates that approximately $50,000 is available for unscheduled capital repairs.

7.9.8 CIP Funding Scenarios

Table 7-12 summarizes the CIP funding scenarios that were developed and considered in the financial analysis. The top portion shows the program costs and the bottom portion shows the impact on rates to fund each scenario.

Table 7-10: Sewer Operating Fund							
Sewer Financial Outlook	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Comments**
Sewer Fund Revenue - 402							
Sewer Services	348,102	349,915	351,728	353,541	355,354	357,167	new ERU @ 6 mos
Inspection/Permit Fees	400	300	300	300	300	300	$100 per permit
Septage/Compost	17,000	17,000	17,000	17,000	17,000	17,000	flat
Yard Waste	11,668	11,668	11,668	11,668	11,668	11,668	flat
Office Rental	7,597	7,597	7,597	7,597	7,597	7,597	flat
Interest Earned	746	746	746	746	746	746	flat
Misc. Revenues	100	100	100	100	100	100	flat
Total Sewer Revenue	**385,613**	**387,326**	**389,139**	**390,952**	**392,765**	**394,578**	
Sewer Fund Expenditures - 402							
Sewer Wages & Overtime	116,445	121,103	125,947	130,985	136,224	141,673	by wage/benefit escal.
Sewer Benefits	58,935	61,292	63,744	66,294	68,946	71,703	by wage/benefit escal.
Supplies	20,000	20,700	21,425	22,174	22,950	23,754	by cost escal.
Training/Travel	1,000	1,035	1,071	1,109	1,148	1,188	by cost escal.
Utilities-Sewer	46,150	47,765	49,437	51,167	52,958	54,812	by cost escal.
NPDES Permit	2,000	2,070	2,142	2,217	2,295	2,375	by cost escal.
Uniforms	500	518	536	554	574	594	by cost escal.
Excise Tax	6,092	6,305	6,526	6,754	6,991	7,235	by cost escal.
Engineering	12,500	12,938	13,390	13,859	14,344	14,846	by cost escal.
Fuel & Maintenance	9,600	9,936	10,284	10,644	11,016	11,402	by cost escal.
Repairs & Maintenance	20,000	20,700	21,425	22,174	22,950	23,754	by cost escal.
Equip/ Facility Improvements	-	-	-	-	-	-	
Sewer Plant Testing	4,000	4,140	4,285	4,435	4,590	4,751	by cost escal.
Composting/Yard Waste Program	10,000	10,350	10,712	11,087	11,475	11,877	by cost escal.
Miscellaneous	2,000	2,070	2,142	2,217	2,295	2,375	by cost escal.
Utility Software	-	1,000	1,035	1,071	1,109	1,148	by cost escal.
Operating Transfer Out to Gen 001	72,487	75,024	77,650	80,368	83,180	86,092	by cost escal.
Transfer Out/Vehicle Equip Reserve	7,000	7,245	7,499	7,761	8,033	8,314	by cost escal.
Transfer Out/Facility Reserve	2,500	3,000	3,500	4,000	4,500	5,000	ramp up each year
Transfer Out/Sewer Equip Reserve	2,500	3,000	3,500	4,000	4,500	5,000	ramp up each year
Transfer to 408 - CIP Improvements	**74,800**	**103,800**	**170,700**	**204,200**	**240,200**	**278,800**	**Preferred CIP Scen. E.**
Total Sewer Expenditures	**468,509**	**513,991**	**596,949**	**647,072**	**700,278**	**756,692**	
Annual Increase/(Use) of Reserves	***(82,896)***	***(126,665)***	***(207,810)***	***(256,120)***	***(307,513)***	***(362,114)***	
% of Sewer Service Rates	***24%***	***36%***	***59%***	***72%***	***87%***	***101%***	***Cumulative Increase***
Sewer Fund 402 Balance							
Beginning Balance	**107,000**	24,104	(102,561)	(310,371)	(566,491)	(874,004)	Beg 2016 = Est. End 2015
Annual Increase/(Use) of Reserves	*(82,896)*	*(126,665)*	*(207,810)*	*(256,120)*	*(307,513)*	*(362,114)*	
Estimated Ending Balance 402	**24,104**	**(102,561)**	**(310,371)**	**(566,491)**	**(874,004)**	**(1,236,118)**	
Target Minimum Operating Reserve	78,085	85,665	99,492	107,845	116,713	126,115	2 months oper exp
Meets Target Minimum?	*warning*	*warning*	*warning*	*warning*	*warning*	*warning*	

Table 7-11: Sewer Improvement Fund							
Sewer Financial Outlook	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Comments**
			2016 GFC = $5,346.54, LFC = $11,943.31				Connect. Fee (GFC)
Swr Expan/Improv Fund Revenue - 408							5,347
Interest Earned	363	3,750	3,919	4,082	4,238	4,385	2.5% on reserves
ULID 8 Comm'l Surcharge	15,966	15,966	15,966	15,966	15,966	15,966	flat
Connection Fees	46,532	16,041	16,041	16,041	16,041	16,041	GFC x new cust
Transfer In/Capital Reserves	5,000	6,000	7,000	8,000	9,000	10,000	fr 402 facil/equip reserv
Total Expan/Improv Revenue	**67,861**	**41,757**	**42,926**	**44,089**	**45,245**	**46,392**	
Swr Expan/Improv Fund Expenditure - 408							
Miscellaneous	-						
Sewer Expansion/Improvement	-						
Sewer Capital Purchases & Repairs	161,000	35,000	36,400	37,856	39,370	40,945	
Transfer to Sewer Fund 402							
Total Expan/Improv Expenditures	**161,000**	**35,000**	**36,400**	**37,856**	**39,370**	**40,945**	
Annual Increase/(Use) of Reserves	***(93,139)***	***6,757***	***6,526***	***6,233***	***5,875***	***5,447***	
Sewer Expan/Improv Balance							
Beginning Balance 408	243,141	150,002	156,759	163,285	169,518	175,393	2016 budget
Annual Increase/(Use) of Reserves	*(93,139)*	*6,757*	*6,526*	*6,233*	*5,875*	*5,447*	
Estimated Ending Balance 408	**150,002**	**156,759**	**163,285**	**169,518**	**175,393**	**180,840**	
Target Minimum Emergency Reserve	100,000	100,000	100,000	100,000	100,000	100,000	
Available for Improvements	**50,002**	**56,759**	**63,285**	**69,518**	**75,393**	**80,840**	
Meets Target Minimum?	*ok*	*ok*	*ok*	*ok*	*ok*	*ok*	

Note that this Improvement Fund outlook is before the CIP program is funded and accomplished.

Table 7-12: CIP Funding Scenarios

CIP FUNDING SCENARIOS			2016	2017	2018	2019	2020	2021
A. AGGRESSIVE	Includes full recommended annual		$129,800	$129,800	$129,800	$129,800	$129,800	$129,800
	+ average six-year improvements		$167,000	$167,000	$167,000	$167,000	$167,000	$167,000
	Subtotal - Unescalated		$296,800	$296,800	$296,800	$296,800	$296,800	$296,800
	Subtotal - Escalated*		**$296,800**	**$308,700**	**$321,000**	**$333,900**	**$347,200**	**$361,100**
B. STEP UP OVER 6 YRS	step up recommended annual over 6 years		$5,000	$30,000	$55,000	$80,000	$105,000	$130,000
	+ average six-year improvements		$167,000	$167,000	$167,000	$167,000	$167,000	$167,000
	Subtotal - Unescalated		$172,000	$197,000	$222,000	$247,000	$272,000	$297,000
	Subtotal - Escalated*		**$172,000**	**$204,900**	**$240,100**	**$277,800**	**$318,200**	**$361,300**
C. KICK THE CAN	Keep 2015 level of Maint. & Repairs		$0	$15,000	$15,000	$15,000	$15,000	$15,000
	+ average six-year improvements		$167,000	$167,000	$167,000	$167,000	$167,000	$167,000
	Subtotal - Unescalated		$167,000	$182,000	$182,000	$182,000	$182,000	$182,000
	Subtotal - Escalated*		**$167,000**	**$189,300**	**$196,900**	**$204,700**	**$212,900**	**$221,400**
D. BORROW & STEP-UP	step up recommended annual over 6 years		$5,000	$30,000	$55,000	$80,000	$105,000	$130,000
	Ecology SRF Loan for Sunrise PS	$236,200						
	+ remaining six-year improvements		$127,700	$127,700	$127,700	$127,700	$127,700	$127,700
	Subtotal - Unescalated		$132,700	$157,700	$182,700	$207,700	$232,700	$257,700
	Subtotal - Escalated*		**$132,700**	**$164,000**	**$197,600**	**$233,600**	**$272,200**	**$313,500**
	Estimated debt repayment 20-yr, 2.0%				$14,400	$14,400	$14,400	$14,400
	Subtotal - Escalated & New Debt		**$132,700**	**$164,000**	**$212,000**	**$248,000**	**$286,600**	**$327,900**
E. BORROW MAX & STEP-UP	step up recommended annual over 6 years		$5,000	$30,000	$55,000	$80,000	$105,000	$130,000
	Ecology SRF Loan for Sunrise PS & WWTP	$583,600						
	+ remaining six-year improvements		$69,800	$69,800	$69,800	$69,800	$69,800	$69,800
	Subtotal - Unescalated		$74,800	$99,800	$124,800	$149,800	$174,800	$199,800
	Subtotal - Escalated*		**$74,800**	**$103,800**	**$135,000**	**$168,500**	**$204,500**	**$243,100**
	Estimated debt repayment 20-yr, 2.0%				$35,700	$35,700	$35,700	$35,700
	Subtotal - Escalated & New Debt		**$74,800**	**$103,800**	**$170,700**	**$204,200**	**$240,200**	**$278,800**

IMPACT ON RATES - SCENARIOS							
OPERATING EXPENSE & EXISTING DEBT ONLY - BEFORE CAPITAL							
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**@ 6,500 Gallons**
Estimated Impact on Rates	*2%*	*4%*	*4%*	*4%*	*4%*	*4%*	
Base Rate for 2 months	$61.56	$64.15	$66.73	$69.49	$72.44	$75.62	
Average SF Residence (2-Months)	**$103.06**	**$107.40**	**$111.72**	**$116.34**	**$121.29**	**$126.60**	
Increase in Average Single Family	***$2.34***	***$4.34***	***$4.31***	***$4.62***	***$4.95***	***$5.32***	
ALT. A - CIP AGGRESSIVE							
Estimated Impact on Rates	*88%*	*7%*	*7%*	*7%*	*8%*	*8%*	
Base Rate for 2 months	$112.85	$120.94	$129.48	$138.95	$149.40	$161.02	
Average SF Residence (2-Months)	**$188.94**	**$202.49**	**$216.78**	**$232.64**	**$250.13**	**$269.59**	
Increase in Average Single Family	***$88.22***	***$13.54***	***$14.29***	***$15.86***	***$17.49***	***$19.46***	
ALT. B - CIP STEP UP OVER 6 YEARS							
Estimated Impact on Rates	*52%*	*13%*	*14%*	*14%*	*15%*	*16%*	
Base Rate for 2 months	$91.28	$103.48	$117.68	$134.68	$155.18	$180.01	
Average SF Residence (2-Months)	**$152.83**	**$173.24**	**$197.02**	**$225.48**	**$259.81**	**$301.37**	
Increase in Average Single Family	***$52.11***	***$20.41***	***$23.77***	***$28.47***	***$34.33***	***$41.56***	
ALT. C - CIP KICK THE CAN							
Estimated Impact on Rates	*50%*	*10%*	*6%*	*6%*	*6%*	*6%*	
Base Rate for 2 months	$90.42	$99.76	$105.65	$112.04	$119.07	$126.76	
Average SF Residence (2-Months)	**$151.39**	**$167.03**	**$176.88**	**$187.59**	**$199.35**	**$212.23**	
Increase in Average Single Family	***$50.66***	***$15.64***	***$9.85***	***$10.71***	***$11.76***	***$12.88***	
ALT. D - CIP BORROW & STEP-UP							
Estimated Impact on Rates	*40%*	*13%*	*17%*	*14%*	*15%*	*16%*	
Base Rate for 2 months	$84.49	$95.44	$112.07	$127.77	$146.63	$169.41	
Average SF Residence (2-Months)	**$141.46**	**$159.79**	**$187.63**	**$213.91**	**$245.49**	**$283.63**	
Increase in Average Single Family	***$40.74***	***$18.33***	***$27.84***	***$26.28***	***$31.58***	***$38.14***	
ALT. E - CIP BORROW MAX & STEP-UP							
Estimated Impact on Rates	*24%*	*12%*	*23%*	*13%*	*14%*	*15%*	
Base Rate for 2 months	$74.49	$83.71	$102.87	$116.61	$133.05	$152.80	
Average SF Residence (2-Months)	**$124.71**	**$140.15**	**$172.23**	**$195.24**	**$222.76**	**$255.83**	
Increase in Average Single Family	***$23.99***	***$15.45***	***$32.07***	***$23.01***	***$27.52***	***$33.07***	

Appendix A

SEPA Documentation

City of Langley
2014 Comprehensive Sewer System Plan
SEPA Environmental Checklist

A. BACKGROUND

1. Name of proposed project, if applicable:
   City of Langley Comprehensive Sewer System Plan

2. Name of applicant:
   City of Langley

3. Address and phone number of applicant and contact person:

Applicant:	Contact Person:
Stan Berryman	*Susan Boyd*
Director of Public Works	*Vice President*
City of Langley	*PACE Engineers, Inc.*
PO Box 366 112 Second Street	*11255 Kirkland Avenue, Suite 300*
Langley, WA 98260	*Kirkland, WA 98033*
(360) 221-4246	*(425) 827-2014*

4. Date checklist prepared:
   May 21, 2015

5. Agency requesting checklist:
   City of Langley

6. Proposed timing or schedule (including phasing, if applicable):
   The updated Sewer System Plan is expected to be approved in 2015. The Plan horizon extends over 20 years, beginning in 2014.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.
   The Comprehensive Sewer Plan outlines future additions and expansions to provide acceptable levels of service. On a case-by-case basis, SEPA compliance may be required for individual projects.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
   2013 City of Langley Comprehensive Plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.
   None known.

10. List any government approvals or permits that will be needed for your proposal, if known.
    The City of Langley and State Department of Ecology will approve the Comprehensive Sewer Plan. Individual projects recommended in the plan may require city, state or federal permits on a case-by-case basis.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to

describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The City of Langley 2014 Comprehensive Sewer Plan, a non-project action, is a comprehensive long-range plan which serves as a guide for the development of sanitary sewer system within the Langley Sewer Service Area and Urban Growth Area (UGA) to the year 2034. The Plan would comply with the previsions of the City's National Pollutant Elimination Discharge System (NPDES) permit. The Plan is written to be consistent with requirements of the State Growth Management Act and the County Joint Planning Area.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

    Langley is located in Island County on the eastern shore of Whidbey Island facing Saratoga Passage, which is the channel between Whidbey and Camano Island. Langley is the only incorporated city in the southern portion of Whidbey Island. A Vicinity Map is enclosed.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site
   (circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____
   Varies on location

b. What is the steepest slope on the site (approximate percent slope)?
   The steepest slopes approach 90% along portions of the City's waterfront.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.
   The soils in Island County and the Langley are originated largely from glacial drift. The two main types of soil in the city are keystone Loamy Sand and Norma Silt Loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.
   There are unstable bluffs along Saratoga passage.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.
   The types and source of fill will be determined for individual projects during the design phase.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Does not apply; clearing and construction are not proposed as part of the Sewer System Plan updates.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Updates to the Sewer System Plan will not result in a change to impervious surfaces within the City's sewer service area.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Does not apply; updates to the Sewer System Plan will not result in erosion or impacts to the earth.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

None as a result of the Sewer System Plan updates.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Does not apply; updates to the Sewer System Plan would not result in air quality impacts.

3. Water

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes. Puget Sound (Saratoga Passage).

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Updates to the Sewer System Plan would not require construction over, in or adjacent to any known waterbodies.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None as a result of the Sewer System Plan update.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Not applicable.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.
No.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.
No.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.
None.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.
None as a result of the Sewer System Plan updates.

2) Could waste materials enter ground or surface waters? If so, generally describe.
None as a result of the Sewer System Plan updates.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.
Updates to the sewer system would not affect drainage patterns within the city.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:
None are proposed; updates to the Sewer System Plan would not result in impacts to surface, ground or runoff water.

4. Plants

a. Check the types of vegetation found on the site:

_X__ deciduous tree: alder, maple, aspen, other
_X__ evergreen tree: fir, cedar, pine, other
_X__ shrubs
_X__ grass
_X__ pasture
____ crop or grain
____ orchards, vineyards or other permanent crops.
_X__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
_X__ water plants: water lily, eelgrass, milfoil, other
_X__ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?
No vegetation would be removed as a result of the Sewer System Plan updates.

c. List threatened and endangered species known to be on or near the site.

There are no known listed plant species within the City's sewer service area.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Does not apply; updates to the Sewer System Plan will not impact vegetation within the service area.

e. List all noxious weeds and invasive species known to be on or near the site.

The Washington State Noxious Weed Control Board lists several plant species, such as Scotch Broom and Thistle, within Western Washington that may occur within the City's sewer service area.

5. Animals

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include:

birds: hawk, **heron**, **eagle**, **songbirds**, other: **waterfowl, quail, horned owl**
mammals: **deer**, bear, elk, beaver, other: **rabbits, raccoons, coyotes, otters**
fish: bass, **salmon**, trout, herring, **shellfish**, other:

b. List any threatened and endangered species known to be on or near the site.

There are no known listed threatened or endangered species within the City's sewer service area. The bald eagle is listed as a Federal Species of Concern and a Washington State Sensitive species.

c. Is the site part of a migration route? If so, explain.

Bald eagles are observed regularly in the vicinity of Langley.

d. Proposed measures to preserve or enhance wildlife, if any:

Saratoga Passage is part of a salmonid migratory route.

e. List any invasive animal species known to be on or near the site.

The Washington Department of Fish and Wildlife lists several prohibited, regulated, and unlisted species, such as tree frogs, that may occur within Western Washington and the City's sewer service area.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Operation of the City's sewer system will require the use of electricity, water, and other fuel sources for the operation and maintenance of the system.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Updates to the City's Sewer System Plan would not affect energy resources.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.

Chlorine gas is used for disinfection of effluent at the City's Wastewater Treatment Facility.

1) Describe any known or possible contamination at the site from present or past uses.

None.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are no hazardous chemicals/conditions that would affect updates to the City's Sewer System Plan. Underground transmission lines within the City's service area that could affect future sewer system design would be addressed during the design phase of future sewer system projects.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

None.

4) Describe special emergency services that might be required.

Updates to the City's Sewer System Plan would not require special emergency services.

5) Proposed measures to reduce or control environmental health hazards, if any:

Updates to the City's Sewer System Plan would not require measures to control environmental health hazards.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

None.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

None as a result of the Sewer System Plan updates.

3) Proposed measures to reduce or control noise impacts, if any:

Does not apply; updates to the City's Sewer System Plan would not produce noise impacts.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The land uses are residential and commercial as described in the City's Comprehensive Plan (2013). Extension of the City's sewer system could affect development within the City's service area.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

Much of the residential land use was previously agricultural. Rural land uses are still agricultural. None of the existing agricultural or forest land will be converted to other uses as part of the Sewer System Plan updates.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

Updates to the City's Sewer System Plan would not be affected by surrounding working farms or forest lands.

c. Describe any structures on the site.

N/A

d. Will any structures be demolished? If so, what?

N/A

e. What is the current zoning classification of the site?

N/A

f. What is the current comprehensive plan designation of the site?

N/A

g. If applicable, what is the current shoreline master program designation of the site?

N/A

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Yes, various areas in the City UGA are classified as environmental sensitive and ar classified in the City Critical Areas Ordinance.

i. Approximately how many people would reside or work in the completed project?

N/A

j. Approximately how many people would the completed project displace?

N/A

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The Plan incorporates elements of the City's adopted Comprehensive Plan (2013).

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

Updates to the City's Sewer System Plan would incorporate elements of the Critical Areas and Natural Resource policies in the City's adopted Comprehensive Plan (2013).

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.
None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.
None.

c. Proposed measures to reduce or control housing impacts, if any:
N/A

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?
Does not apply; structures are not proposed as part of the Sewer System Plan update. The Plan represents only a listing of proposed sewer system projects and does not attempt to identify specific design criteria. Generally speaking, most of the facilities that comprise the City's sewer system are underground pipes. The City does have some existing and proposed above-ground facilities, such as pump stations and treatment facilities.

b. What views in the immediate vicinity would be altered or obstructed?
None as a result of the Sewer System Plan update.

c. Proposed measures to reduce or control aesthetic impacts, if any:
Does not apply; updates to the City's Sewer System Plan would no impact aesthetics.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?
None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?
No.

c. What existing off-site sources of light or glare may affect your proposal?
None.

d. Proposed measures to reduce or control light and glare impacts, if any:
Does not apply; updates to the City's Sewer System Plan would not produce light or glare.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Fishing, boating, beach access, and biking.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Updates to the City's Sewer System Plan would have no effect on existing recreations uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Does not apply; updates to the City's Sewer System Plan would have no effect on recreational opportunities.

13. Historic and Cultural Preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

According to the Washington Information System for Architectural and Archaeological Records Data (WISAARD) website, there are three sites within the City of Langley that are officially designated historic register properties:

- *The Jacobs Anthes Bunkhouse*
- *The Olympic Club*
- *The Island County Fairgrounds – Pole Building*

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

None known.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Does not apply to this proposal. Assessment of potential impacts to cultural and historic resources would take place on a project basis.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

Does not apply to this proposal.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

SR 20/SR 525, the major highway serving Island County, is about 3 miles west of Langley. Connections to SR 525 include Langley Road, Maxwelton Road, Coles Road and Brooks Hill Road.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

Yes. Island Transit provides service to Langley.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

None.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

Sewer extensions may occur along road right-of-way, but will be addressed on a case-by-case basis.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

None.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

h. Proposed measures to reduce or control transportation impacts, if any:

Does not apply; updates to the City's Sewer System Plan would not impact transportation.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Updates to the Sewer System Plan would not require additional public services. However, updates to the City's sewer system could result in increased development within the service area, which may require additional services, and would be addressed on a project basis.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Does not apply to this proposal.

16. Utilities

a. Circle utilities currently available at the site:

Electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, Other:

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

The Comprehensive Sewer Plan prosed improvements to the sewer system by the City to serve the needs of the City through 2034.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of Signee: _____

Position and Agency / Organization: _____

Date Submitted:_____

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent of the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?
   The Plan itself will not result in any of the increases noted above. Individual projects will be evaluated on a case-by-case basis.

   Proposed measures to avoid or reduce such increases are:
   Does not apply to this Sewer System Plan update.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?
   Updates to the Sewer System Plan would not affect plants, animals, fish, or marine life.

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:
   Does not apply to this Sewer System Plan update.

3. How would the proposal be likely to deplete energy or natural resources?
   Updates to the Sewer System Plan would not deplete energy or natural resources. Sewer system improvements could require the use of construction materials and could require electricity for operation and would be assessed on a project basis.

   Proposed measures to protect or conserve energy and natural resources are:
   Efficient planning, design, equipment, and operation of the Sewer system would be accomplished in a manner that protects and conserves energy and natural resources.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?
   Updates to the Sewer System Plan would not affect environmentally sensitive areas and would provide greater protection of these areas through planning within the City's service area.

   Proposed measures to protect such resources or to avoid or reduce impacts are:
   Any proposed improvements or expansions to the City's sewer system would be consistent with the regulations and policies governing the protection of environmentally sensitive areas.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?
   Updates to the Sewer System Plan would not affect, allow, or encourage land and shoreline uses. Future system improvements and expansions will be compatible with the goals and policies of City's Comprehensive Plan (2013).

   Proposed measures to avoid or reduce shoreline and land use impacts are:

Does not apply to this Sewer System Plan update.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?
   The Sewer System Plan itself is not likely to use increase demands on transportation or public services and utilities. The Plan addresses future needs for the sewer system as demand grows in the future.

   Proposed measures to reduce or respond to such demand(s) are:
   Proposed sewer system improvement projects are outlined in the Sewer System Plan and will be evaluated for effects on a case-by-case basis.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.
   Updates to the Sewer System Plan, and this SEPA document, are being prepared to ensure compliance with State Department of Ecology and State Department of Health requirements. Individual projects will be evaluated for effects on the environment and the need for SEPA compliance.

Appendix B

City Codes

Chapter 13.50
SEWER SYSTEM

Sections:

13.50.010 Definitions.

Unless the context specifically indicates otherwise, the meaning of terms used in this chapter shall be as follows:

“Abut or abutting” means a parcel where the entire length of any one property line or parcel boundary line is adjacent to an easement and/or public right-of-way in which a sanitary sewer is located.

“Biosolids” means a microbial mass, produced by the reproduction of individual wastewater microorganisms under favorable homeostatic conditions, resulting in a solid or semisolid by-product of a wastewater treatment facility.

“BOD” (biochemical oxygen demand) means the quantity of oxygen utilized in the biochemical oxidation of organic matter in five days at 20 degrees Celsius, expressed in milligrams per liter. Quantitative analysis shall be made in accordance with procedures set forth in “Standard Methods.”

“Brush/brown yard waste” means brush, limbs and woody material obtained from pruning of residential properties, which must be chipped prior to composting and is transported in trash containers.

“Building drain” means that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste and other drainage pipes inside the walls of the building and conveys it to the building sewer.

“Bulk brush/brown waste” means brush, limbs and woody material obtained from pruning, which must be chipped prior to composting in quantities normally greater than two cubic yards.

“Bulk green waste” means grass, leaves, vegetable matter, and other soft green waste in quantities normally greater than 10 cubic yards.

“City” or “City of Langley” means the city of Langley.

“City engineer” means the city engineer of the city or a duly authorized representative.

“Clean Water Act” or “Act” means the federal Water Pollution Control Act, PL 92-500, and any amendments thereto; as well as any guidelines, limitations, and standards promulgated by the Environmental Protection Agency pursuant to the Act.

“COD” (chemical oxygen demand) means the measure of the oxygen equivalent of the organic matter content of a sample that is susceptible to oxidation by a strong chemical oxidant. Quantitative analysis shall be made in accordance with procedures set forth in “Standard Methods.”

“Composite sample, 24-hour, flow proportional” means a mixture of discrete samples, collected either manually or by automatic sampler, taken at the same sampling point with the sample volume being proportional to flow as measured over a 24-hour period.

“Compost facility” means the biosolid composting operation of the city of Langley located at the city’s wastewater treatment facility.

“Compostable material” means any suitable green waste (yard or bulk), brush/brown waste (yard or bulk), biosolids, dewatered cake material, or general organic material.

“Connecting sewers” means all of the items required to connect the building sewer to the existing municipal wastewater collection system.

“Contract cooling” means any cooling process whereby unpolluted water is brought into intimate or direct contact with any industrial, manufacturing trade, or business product for the purpose of heat dissipation or removal.

“Customer” means the property owner and/or occupant at the location where services are delivered.

“Director” means the public works director or his designee.

“Discharge rate, average daily” means the total volume of discharge, in gallons, occurring within a 24-hour period, which is representative of the majority of days in which a waste is discharged.

“Discharge rate, maximum daily” means the total volume of discharge, in gallons, occurring within a 24-hour period, which is representative of the maximum volume of waste which is, or potentially could be, discharged under other than average circumstances.

“Domestic wastewater” means untreated sanitary wastes from residential sources that pass through a sewer system to a publicly owned treatment works (POTW) for treatment.

“Dwelling unit” means a residential establishment consisting of a detached building.

“Effluent” means the water, together with any waste that may be present, flowing out of a building, process or treatment facility.

“Engineering department” means the city of Langley engineering office located at 112 Second Street, City Hall, Langley, Washington.

“EPA” means the federal Environmental Protection Agency.

“Explosionmeter” means a monitoring device used for the detection of combustible and/or toxic gases.

“Fat, oil and grease” means any substance or material with similar physical characteristics, such as biological lipids and mineral hydrocarbons, which can be determined quantitatively on the basis of

their common solubility in trichlorotrifluoroethane. Quantitative analysis shall be made in accordance with procedures set forth in “Standard Methods.”

“Garbage” means the residue from the preparation, cooking and dispensing of food, and from the handling, storage and sale of food products and produce.

“Grab sample” means a sample collected at a particular time and place and representative of the composition of the source at that time and place only.

“Grade” means the slope or fall of a line of pipe in reference to a horizontal plane, expressed as a ratio of horizontal distance to vertical distance.

“Grease, oil, sand interceptor” means a basin, sump or other device so designated to intercept and collect either grease, sand or oil thus preventing their entry into the wastewater treatment system.

“House connection” means the point of connection of the connecting sewers to the building sewer at the building.

“House lateral” means side sewer.

“Hydraulic load” means loadings imposed on the wastewater treatment system of or relating to a volume of water.

“Inert solids” means solids of a primarily nonbiological nature including materials such as sand, gravel, grit, grains, garbage or other similar materials.

“Interference” means the inhibition or disruption of the wastewater treatment processes or operations, which shall cause or tend to cause a violation of any requirement of the city’s NPDES permit. The term includes prevention of biosolids use or disposal in accordance with Section 405 of the Act (33 U.S.C. 1345), or any criteria, guidelines, or regulations developed pursuant to the Solid Waste Disposal Act (SWDA), the Clean Air Act, the Toxic Substances Control Act, or more stringent state criteria (including those contained in any state biosolids management plan prepared pursuant to the Title IV of SWDA) applicable to the method of disposal or use employed by the wastewater treatment facility.

“LEL” (lower explosive limit) means the lowest percentage at which a flash will occur or a flame will travel when methane vapor is mixed with air and a source of ignition is present. The LEL of methane in air is 5.3 percent.

“LMC” means Langley Municipal Code.

“Mass discharge quantity” means the weight of material discharged to the wastewater treatment system during a given time interval. Unless otherwise specified, the mass discharge quantity means pounds per day of a particular constituent or combination of constituents as calculated on a dry weight basis.

“May” shall indicate a discretionary condition.

“Mg/l” (milligrams per liter) shall be a mass-to-volume ratio; the milligrams per liter value multiplied by the conversion factor 8.34 shall be equivalent to pounds per million gallons of water.

“Nondomestic wastewater” means any type of wastewater which has a greater concentration of pollutants or a greater number of pollutants than would be found in wastewater from a typical residence.

“Normal operating removal capability” means the average amount of solids removed per day, both inert and biological, during a period of 60 days prior to any infraction or alleged infraction of this chapter.

“NPDES permit” (National Pollutant Discharge Elimination System permit) means the permit setting forth conditions for the discharge of any pollutant or combination of pollutants to the navigable waters of the United States pursuant to Section 402 of PL 92-500.

“Person” means any individual, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity or any other legal entity, or their legal representatives, agents or assigns.

“pH” means the logarithm of the reciprocal of the hydrogen-ion concentration. The concentration is the weight of hydrogen ions, in grams per liter of solution. Neutral water, for example, has a pH value of seven and a hydrogen-ion concentration of 10-7.

“POTW” means a publicly owned treatment works. An arrangement of equipment, structures and appurtenances such as, but not limited to, comminutors, basins, drives, blowers, digesters and any other systems required to treat wastewater, industrial waste and biosolids.

“Premises” means a parcel of real estate including any improvements thereon, which is determined by the director to be a user.

“Pretreatment” means the process of neutralizing or reducing the amount of pollutants, eliminating pollutants or altering the nature of pollutant properties to a less harmful state by physical, chemical or biological processes prior to or in lieu of discharging or otherwise introducing such pollutants into the wastewater treatment system.

“Pretreatment standards or categorical standards” means regulations applicable to specific categories of industrial users, containing pollutant discharge limits promulgated by EPA in accordance with Section 3.07(b) and (c) of the Act as established under 40 CFR Chapter 1, Subchapter N.

“Process wastewater” means any liquid waste discharge resulting from industrial, trade, manufacturing, business, commercial or contact cooling process or from the development, recovery or processing of natural resources.

“Public sewer” means a sewer in which all owners of abutting properties have equal rights, and which is controlled by public authority.

“Public works department” means the city of Langley public works office located at 112 Second Street, City Hall, Langley, Washington.

“Qualified professional” means a person, in the employ of the city with sufficient knowledge of permit requirements, facilities, and discharge characteristics, so as to be capable of determining and confirming whether or not a user is in compliance and if not, what measures must be taken to achieve compliance.

“Radioactive waste or isotope” means elements or isotopes, whether free or combined, which are a source of particles and/or rays resulting from the disintegration of the atomic nuclei caused by fission, fusion, particle acceleration, or other related artificial sources or processes.

“Sanitary sewer” means a sewer, which carries wastewater, and to which storm, surface, ground and other unpolluted water are not intentionally admitted.

“Service connection” means the connecting sewer.

“Sewer” means a pipe or conduit for carrying sewage.

“Shall” is mandatory.

“SIC” (Standard Industrial Classification) means a classification code (1972) issued by the Executive Office of the President, Office of Management and Budget, for use in the classification of establishments by types of business and the primary economic activity engaged in.

“Side sewer” means service connection from the public main to the premises served.

“Standard methods” means the examination and analytical procedures set forth in the most recent edition of “Standard Methods for the Examination of Water and Wastewater” published jointly by the American Public Health Association, the American Water Works Association and the Water Environment Federation.

“Suspended solids” means solids that either float on the surface of, or are in suspension in, water, wastewater or other liquids, and which are removable by laboratory filtering. Quantitative analysis shall be made in accordance with procedures set forth in “Standard Methods.”

“Temporary lift station” means any lift station that is installed in conjunction with a nonstandard sewer main extension.

“Toxic” means those substances or combinations of substances, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through the food chains, have the potential to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions, including malfunctions in reproduction or physical deformations, in such organisms or their offspring.

“Upset” means an exceptional incident in which a discharger unintentionally is in a state of noncompliance with discharge limitations set forth and excludes inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation thereof.

“Waste” means wastewater and any and all other waste substances, liquid, solid, gaseous or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing or processing operation of whatever nature.

“Waste discharge permit” means a permit authorized by the Washington State Department of Ecology (pursuant to Chapter 173-216 WAC) regulating commercial and industrial discharges to a publicly owned treatment works.

“Wastewater collection system” means any and all of the connecting, lateral, main, trunk sewers, interceptors, and lift stations.

“Wastewater constituents and/or characteristics” means the individual chemical, physical, bacteriological and radiological parameters, including volume and flow rate and such other parameters that serve to define, classify or measure the contents, quantity, and strength of wastewater.

“Wastewater treatment plant” means an arrangement of equipment, structures and appurtenances such as, but not limited to, comminutors, basins, drives, blowers, digesters and any other systems required to treat wastewater, industrial waste and biosolids.

“Wastewater treatment system” means any and all of the connecting, lateral, main, trunk sewers, interceptors, lift stations including wastewater treatment plant and facilities. (Ord. 786, 2000)

13.50.020 Purpose and policy.

A. This chapter establishes requirements for wastewater discharge into the city of Langley wastewater treatment system. It enables the public works department to protect the public health consistent with applicable local, state and federal laws. The objectives of this chapter are:

1. To prevent the discharge of untreated pollutants into the wastewater treatment system, that will pass into Saratoga Passage or the atmosphere or otherwise be incompatible with the system;

2. To prevent the discharge of untreated pollutants into the wastewater treatment system that will interfere with the normal operation of the system or contaminate the system-generated biosolids; and

3. To improve the opportunity to recycle and reclaim biosolids from the system.

B. This chapter regulates wastewater discharge into the city’s treatment system through enforcement of federal discharge standards, set forth in 40 CFR Part 403. Further, it provides for the application of RCW 90.48.160 relating to industrial and commercial discharges to the POTW. It also authorizes monitoring, inspection, user reporting and other enforcement activities as required. Finally, it provides for the setting of fees for the equitable distribution of costs resulting from the program.

C. This chapter shall apply to the users of the city wastewater treatment system. Except as otherwise provided herein, the city of Langley director of public works shall administer, implement and enforce the provisions of this chapter. (Ord. 786, 2000)

13.50.030 Standards.

A. Prohibited Discharge Standards. Any waters or wastes that the public works department determines are harmful to the wastewater treatment system, environment, public health and welfare or that interfere with the operation of the system are prohibited. No person shall discharge, deposit or cause to allow to be discharged or deposited into the wastewater treatment system any wastewater or substance that contain any of the following:

1. Liquids, solids or gases which by reason of their nature or quantity may be sufficient, either alone or by interaction with other substances, to cause or tend to cause fire or explosion or be injurious to the wastewater treatment system or personnel engaged in the operation, maintenance or repair, or monitoring of the same. At no time shall two successive readings on an explosionmeter, at an access in nearest proximity to the point of discharge into the wastewater treatment system, be more than five percent of the lower explosive limit (LEL) of the meter nor shall any single reading exceed 10 percent of the LEL.

2. Solid or viscous wastes which will or may cause obstruction to the flow in a sewer, require excessive cleaning or maintenance of the sewer or otherwise interfere with the proper operation of the wastewater treatment system.

3. Garbage that has not been ground or comminuted to such a degree that all particles will be carried freely in suspension under flow conditions normally prevailing in the public sewers, with no particles greater than one-half inch in any dimension.

4. Noxious or malodorous solids, liquids or gases which either singly, or by interaction with other wastes, are capable of creating a public nuisance or hazard to life, or are or may be sufficient to prevent entry into the wastewater treatment system for the purpose of monitoring, maintenance or repair.

5. Wastes discharged into the wastewater treatment system that do not have a pH value in the range of six to nine standard units at an access in nearest proximity to the point of discharge into the wastewater treatment system. Prohibited materials include, but are not limited to, compounds and substances, which will react with water to form acidic or alkaline products.

6. Wastewater or materials containing fat, oil or grease of a concentration exceeding 100 mg/l, or as may be established by the department whether emulsified or not, or containing substances which may solidify or become viscous at temperatures between zero and 65 degrees Celsius (32 degrees F and 150 degrees F) at an access in nearest proximity to the point of discharge into the wastewater treatment system.

7. Radioactive wastes or isotopes of such half-life or concentration that they do not comply with regulations or orders issued by the appropriate authority having control over their use and which will or may cause damage or hazards to the wastewater treatment system or personnel engaged in the operation, maintenance or treatment of the same.

8. Any wastewater or materials not removable by the wastewater treatment process, which will cause discoloration of the wastewater treatment plant effluent or treatment residue.

9. Heated wastewater in amounts which will cause or are likely to cause deterioration or hazard to the wastewater treatment system, or personnel engaged in monitoring, maintenance or repair of the treatment system. In no case shall wastewater with a temperature exceeding 40 degrees Celsius (104 degrees F) be introduced into the wastewater treatment collection system.

10. Any unpolluted water including, but not limited to, cooling water, rainwater, stormwater, creek water or ground water which will increase the hydraulic load on the wastewater treatment system, except in cases where no prudent and reasonable alternative exists as determined by the director.

11. Wastewater at a flow rate or containing such concentrations of pollutants released in a single extraordinary discharge episode such that would cause interference with the wastewater treatment system or result in the accumulation or production of inert or biological sludges in excess of normal operating removal capability, or adversely affects the treatment residues, biosolids or scums.

12. Wastewater discharges, except as authorized by the director, shall not contain in excess of the following:

Parameter	Limitation
Biochemical Oxygen Demand	300 mg/l or 25 lbs./day
Suspended Solids	300 mg/l or 25 lbs./day

The director may allow discharges in excess of the limits set forth providing that such discharge has little or no adverse impact on the wastewater treatment operations and the discharge complies with any relevant categorical standards.

13. Any wastewater containing toxic pollutants in sufficient quantity, either singly or by interaction with other substances, to injure or interfere with any wastewater treatment process, constitutes a hazard to humans or animals or to exceed the limitations set forth in this chapter.

14. Any substance which may cause the wastewater treatment plant effluent or treatment residues, biosolids or scums to be unsuitable for reclamation and reuse or to interfere with the reclamation process.

15. Any substances which may cause or may tend to cause the POTW to violate its NPDES and/or other disposal system permits.

16. Process wastewater metal concentrations exceeding such local limits as may be determined by the director except where allowed by permit.

B. Categorical Standards. No person shall discharge or cause to allow to be discharged or deposited any waters or wastes that do not conform to the federal categorical pretreatment standards set forth in 40 CFR Part 403 and any amendments thereof or those limits established through the State Waste Discharge Permit Program, Chapter 173-216 WAC. No wastewater, water or waste, including commercial and industrial waste, shall contain any substance which may cause or tend to cause a

violation of any state or federal pretreatment standards, discharge permit requirement or which may be determined by the director to be unduly harmful or deleterious to the wastewater treatment system, environment, public health and welfare or interfere with the operation of the POTW. (Ord. 786, 2000)

13.50.040 Connection and permit issuance.

A. A person may connect and discharge waste into the city wastewater system when: (1) they own property within the city limits, (2) said property is adjacent to and abutting the city's wastewater collection system, (3) when said property has not been assessed for any prior sanitary sewer improvement, and (4) after the public works department issues a valid permit.

B. A permit shall issue for the service property upon the owner's written application but subject to the following terms and conditions:

1. The applicant shall: (a) obtain all other related permits, (b) pay all city required fees, and (c) construct the connecting sewers in compliance with city requirements and specifications governing the same.

2. The applicant shall pay the city in cash any other code-required sewer connection charges, prior to the issuance of any permit authorized in this section.

3. All connection charges so received shall be considered wastewater system revenue.

4. All city ordinances, rules, regulations and procedures, or any amendments thereof, relating to the use, maintenance and connection to the wastewater treatment system shall apply with equal force to such sewer connection. (Ord. 786, 2000)

13.50.045 Service to urban growth area – (New).

Development proposed in the Langley UGA that is on property contiguous to the city shall be annexed to and be served by sewer service from the city as per the provisions set forth in the June 28, 1999, interlocal agreement between Island County and the city of Langley. If development is proposed in the UGA but not on property contiguous to the city limits and, therefore, not eligible for annexation, the owner/applicant shall execute an annexation/development agreement, prepare a development plan, and comply with all provisions of the UGA-Langley zone, all as set forth in the interlocal agreement referenced above, as a condition of sewer service being extended to serve the property. (Ord. 798, 2001)

Nonstandard Sewer Connection

13.50.050 General.

A. In order to qualify for a nonstandard sewer system connection the property owner shall be on public record agreeing to participate in a sanitary sewer ULID extension. If the property owner is on public record opposing a proposed ULID extension, then connection to the sewer system shall only occur through a standard connection to a sewer main.

B. All nonstandard sewer connections shall receive city council approval on a case-by-case basis. Upon council approval of a nonstandard sewer connection, the property owner shall deposit with the city a surety in the amount of a reasonable frontage charge of a sewer main. This charge shall be set by council resolution.

C. All nonstandard sewer connections shall be designed by a professional engineer registered in the state of Washington. All plans submitted shall be subject to the rules and regulations adopted by the city of Langley and shall require approval by the city's engineering department.

D. The owner shall bear all costs associated with the nonstandard sewer connection application, installation and maintenance of the sewer line, to and including the connection at the city owned gravity sewer main.

E. 1. When property is being served by a nonstandard sewer connection and the city accepts a new sewer main abutting the customer's property, then the customer shall connect to the new main. The city shall provide the customer written notice of the requirement to connect. The customer shall connect within 90 days of city notification. The customer shall further be responsible for all costs associated with the connection to the new main. The customer shall also pay all latecomer fees and all other applicable fees due for the proportionate share of the cost of installing any sewer main installed adjacent to the service property. The surety outlined in subsection (B) of this section shall be applied to the property owner's share of sewer main installation. If the surety is in excess of the actual charges, the property owner shall be refunded the balance. If the surety does not cover the actual costs, the property owner shall be responsible to pay the difference between the surety and the actual cost.

2. When property is being served by a nonstandard sewer connection and the city accepts a new sewer main within 200 feet of the customer's property, the customer shall connect to the new main. The city shall provide the customer written notice of the requirement to connect. The customer shall connect within 90 days of city notification. The customer shall bear all costs associated with extending the sewer main across the customer's property if required. The extension shall meet all requirements outlined in Title 15. The customer may file a latecomer agreement with the city if applicable.

F. Upon connection to a standard sewer main, all nonstandard sewer appurtenances shall be properly disconnected and abandoned, at the customer's expense, as ordered by the city engineering department.

G. The connection fee for a nonstandard sewer installation shall be the same as a standard sewer installation as adopted by council resolution. The fee shall be paid at the time of connection and shall be credited toward connection fees due upon subsequent installation of a standard connection.

H. Installation of tanks, pumps and switches shall be inspected and certified by the design engineer and an inspection report filed with the public works department. The design engineer shall provide as-built drawings of the entire installation, including piping, to the city prior to final city acceptance of the improvements.

I. The applicant shall be responsible for obtaining a right-of-way permit and all other applicable permits that may be required. (Ord. 786, 2000)

13.50.060 STEP system.

A. In cases where an existing single-family residence experiences drainfield failure, a septic tank effluent pump (STEP) system may be allowed if the following conditions are met:

1. The property owner has attempted to form a sanitary sewer ULID and cannot obtain the required support;

2. The property owner provides written verification from Island County health department that the failed drainfield cannot be repaired and construction of a new drainfield is not possible/feasible;

3. The property is more than 200 feet from an existing sewer main but no more than 1,500 feet from an existing sewer main; and

4. The property is located within the corporate city limits of the city of Langley.

B. A STEP system may be allowed in undeveloped RS-5000 and RS-7200 zoned property under the following conditions:

1. The property owner has attempted to form a sanitary sewer ULID and cannot obtain the required support;

2. The undeveloped property is more than 200 feet from an existing sewer main but no more than 1,500 feet from an existing sewer main; and

3. The undeveloped property is located within the corporate city limits of the city of Langley.

C. Where additional STEP system connection(s) is/are proposed in areas where STEP system connections exist or are proposed, the city engineer may require that the STEP system connections be consolidated to preserve the existing right-of-way for public uses. Such installations shall be made only at the expense of the customer connecting to the existing system.

D. Any STEP system line located in the city right-of-way or on private property shall require a recorded easement prior to installation. The benefiting property owner shall be responsible for providing a draft of the easement(s) to the city for approval prior to recording of the easement(s) and the owner shall be responsible for all costs associated with recording the easement. (Ord. 786, 2000)

13.50.070 Alternative holding tank.

A. In cases where property zoned NB is undeveloped and sewer service is not available, an alternative method of sewage disposal, such as use of a holding tank sewage system, may be allowed; provided, that the following conditions are met:

1. The property owner has attempted to form a sanitary sewer ULID and cannot obtain the required support.

2. The property is more than 200 feet from an existing sewer main.

3. Property uses are limited to those identified as principal or conditional uses in Title 18 and generate low indoor water and sewage flow, such as offices and plant nurseries. No residential uses shall be allowed.

4. Agreement that property shall be connected to the city sewer system within 90 days of city notification of the requirement to connect after installation of a new sewer main within 200 feet of the property.

5. Rates shall be the same as those assessed commercial businesses plus a surcharge to the base rate as set by council resolution. Connection fees, as set by council resolution, shall be paid upon approval of the application for an alternative holding tank system.

6. Provide a copy of a contract for services between the property owner(s) and a licensed septic pumping company to the city upon request. The applicant shall provide the city with pumping records bi-monthly. Records shall be submitted to the director of public works by the tenth of the month following the two-month reporting period.

7. The property owner shall bear all costs associated with the approved system, including construction and maintenance.

B. If approved, applicant acknowledges that approval is granted for the current applicant only, that said approval does not run with the land or the building, and that said approval is in no other aspect transferable. The city reserves the right to review and approve any change in use of the premises. A use which is not approved by the city will result in cancellation of approval. (Ord. 786, 2000)

13.50.075 Nonstandard sewer connection, long plats – General provisions.

A. In cases where a plat of five or more lots is proposed a nonstandard sewer extension may be allowed under the following conditions:

1. The property must be zoned residential; and

2. The property must be vacant; and

3. The installation shall extend from the boundary of the property to an existing sewer main; and

4. The parcel is a minimum of 500 feet from an existing sewer main but no more than 1,500 feet from an existing sewer main; and

5. The property is located within the corporate limits of the city of Langley; and

6. The proposed nonstandard sewer extension shall be subject to city council approval, based on a recommendation from the city planning and public works departments; and

7. Upon city council approval, the proponent shall deposit with the city a surety in an amount equal to the estimated cost, as determined by the city engineer, to connect to a standard sewer main when it becomes available within 200 feet of a boundary of the plat.

B. In addition to the above provisions, the following standards shall be met:

1. All lots within the proposed plat must be served by a standard sewer main system. Individual lots shall connect to the standard sewer main as allowed in either Section 13.50.060 or Sections 15.01.255 through 15.01.284.

2. The owner of the proposed plat may be required to install and maintain a temporary lift station to serve the proposed plat. Temporary lift station parts and controls shall be compatible with lift stations currently in use in the city of Langley sewer system. The city may, at its discretion, enter into an agreement with the property developer to purchase the surplus lift station parts according to a predetermined depreciation schedule. Said depreciation schedule shall not exceed five years in length.

3. In the event a standard sewer main plan design is shown in the city comprehensive sewer plan along the route of a proposed nonstandard sewer extension, the developer shall be required to install the planned standard sewer main as shown in the comprehensive sewer plan as part of the nonstandard sewer extension. The developer may enter into a contract with the city providing for a latecomer agreement as outlined in Section 15.01.090 where applicable.

4. All nonstandard sewer extensions shall conform to Section 15.01.040, Design standards.

5. The developer shall maintain ownership of all nonstandard sewer main extensions and the standard sewer main system within the long plat. When the nonstandard sewer extension is abandoned in lieu of a standard extension and the standard sewer main system within the plat is properly connected to the city sewer system the developer shall transfer title by deed to the city. Ownership of the nonstandard sewer extension and the standard sewer main system within the plat may be transferred to the homeowners association of the plat.

6. Upon abandonment of the nonstandard sewer main, connection to a standard sewer main and city acceptance of the existing sewer main within the plat, the developer and/or the homeowners association shall deed the sewer main located within the plat to the city of Langley. Until such time that the standard sewer main is accepted by and deeded to the city of Langley, maintenance responsibilities shall remain with the developer and/or the homeowners association.

7. The design engineer shall incorporate into the design of the improvements provision for connecting to a standard sewer main extension as outlined in the general sewer plan of the city of Langley. (Ord. 785, 2000)

13.50.080 Violation.

Violation of any of the provisions of this chapter may result in termination of the water service to the premises served. The owner shall be responsible for all costs associated with termination. Water service shall not be restored until all costs and fees due are paid in full. The customer shall also be responsible for payment of all costs associated with restoring service. (Ord. 820, 2002; Ord. 786, 2000)

13.50.090 Delinquent charges.

All delinquent charges shall be a lien against the property served and shall be perfected and enforced as provided by the laws of the state governing municipal utility liens. (Ord. 786, 2000)

13.50.100 Discontinuance of water service on delinquent accounts.

In addition to the lien provided for in Section 13.50.090, the city has the right to discontinue water service to the premises where payment of any charges are delinquent. The city may discontinue said water service at the discretion of the public works department until delinquent rates, charges and penalties have been paid in full. (Ord. 786, 2000)

13.50.110 Connection required, exemptions and enforcement.

A. All development in mixed residential and commercial zones is required to be served by the city's public sewage system.

B. All development in a neighborhood business zone is required to be served by the city's public sewage system, except as otherwise addressed in the city code. (Reference: Nonstandard Sewer Connection.)

C. In a residential zone all new development and expansions/remodels of existing principal buildings that constitute 50 percent or more of the appraised value of the building(s) is/are required to be served by the city's public sewer system, if the development is within 200 feet of a city sewer main measured from the property line nearest to the sewer, except as otherwise addressed in the city code (reference: Nonstandard Sewer Connection). All proposed subdivision (short and long) and related multiple lot developments are required to be served by the city's sewer system. Developments/redevelopments of a single-family residence on a lot that is not within 200 feet of a sewer main may be served by an onsite septic system.

D. An accessory dwelling unit or guest house may be served by an onsite septic system if it can be shown to the satisfaction of the Island County health department that the existing septic system is functioning properly; has the design capacity to accept the flow from the accessory dwelling unit or guest house; and complies with all applicable Island County health department regulations.

E. All existing developments in a residential zone served by an onsite sewage disposal system and located within 200 feet of an existing city sewer main, measured from the property line nearest to the sewer, and otherwise not required to connect by the provisions in this chapter, shall connect to the city sewer system (1) when there is a change of property ownership or (2) when the onsite system fails and the Island County health department verifies that the failed system cannot be repaired and construction of a new system is not possible/feasible. Use of the onsite system shall be discontinued upon connection to the city sewer system.

F. Except in residential zones, all property owners shall connect existing development to the sewer within two years of being notified by the city of their requirement to connect. Any property owner who chooses not to connect within 90 days of receiving notice from the city shall be subject to a monthly sewer service fee. Such imposition shall be the same as if such dwelling or other facility were in fact connected to the sewer system. In addition, if such connection is not made within two years after

notice is provided by the city of the requirement to connect, a lien shall be recorded upon the subject property for fees due in relation to the required connection.

G. All costs and expenses incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the city from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer. (Ord. 860, 2005; Ord. 820, 2002; Ord. 786, 2000)

13.50.120 Availability charge.

There is imposed upon each customer who has sewer available but who is not yet connected to the sewer, and such customer shall pay, a monthly charge equal to the monthly user charge or minimum user charge that would be collected if that customer were connected to the sewer system. The availability charge shall be considered as ordinary rate revenue. (Ord. 786, 2000)

13.50.125 Procedure after failure to connect.

If the owner of any dwelling or other facility subject to be connected to the wastewater collection system fails to make the necessary connection within 90 days after receiving written notification to make such connection, the monthly availability charge for sewer service shall be imposed. In addition, if such connection is not made within one year after notice to connect is given, the city attorney shall begin a lawsuit in Island County superior court. Said legal action shall be against the owner or owners of the property. Said legal action shall request that the court order the owner to make the required connection. If the city prevails, then the owner shall be liable for all costs of said suit, including a reasonable attorney's fee. (Ord. 786, 2000)

13.50.130 Permit required.

It is unlawful for any person to make any connection, or in any way alter either an existing connection to the sanitary sewer or the wastewater treatment system, without authorization by the public works department. It is unlawful for any person to connect any private sewer line to a sewer in any street or alley without the necessary permit from the public works department.

Except as provided in this chapter, it is unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage. (Ord. 786, 2000)

13.50.140 Permit issuance.

A. Side Sewer. In order to connect to the wastewater treatment system, the property owner shall file an application with the public works department stating the following: (1) name of the owner and occupant of the premises to be connected, (2) location of the building where the lateral is proposed, (3) the type of material to be used, and (4) the grade upon which it will be laid. If application is satisfactory, the engineering department will authorize the required permit. Thereafter, the owner may construct the necessary line on their own property. The public works department shall prepare and keep on file at City Hall accurate records of all buildings connected to the wastewater collection system. Said records shall include a small plan showing the buildings involved, the adjacent streets, the main sewer and the house connection.

B. Pretreatment. Industrial, commercial and business establishments may be required to install such pretreatment facilities, devices, or other related appurtenances such as, but not limited to: grease, oil or sand interceptors, comminutors, screens and pH control, as determined by the director, to be necessary to comply with Section 13.50.030 (Standards). An application shall be filed with the public works department stating: (1) the name of the property owner and occupant of the premises to be connected through pretreatment devices, (2) where the device is to be located and maintained, (3) pertinent technical information and construction details, and (4) a plan showing process waste streams through the facility waste characterization and flows. If review by the engineering department finds that the application satisfies the rules, regulations, limitations and requirements established by this chapter, the required permit shall be issued to the owner. Further, it shall be the responsibility of the property owner to provide for the operation and maintenance of such facilities, devices or other related appurtenances, as required by the city engineer. The city shall require prior notification of any proposed changes, additions, modifications and/or alterations to pretreatment devices approved and permitted by the public works department. (Ord. 786, 2000)

13.50.150 Minimum and maximum grades.

A. In all cases where it is possible, the minimum grade on all lateral sanitary sewers shall be two percent. No exception to this rule will be allowed where new homes, built after the sewer to be used has been constructed, apply for a permit. And if there is any waste matter to be disposed of from basements or any other portions of the house be constructed at such an elevation that a two percent grade cannot be used, the property owners will be required to install a suitable pump.

B. Where homes older than the sewer are involved, and a two percent grade is impossible to achieve, the grade may be lowered to one percent if, after review by the engineering department, there is a written finding that such a grade will function properly. If the house, for any reason, is so low that even a one percent grade cannot be obtained, the property owner will be required to install a suitable pump for discharging their waste into the wastewater treatment system. No septic tanks will be permitted if the house is within 200 feet of a sewer.

C. In those cases where a sewer is abnormally deep, the house lateral shall have a maximum grade of five percent, discharging into a vertical riser from the main sewer.

D. Each building must be connected to the wastewater collection system through its own individual side sewer. No exceptions will be permitted without written permission of the engineering department.

E. Any and all pumps required to be installed under the terms of this section shall have the written approval of the engineering department before their installation. In addition, all grades less than two percent or greater than five percent shall have written approval of the engineering department. (Ord. 786, 2000)

13.50.160 House connections.

All sewer house connections shall be constructed as specified in the city of Langley development construction standards, Chapter 15.01. (Ord. 786, 2000)

13.50.170 Inspection.

A. House Connections. The public works department shall inspect all work on house connections before any backfilling is done. When such work is ready for inspection, the public works department shall be notified. If the work is found to be satisfactory, backfilling may proceed and the job brought to completion. Should the work not be acceptable, all errors noted by the inspector must be rectified and a second inspection made at the owner's expense. The public works department shall have right of entry on any premises at any reasonable time for purposes of inspection.

B. Compliance. The public works department shall inspect the facilities of any user to ascertain whether the purposes of this title are being met and whether all requirements are being complied with. Persons or occupants of premises where wastewater is created or discharged shall allow representatives of the public works and/or engineering department ready access at all reasonable times. Said access shall be allowed to all parts of the premises for the purposes of inspection, sampling, records examination or otherwise in the performance of their duties. Access shall include setting up such devices on the user's property, as are necessary to conduct sampling, inspection, compliance monitoring and/or metering operations.

C. Monitoring. The city may require that monitoring facilities be provided, operated and maintained at the owner's expense. If required, said facilities will enable monitoring, inspection, sampling and flow measurement of the building sewer and/or internal drainage systems. Ample room shall be provided in or near such sampling manhole or facility to enable accurate sampling and preparation of samples for analysis. The facility, sampling and measuring equipment shall be maintained at all times, at the expense of the user, in a safe and proper operating condition. Whether constructed on public or private property, the sampling and monitoring facilities shall be provided in accordance with the city's requirements and all applicable local construction standards and specifications. Construction shall be completed within 90 days following written notification by the city. (Ord. 786, 2000)

13.50.180 Roots obstructing collection system.

Within 30 feet of any public or private sewer or drain pipe it shall be unlawful to plant any of the following forms of vegetation: poplar, cottonwood, soft maple, gum, or any other tree or shrub whose roots are likely to obstruct public or private sanitary sewers. When the trees or roots of any trees or plants are obstructing or likely to obstruct a public street or right-of-way the city engineering department is authorized to order their removal. Ten days' written notice shall be given to the owner or occupant of the abutting property to remove the same. If such owner or occupant fails or refuses to do so when ordered, the reasonable cost of such removal shall be charged against and become a lien upon the abutting property. The office of the city attorney is authorized and directed to collect such charge by suit maintained in the name of the city as plaintiff, against the owner, in any court of competent jurisdiction. The costs of said suit shall be taxed against the owner, together with a reasonable attorney's fee according to law. (Ord. 786, 2000)

13.50.190 Prohibited use of sanitary sewer.

No person shall discharge or cause to be discharged any stormwater, surface water, ground water, roof runoff, drains, catch basins, area drainage, subsurface drainage, cooling or untreated industrial process waters into any wastewater treatment system. (Ord. 786, 2000)

13.50.200 Enforcement.

A. Harmful Contributions. When an actual or potential discharge presents an imminent or substantial endangerment to the public health and welfare, the environment, the waste water collection system, the POTW or constitutes a violation of the city's NPDES permit, the city may immediately suspend wastewater treatment service. Any person receiving notice of a suspension of wastewater treatment service shall immediately stop or eliminate the contributing discharge. In the event of a failure of the person to comply voluntarily with the suspension order, the city may take such steps as are considered necessary to abate the problem. These steps may include but are not limited to severance of the sewer connection. The city shall reinstate wastewater treatment service upon proof of the elimination of the discharge violation. Within 15 days of the occurrence, the violating party must submit a detailed written statement describing the causes of the harmful contribution and measures taken to prevent future occurrence.

B. Violation. Whenever the city finds, after investigation performed either by qualified city staff or an affidavit of complaint verified by a qualified professional, that any user is not in compliance with all requirements, limitations and prohibitions of this chapter the city shall proceed to enforce compliance with the code as outlined in Chapter 1.14.

Any person who shall violate any provisions of this chapter shall be liable to the city for any expense, loss, damage, cost of inspection or cost of correction incurred by the city by reason of such violation, including any cost to the city incurred in collecting from such person the loss, damage, expense, cost of inspection or cost of correction. (Ord. 786, 2000)

13.50.210 Penalty – Cost.

A. Violation of or failure to comply with any of the provisions of this chapter shall be subject to a civil penalty as set forth in Chapter 1.14. When violations are of a continuing nature, the penalty shall increase each day of the violation as set forth in Section 1.14.050(E).

B. Any person who knowingly makes any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to this chapter or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this chapter is subject to the penalties as outlined in Chapter 1.14. (Ord. 832, 2003; Ord. 786, 2000)

Biosolids

13.50.220 General organic material – Acceptance and payment.

General organic material shall be accepted at the discretion of the compost facility operator and charged a fee for acceptance at the rate set by council resolution. The compost facility operator shall punch the card, purchased in advance at Langley City Hall, for the amount of material dumped. (Ord. 786, 2000)

13.50.230 Biosolids/septage – Acceptance and billing.

Biosolids and/or septage may be accepted at the discretion of the public works director or the director's designee. When the waste stream consists of slurry with less than three percent solids, it shall be accepted and charged a fee at the rate per gallon as set by council resolution. When the

waste stream consists of dewatered cake material, the fee for acceptance shall be per cubic yard as set by council resolution. The compost facility operator shall provide billing information to the public works director by the tenth day of the month following the month in which biosolids or septage was received. (Ord. 786, 2000)

13.50.240 Water treatment sludge – Acceptance.

The Langley wastewater treatment plant will not accept sludge material from other wastewater treatment facilities. (Ord. 786, 2000)

13.50.250 Compost material collection – Quality control.

The acceptance of any compostable material shall be at the discretion of the compost facility operator. The compost facility operator shall determine the suitability of the material, the quality of the material, and the need for composting material and the ability to refuse acceptance shall be within the authority of the operator. (Ord. 786, 2000)

13.50.260 Hours of operation – Timing of acceptance.

The city of Langley shall determine the hours that the composting facility will be open to accept compostable material. The city shall establish hours of operation and the operator shall not vary from the established hours without prior authorization from the city. (Ord. 786, 2000)

13.50.270 Sale and disposal of finished compost.

A. Finished compost shall be sold by the cubic yard. The fee for finished compost shall be set by resolution of the city council.

1. Small quantity and/or retail sales (10 cubic yards or less) shall prepay at Langley City Hall and the purchaser shall display his/her receipt to the compost facility operator at the time of loading.

2. Large quantity and/or wholesale sales (greater than 10 cubic yards) may be billed to the purchaser with prior approval from the city. A down payment may be required for large quantity and/or wholesale sales. It shall be the responsibility of the composting facilities operator to report quantities to City Hall who will then bill the customer for the sale of finished compost.

B. The city of Langley public works department may use finished compost for city purposes at no cost to the public works department.

C. The city of Langley may also, from time to time, declare a surplus of compost and set a special surplus sale price. Surplus sale prices may deviate significantly from the fee schedule. (Ord. 786, 2000)

13.50.280 Collection of funds – Punch cards and finished compost.

The collection of all funds associated with the composting operation, including but not limited to the sale of punch cards, acceptance of compostable material not associated with a punch card, and the sale of finished compost, shall be performed at City Hall. No funds related to the operation of the compost facility shall be collected, handled, transferred, or submitted by the compost facility operator.

Any billing statements generated by the compost facility operator shall be forwarded to City Hall for disposition. (Ord. 786, 2000)

13.50.290 Exemption for city sponsored events.

To the extent that the city of Langley sponsors spring cleanup events or other similar activities, the fees contained in the fee schedule, as set by council resolution, may be temporarily waived through the action of the city council. The event coordinator shall be required to follow the rules established by the city for disposal of event-generated material. (Ord. 786, 2000)

Rates and Accounts

13.50.295 Accounts.

All accounts for sewer service shall be kept in the name of the owner and all charges shall be made against the property, as well as the owner thereof, and no change of ownership shall affect the application of this chapter. (Ord. 786, 2000)

13.50.300 Bulk disposal – Rates and regulations.

A. The sewage treatment system may be used for the disposition of septic tank withdrawals, provided:

1. All septage must come from within the corporate limits of the city of Langley or from within the urban growth area adopted in the city of Langley comprehensive plan. Documentation showing the origin of the septage shall be provided to and remain on file with the plant operator prior to dumping.

2. Septic haulers must obtain a city of Langley contractor's license.

3. Only domestic septage will be accepted.

4. Septage will be accepted at the city of Langley wastewater treatment plant at times set by the city.

5. The city reserves the right to discontinue service.

B. The charge for the services shall be a base monthly fee (for the month in which dumping at the city's facility occurs), plus a per gallon fee as outlined in the city municipal code fee schedule. (Ord. 786, 2000)

13.50.310 Governmental agent sewer service charge.

Any nonprofit corporation, organized in the state of Washington, which contracts with the city or county to perform an intentionally delegated governmental function or which acts as an agent for the county under Chapter 36.37 RCW and Chapter 15.76 RCW shall be billed for all sewer services delivered by the city, at the base rate described under Section 13.50.320(A), Residential Sewer Service Charge, or its equivalent. There shall also be an additional ULID service charge as set by council resolution. (Ord. 786, 2000)

13.50.320 Sewer service charge.

A. Residential Sewer Service Charge.

1. All residential accounts shall be charged a base monthly rate, as set by council resolution, for sewer service. This charge shall cover only the first 3,750 gallons of water used over a two-month period. Accounts used in excess of 3,750 gallons will be billed according to subsections (A)(2) and (3) of this section.

2. Winter Usage. During the months of November through February, water usage over the base amount of 3,750 gallons for a two-month period will be billed a rate, as set by council resolution, for each additional gallon used over 3,750 gallons, per two-month period.

3. Summer Usage. During the months of March through October, water usage over the base amount of 3,750 gallons for a two-month period will be billed a rate as set by council resolution for the average gallonage used in excess of 3,750 gallons per two-month period over the prior period of November through February; unless the water use in the summer billing period is less than the average use during November through February, in which case the water usage over the base amount during the summer billing period will be billed a rate per gallon, as set by council resolution, for water used in excess of 3,750 gallons during the summer billing period.

B. Commercial Sewer Service Charge.

1. All commercial accounts shall be charged a base monthly rate, as set by council resolution, for sewer service, plus a rate per gallon, as set by council resolution, for water usage in excess of that described in subsections (B)(2) and (3) of this section.

2. Bed and breakfast accounts shall be charged a rate per gallon, as set by council resolution, for each additional gallon used over 3,750 gallons during each two-month billing period during the period of November through February, and a per gallon rate, as set by council resolution, for each additional gallon used over 6,000 gallons during each two-month billing period during the period of March through October.

3. All other commercial accounts shall be charged a rate per gallon for each additional gallon used over 3,750 gallons per two-month billing period. (Ord. 786, 2000)

13.50.330 Commercial sewer ULID no. 8 surcharge.

A. In addition to charges in Section 13.50.320, all commercial enterprises will be charged an additional fee, as set by council resolution, per month for the first 3,750 gallons used per two-month billing period. Amounts used in excess of 3,750 gallons will be billed a per gallon charge, as set by council resolution, for each additional gallon used over 3,750 gallons per two-month billing period.

B. All funds collected under this section shall be placed in a special city fund, which shall be designated to service the debt incurred by construction of the secondary sewer treatment plant. Such funds shall only be used to pay principal and interest on ULID no. 8 bond and grant anticipation notes, bonds, or any other such financing instrument as the city shall utilize to construct said plant, secured by ULID no. 8 and system revenues. These moneys cover in part the constructing of the city

of Langley secondary sewage treatment plant facility, which was not covered by ULID no. 8 assessments.

C. The charges assessed in this chapter, including the surcharge, were originally intended to be collected during 1992. However, due to administrative oversight, the surcharge was not billed or collected. Accordingly, this chapter authorizes surcharge billing and collection beginning in 1993, on a date set by the city administration. (Ord. 786, 2000)

13.50.340 Mixed usage.

A. Buildings located in land zoned for residential use, which contain both commercial and residential activities (except for bed and breakfast establishments), will be billed as a residential account.

B. Buildings located in land zoned for commercial or neighborhood business use, which contain both commercial and residential activities, will be billed as a commercial account. (Ord. 786, 2000)

13.50.350 Payment – Penalty for failure to pay.

Sewer service charges shall become past due and delinquent 30 service days after the date of mailing, and the date of mailing shall be plainly noted on such bills. If not so paid the city shall have the right to charge the amount owing with accrued interest at the maximum lawful allowable rate. In addition, see Sections 13.50.080 and 13.50.090. (Ord. 786, 2000)

13.50.360 Severability.

If any provision, paragraph, word, section or article of this title is invalidated by any court of competent jurisdiction, the remaining provisions, paragraphs, works, sections and chapters shall not be affected and shall continue in full force and effect. (Ord. 786, 2000)

13.50.370 Conflict.

All other ordinances and parts of other ordinances inconsistent or conflicting with any part of this title are repealed to the extent of such inconsistency or conflict. (Ord. 786, 2000)

Appendix C

NPDES Permit

Issuance Date: July 30, 2014
Effective Date: September 1, 2014
Expiration Date: August 31, 2019

National Pollutant Discharge Elimination System
Waste Discharge Permit No. WA0020702

State of Washington
DEPARTMENT OF ECOLOGY
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq.

City of Langley
P.O. Box 366
Langley, WA 98260

is authorized to discharge in accordance with the Special and General Conditions that follow.

Plant Location:	Receiving Water:
Langley Wastewater Treatment Plant 4999 Coles Road Langley, WA 98260 Island County	Puget Sound – Saratoga Passage
Treatment Type: Sequencing Batch Reactor (Activated Sludge)	

Kevin C. Fitzpatrick
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

Table of Contents

Summary of Permit Report Submittals

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

Permit Section	Submittal	Frequency	First Submittal Date
S3.A	Discharge Monitoring Report	Monthly	October 15, 2014
S3.A	Discharge Monitoring Report	Quarterly	January 15, 2015
S3.A	Discharge Monitoring Report	Annually	January 15, 2015
S3.E	Reporting Permit Violations	As necessary	
S3.F	Other Reporting	As necessary	
S4.B	Plans for Maintaining Adequate Capacity	As necessary	
S4.D	Notification of New or Altered Sources	As necessary	
S4.E	Infiltration and Inflow Evaluation	1/permit cycle	May 15, 2017
S5.F	Bypass Notification	As necessary	
S5.G	Operations and Maintenance Manual Update or Review Confirmation Letter	1/permit cycle	August 31, 2016
S8	Application for Permit Renewal	1/permit cycle	February 28, 2019
G1	Notice of Change in Authorization	As necessary	
G4	Reporting Planned Changes	As necessary	
G5	Engineering Report for Construction or Modification Activities	As necessary	
G7	Notice of Permit Transfer	As necessary	
G10	Duty to Provide Information	As necessary	
G20	Compliance Schedules	As necessary	
G21	Contract Submittal	As necessary	

Special Conditions

S1. Discharge limits

S1.A. Effluent limits

All discharges and activities authorized by this permit must comply with the terms and conditions of this permit. The discharge of any of the following pollutants more frequently than, or at a level in excess of, that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee may discharge treated municipal wastewater to the Saratoga Passage in Puget Sound at the permitted location subject to compliance with the following limits:

Effluent Limits: Outfall No. 001 **Latitude: 48.04389 Longitude: -122.40917**		
Parameter	**Average Monthly [a]**	**Average Weekly [b]**
Biochemical Oxygen Demand (5-day) (BOD_5)	30 milligrams/liter (mg/L) 38 pounds/day (lbs/day) 85% removal of influent BOD_5	45 mg/L 56 lbs/day
Total Suspended Solids (TSS)	30 mg/L 38 lbs/day 85% removal of influent TSS	45 mg/L 56 lbs/day
Total Residual Chlorine	0.5 mg/L	0.75 mg/L
Parameter	**Minimum**	**Maximum**
pH	6.0 standard units	9.0 standard units
Parameter	**Monthly Geometric Mean**	**Weekly Geometric Mean**
Fecal Coliform Bacteria [c]	200/100 milliliter (mL)	400/100 mL

[a]	Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, you add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured. See footnote c for fecal coliform calculations.
[b]	Average weekly discharge limit means the highest allowable average of ”daily discharges” over a calendar week, calculated as the sum of all “daily discharges" measured during a calendar week divided by the number of “daily discharges" measured during that week. See footnote c for fecal coliform calculations.
[c]	Ecology provides directions to calculate the monthly and the weekly geometric mean in publication No. 04-10-020, Information Manual for Treatment Plant Operators available at: http://www.ecy.wa.gov/pubs/0410020.pdf

S1.B. Mixing zone authorization

Mixing zone for outfall no.001

The 12-in diameter outfall pipe ends with a 43.5-foot long diffuser with ten 3-inch ports at 40 feet below mean lower low water (MLLW). The following paragraphs define the maximum boundaries of the mixing zones:

Chronic mixing zone

The allowable chronic mixing zone is 523 feet (159 meters) by 480 feet (146 meters). The mixing zone extends from the discharge ports to the top of the water surface. The concentration of pollutants at the edge of the chronic zone must meet chronic aquatic life criteria and human health criteria.

Acute mixing zone

The allowable acute mixing zone is 91 feet (27.7 meters) by 48 feet (14.6 meters). The mixing zone extends from the discharge ports to the top of the water surface. The concentration of pollutants at the edge of the acute zone must meet acute aquatic life criteria.

Available Dilution (dilution factor)	
Acute Aquatic Life Criteria	133
Chronic Aquatic Life Criteria	203
Human Health Criteria - Carcinogen	203
Human Health Criteria - Non-carcinogen	203

The dimensions and boundaries of the mixing zones are as depicted in Figure 1.

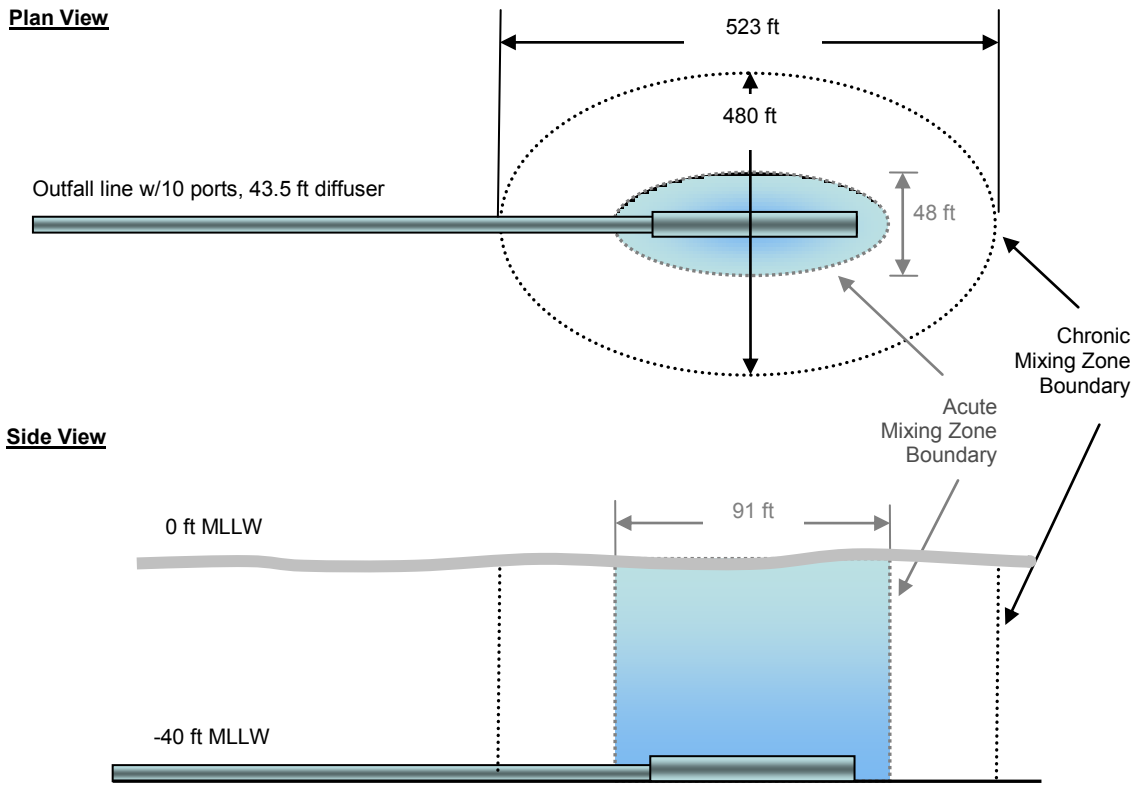


Figure 1. Outfall Mixing Zones

S2. Monitoring requirements

S2.A. Monitoring schedule

The Permittee must monitor in accordance with the following schedule and the requirements specified in Appendix A.

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
(1) Wastewater influent			
Wastewater Influent means the raw sewage flow from the collection system into the treatment facility. Sample the wastewater entering the headworks of the treatment plant excluding any side-stream returns from inside the plant.			
Flow	MGD	Continuous [a]	Metered/recorded
Biochemical Oxygen Demand (5-day) (BOD_5)	mg/L	1/week	24-hr Composite [b]
BOD_5	lbs/day [c]	1/week [d]	Calculated
Total Suspended Solids (TSS)	mg/L	1/week	24-hr Composite
TSS	lbs/day	1/week	Calculated
(2) Final wastewater effluent			
Final Wastewater Effluent means wastewater exiting the last treatment process or operation. Typically, this is after or at the exit from the chlorine contact chamber or other disinfection process. The Permittee may take effluent samples for the BOD_5 analysis before or after the disinfection process. If taken after chlorination, the Permittee must dechlorinate and reseed the sample.			
Flow	MGD	Continuous [a]	Metered/recorded
BOD_5	mg/L	1/week	24-hr Composite [b]
BOD_5	lbs/day [c]	1/week [d]	Calculated
BOD_5	% removal [e]	1/month	Calculated
TSS	mg/L	1/week	24-hr Composite
TSS	lbs/day	1/week	Calculated
TSS	% removal	1/month	Calculated
pH [f]	Standard Units	5/week [g]	Grab
Fecal Coliform [h]	# /100 mL	1/week	Grab concurrently with chlorine samples
Total Residual Chlorine	mg/L	5/week [g]	Grab [i]
Temperature [j]	Degrees centigrade (°C)	5/week [g], June-Oct.	Grab
(3) Effluent characterization – final wastewater effluent			
Total Ammonia	mg/L as N	Quarterly [k]	24-hr Composite
Nitrate plus Nitrite Nitrogen	mg/L as N	Quarterly	24-hr Composite
Total Kjeldahl Nitrogen (TKN)	mg/L as N	Quarterly	24-hr Composite
(4) Permit renewal application requirements – final wastewater effluent			
The Permittee must record and report the wastewater treatment plant flow discharged on the day it collects the sample with the discharge monitoring report.			
Dissolved Oxygen	mg/L	Once per year	Grab
Oil and Grease	mg/L	Once per year	Grab
Phosphorus (Total)	mg/L as P	Once per year	24-hr Composite
Total Dissolved Solids	mg/L	Once per year	24-hr Composite
Total Hardness	mg/L	Once per year	24-hr Composite

[a] Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The Permittee must sample daily when continuous monitoring is not possible.

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type
[b]	24-hour composite means a series of individual samples collected over a 24-hour period into a single container, and analyzed as one sample.		
[c]	Calculated means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in MGD) X Conversion Factor (8.34) = lbs/day		
[d]	1/week means one (1) time during each calendar week.		
[e]	% removal = $\frac{\text{Influent concentration (mg/L)} - \text{Effluent concentration (mg/L)}}{\text{Influent concentration (mg/L)}} \times 100$ Calculate the percent (%) removal of BOD_5 and TSS using the above equation.		
[f]	The Permittee must report the instantaneous maximum and minimum pH daily. Do not average pH values.		
[g]	5/week means five (5) times during each calendar week. One of the sample days per week must include a weekend day.		
[h]	Report a numerical value for fecal coliforms following the procedures in Ecology's *Information Manual for Wastewater Treatment Plant Operators*, Publication Number 04-10-020 available at: http://www.ecy.wa.gov/programs/wq/permits/guidance.html . Do not report a result as too numerous to count (TNTC).		
[i]	Grab means an individual sample collected over a fifteen (15) minute, or less, period.		
[j]	Temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in the afternoon.		
[k]	Quarterly sampling periods are January through March, April through June, July through September, and October through December. The Permittee must begin quarterly monitoring during the 4th quarter of 2014 and submit results for the first quarterly monitoring report by 1/15/15.		

S2.B. Sampling and analytical procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters. The Permittee must conduct representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions that may affect effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136 (or as applicable in 40 CFR subchapters N [Parts 400–471] or O [Parts 501-503]) unless otherwise specified in this permit . Ecology may only specify alternative methods for parameters without permit limits and for those parameters without an EPA approved test method in 40 CFR Part 136.

S2.C. Flow measurement, field measurement, and continuous monitoring devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices.
2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard and the manufacturer's recommendation for that type of device.

3. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.
4. Calibrate flow-monitoring devices at a minimum frequency of at least one calibration per year.
5. Maintain calibration records for at least three years.

S2.D. Laboratory accreditation

The Permittee must ensure that all monitoring data required by Ecology for permit specified parameters is prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement.

S2.E. Request for reduction in monitoring

The Permittee may request a reduction of the sampling frequency after twelve (12) months of monitoring. Ecology will review each request and at its discretion grant the request when it reissues the permit or by a permit modification.

The Permittee must:

1. Provide a written request.
2. Clearly state the parameters for which it is requesting reduced monitoring.
3. Clearly state the justification for the reduction.

S3. Reporting and recording requirements

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

S3.A. Reporting

The first monitoring period begins on the effective date of the permit. The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on the electronic Discharge Monitoring Report (DMR) form provided by Ecology within the Water Quality Permitting Portal. Include data for each of the parameters tabulated in Special Condition S2 and as required by the form. Report a value for each day sampling occurred (unless specifically exempted in the permit) and for the summary values (when applicable) included on the electronic form.

   To find out more information and to sign up for WQWebDMR go to: http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html .

   To find out more information and to sign up for the Water Quality Permitting Portal go to: http://www.ecy.wa.gov/programs/wq/permits/paris/portal.html .

2. Enter the "no discharge" reporting code for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate, if the Permittee did not discharge wastewater or a specific pollutant during a given monitoring period.
3. Report single analytical values below detection as "less than the detection level (DL)" by entering < followed by the numeric value of the detection level (e.g. < 2.0) on the DMR. If the method used did not meet the minimum DL and quantitation level (QL) identified in the permit, report the actual QL and DL in the comments or in the location provided.
4. Report the test method used for analysis in the comments if the laboratory used an alternative method not specified in the permit and as allowed in Appendix A.
5. Calculate average values (unless otherwise specified in the permit) using:
   a. The reported numeric value for all parameters measured between the agency-required detection value and the agency-required quantitation value.
   b. One-half the detection value (for values reported below detection) if the lab detected the parameter in another sample for the reporting period.
   c. Zero (for values reported below detection) if the lab did not detect the parameter in another sample for the reporting period.
6. Report single-sample grouped parameters on the WQWebDMR form and include: sample date, concentration detected, detection limit (DL) (as necessary), and laboratory quantitation level (QL) (as necessary). The Permittee must also submit an electronic PDF copy of the laboratory report using WQWebDMR.

   The contract laboratory reports must also include information on the chain of custody, QA/QC results, and documentation of accreditation for the parameter.
7. Ensure that DMRs are electronically submitted no later than the dates specified below, unless otherwise specified in this permit.
8. Submit DMRs for parameters with the monitoring frequencies specified in S2 (monthly, quarterly, annual, etc.) at the reporting schedule identified below. The Permittee must:
   a. Submit **monthly** DMRs by the 15th day of the following month. The first submittal is October 15, 2014.
   b. Submit **quarterly DMRs**, unless otherwise specified in the permit, by the 15th day of the month following the monitoring period. Quarterly sampling periods are January through March, April through June, July through September, and October through December. The first four quarterly submittals are due by January 15, 2015; April 15, 2015; July 15, 2015; and October 15, 2015.
   c. Submit **annual DMRs**, unless otherwise specified in the permit, by January 15 for the previous calendar year. The annual sampling period is the calendar year. The first submittal is January 15, 2015.
   d. Submit permit renewal application monitoring data as required in Special Condition S2 by February 28, 2019.

9. Submit reports to Ecology online using Ecology's electronic WQWebDMR submittal forms (electronic DMRs) as required above. Send paper reports to Ecology at:

    Water Quality Permit Coordinator
    Department of Ecology
    Northwest Regional Office
    3190 160th Avenue SE
    Bellevue, WA 98008-5452

S3.B. Records retention

The Permittee must retain records of all monitoring information for a minimum of three (3) years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

S3.C. Recording of results

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

S3.D. Additional monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by Special Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR unless otherwise specified by Special Condition S2.

S3.E. Reporting permit violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.
2. If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within thirty (30) days of sampling.

a. Immediate reporting

The Permittee must **immediately** report to Ecology and the Department of Health (DOH), Shellfish Program, and the Island County Health Department (at the numbers listed below), all:

- Failures of the disinfection system.
- Collection system overflows.
- Plant bypasses discharging to marine surface waters.
- Any other failures of the sewage system (pipe breaks, etc.)

Northwest Regional Office	425-649-7000
Department of Health, Shellfish Program	360-236-3330 (business hours) 360-789-8962 (after business hours)
Island County Health Department	360-679-7350 (business hours) 360-914-1452 (after hours)

b. Twenty-four-hour reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at the telephone numbers listed above, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

1. Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.
2. Any unanticipated bypass that causes an exceedance of an effluent limit in the permit (See Part S5.F, "Bypass Procedures").
3. Any upset that causes an exceedance of an effluent limit in the permit (See G.15, "Upset").
4. Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Section S1.A of this permit.
5. Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit.

c. Report within five days

The Permittee must also submit a written report within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The report must contain:

1. A description of the noncompliance and its cause.
2. The period of noncompliance, including exact dates and times.
3. The estimated time the Permittee expects the noncompliance to continue if not yet corrected.

4. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
5. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

d. Waiver of written reports

Ecology may waive the written report required in subpart c, above, on a case-by-case basis upon request if the Permittee has submitted a timely oral report.

e. All other permit violation reporting

The Permittee must report all permit violations, which do not require immediate or within 24 hours reporting, when it submits monitoring reports for S3.A ("Reporting"). The reports must contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

f. Report submittal

The Permittee must submit reports to the address listed in S3.A.

S3.F. Other reporting

a. Spills of oil or hazardous materials

The Permittee must report a spill of oil or hazardous materials in accordance with the requirements of RCW 90.56.280 and chapter 173-303-145 WAC. You can obtain further instructions at the following website: http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm .

b. Failure to submit relevant or correct facts

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

S3.G. Maintaining a copy of this permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. Facility loading

S4.A. Design criteria

The flows or waste loads for the permitted facility must not exceed the following design criteria:

Maximum Month Design Flow (MMDF)	0.15	MGD
BOD_5 Influent Loading for Maximum Month	425	lbs/day
TSS Influent Loading for Maximum Month	425	lbs/day

S4.B. Plans for maintaining adequate capacity

a. Conditions triggering plan submittal

The Permittee must submit a plan and a schedule for continuing to maintain capacity to Ecology when:

1. The actual flow or waste load reaches 85 percent of any one of the design criteria in S4.A for three consecutive months; or
2. The projected plant flow or loading would reach design capacity within five years.

b. Plan and schedule content

The plan and schedule must identify the actions necessary to maintain adequate capacity for the expected population growth and to meet the limits and requirements of the permit. The Permittee must consider the following topics and actions in its plan.

1. Analysis of the present design and proposed process modifications.
2. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system.
3. Limits on future sewer extensions or connections or additional waste loads.
4. Modification or expansion of facilities.
5. Reduction of industrial or commercial flows or waste loads.

Engineering documents associated with the plan must meet the requirements of WAC 173-240-060, "Engineering Report," and be approved by Ecology prior to any construction.

S4.C. Duty to mitigate

The Permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

S4.D. Notification of new or altered sources

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

S4.E. Infiltration and inflow evaluation

1. The Permittee must conduct an infiltration and inflow evaluation. Refer to the U.S. EPA publication, I/I Analysis and Project Certification, available as Ecology's Publication No. 97-03 at: http://www.ecy.wa.gov/programs/wq/permits/guidance.html
2. The Permittee may use monitoring records to assess measurable infiltration and inflow.
3. The Permittee must prepare a report summarizing any measurable infiltration and inflow along with the following:
   a. Service population.
   b. A list of collection system repairs completed during the previous year.
   c. Identification of collection system areas where leaks are known or suspected.
   d. A schedule for conducting collection system inspections to locate leaks not already identified.
   e. A tentative schedule for future collection system repairs.
4. If infiltration and inflow have increased by more than 15 percent from that found in the previous report based on equivalent rainfall, the report must contain a plan and a schedule to locate the sources of infiltration and inflow and to correct the problem.
5. The Permittee must submit a report (once per permit cycle) summarizing the results of the evaluation and any recommendations for corrective actions by May 15, 2017.

S5. Operation and maintenance

The Permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic), adequate laboratory controls, and appropriate quality assurance procedures. This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit.

S5.A. Certified operator

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

S5.B. Operation and maintenance program

The Permittee must:

1. Institute an adequate operation and maintenance program for the entire sewage system.
2. Keep maintenance records on all major electrical and mechanical components of the treatment plant, as well as the sewage system and pumping stations. Such records must clearly specify the frequency and type of maintenance recommended by the manufacturer and must show the frequency and type of maintenance performed.
3. Make maintenance records available for inspection at all times.

S5.C. Short-term reduction

The Permittee must schedule any facility maintenance, which might require interruption of wastewater treatment and degrade effluent quality, during noncritical water quality periods and carry this maintenance out in a manner approved by Ecology.

If a Permittee contemplates a reduction in the level of treatment that would cause a violation of permit discharge limits on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee must:

1. Give written notification to Ecology, if possible, thirty (30) days prior to such activities.
2. Detail the reasons for, length of time of, and the potential effects of the reduced level of treatment.

This notification does not relieve the Permittee of its obligations under this permit.

S5.D. Electrical power failure

The Permittee must ensure that adequate safeguards prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of this permit during electrical power failure at the treatment plant and/or sewage lift stations. Adequate safeguards include, but are not limited to, alternate power sources, standby generator(s), or retention of inadequately treated wastes.

The Permittee must maintain Reliability Class II (EPA 430-99-74-001) at the wastewater treatment plant. Reliability Class II requires a backup power source sufficient to operate all vital components and critical lighting and ventilation during peak wastewater flow conditions. Vital components used to support the secondary processes (i.e., mechanical aerators or aeration basin air compressors) need not be operable to full levels of treatment, but must be sufficient to maintain the biota.

S5.E. Prevent connection of inflow

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

S5.F. Bypass procedures

This permit prohibits a bypass, which is the intentional diversion of waste streams from any portion of a treatment facility. Ecology may take enforcement action against a Permittee for a bypass unless one of the following circumstances (1, 2, or 3) applies.

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

   This permit authorizes a bypass if it allows for essential maintenance and does not have the potential to cause violations of limits or other conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee must submit prior notice, if possible, at least ten (10) days before the date of the bypass.

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

   This permit authorizes such a bypass only if:

   a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

   b. No feasible alternatives to the bypass exist, such as:

      - The use of auxiliary treatment facilities.
      - Retention of untreated wastes.
      - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass.
      - Transport of untreated wastes to another treatment facility or preventative maintenance.

   c. Ecology is properly notified of the bypass as required in Special Condition S3.E of this permit.

3. If bypass is anticipated and has the potential to result in noncompliance of this permit.

   a. The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

      - A description of the bypass and its cause.
      - An analysis of all known alternatives which would eliminate, reduce or mitigate the need for bypassing.
      - A cost-effectiveness analysis of alternatives including comparative resource damage assessment.
      - The minimum and maximum duration of bypass under each alternative.

- A recommendation as to the preferred alternative for conducting the bypass.
- The projected date of bypass initiation.
- A statement of compliance with SEPA.
- A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
- Details of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during preparation of the engineering report or facilities plan and plans and specifications and must include these to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.

c. Ecology will consider the following prior to issuing an administrative order for this type of bypass:

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

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve or deny the request. Ecology will give the public an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Ecology will approve a request to bypass by issuing an administrative order under RCW 90.48.120.

S5.G. Operations and maintenance (O&M) manual

a. O&M manual submittal and requirements

The Permittee must:

1. Review the operations and maintenance (O&M) manual and confirm this review by submitting a letter to Ecology by August 31, 2016. When treatment processes or equipment have significant changes or upgrades the permittee shall update the O&M manual that meets the requirements of 173-240-080 WAC and submit it to Ecology for approval. The Permittee must submit a paper copy and an electronic copy (preferably as a PDF).

2. Keep the approved O&M manual at the permitted facility.
3. Follow the instructions and procedures of this manual.

b. O&M manual components

In addition to the requirements of WAC 173-240-080 (1) through (5), the O&M manual must include:

1. Emergency procedures for cleanup in the event of wastewater system upset or failure.
2. A review of system components which if failed could pollute surface water or could impact human health. Provide a procedure for a routine schedule of checking the function of these components.
3. Wastewater system maintenance procedures that contribute to the generation of process wastewater.
4. Reporting protocols for submitting reports to Ecology to comply with the reporting requirements in the discharge permit.
5. Any directions to maintenance staff when cleaning or maintaining other equipment or performing other tasks which are necessary to protect the operation of the wastewater system (for example, defining maximum allowable discharge rate for draining a tank, blocking all floor drains before beginning the overhaul of a stationary engine).
6. The treatment plant process control monitoring schedule.
7. Minimum staffing adequate to operate and maintain the treatment processes and carry out compliance monitoring required by the permit.
8. Specify other items on case-by-case basis such as O&M for collection systems pump stations, lagoon liners, etc.

S6. Pretreatment

S6.A. General requirements

The Permittee must work with Ecology to ensure that all commercial and industrial users of the publicly owned treatment works (POTW) comply with the pretreatment regulations in 40 CFR Part 403 and any additional regulations that the Environmental Protection Agency (U.S. EPA) may promulgate under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act.

S6.B. Duty to enforce discharge prohibitions

1. Under federal regulations (40 CFR 403.5(a) and (b)), the Permittee must not authorize or knowingly allow the discharge of any pollutants into its POTW which may be reasonably expected to cause pass through or interference, or which otherwise violate general or specific discharge prohibitions contained in 40 CFR Part 403.5 or WAC 173-216-060.
2. The Permittee must not authorize or knowingly allow the introduction of any of the following into their treatment works:

a. Pollutants which create a fire or explosion hazard in the POTW (including, but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21).

b. Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, or greater than 11.0 standard units, unless the works are specifically designed to accommodate such discharges.

c. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.

d. Any pollutant, including oxygen-demanding pollutants, (BOD_5, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

e. Petroleum oil, non-biodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.

f. Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity which may cause acute worker health and safety problems.

g. Heat in amounts that will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities such that the temperature at the POTW headworks exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless Ecology, upon request of the Permittee, approves, in writing, alternate temperature limits.

h. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.

i. Wastewaters prohibited to be discharged to the POTW by the Dangerous Waste Regulations (chapter 173-303 WAC), unless authorized under the Domestic Sewage Exclusion (WAC 173-303-071).

3. The Permittee must also not allow the following discharges to the POTW unless approved in writing by Ecology:

   a. Noncontact cooling water in significant volumes.

   b. Stormwater and other direct inflow sources.

   c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment, or would not be afforded a significant degree of treatment by the system.

4. The Permittee must notify Ecology if any industrial user violates the prohibitions listed in this section (S6.B), and initiate enforcement action to promptly curtail any such discharge.

S6.C. Wastewater discharge permit required

The Permittee must:

1. Establish a process for authorizing non-domestic wastewater discharges that ensures all significant industrial users (SIUs) in all tributary areas meet the applicable state waste discharge permit (SWDP) requirements in accordance with chapter 90.48 RCW and chapter 173-216 WAC.
2. Immediately notify Ecology of any proposed discharge of wastewater from a source, which may be a SIU [see fact sheet definitions or refer to 40 CFR 403.3(v)(i)(ii)].
3. Require all SIUs to obtain a SWDP from Ecology prior to accepting their nondomestic wastewater, or require proof that Ecology has determined they do not require a permit.
4. Require the documentation as described in S6.C.3 at the earliest practicable date as a condition of continuing to accept non-domestic wastewater discharges from a previously undiscovered, currently discharging and unpermitted SIU.
5. Require sources of non-domestic wastewater, which do not qualify as SIUs but merit a degree of oversight, to apply for a SWDP and provide it a copy of the application and any Ecology responses.
6. Keep all records documenting that its users have met the requirements of S6.C.

S6.D. Identification and reporting of existing, new, and proposed industrial users

1. The Permittee must take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging or proposing to discharge to the Permittee's sewer system (see Appendix C of the fact sheet for definitions).
2. Within 30 days of becoming aware of an unpermitted existing, new, or proposed industrial user who may be a significant industrial user (SIU), the Permittee must notify such user by registered mail that, if classified as an SIU, they must apply to Ecology and obtain a State Waste Discharge Permit. The Permittee must send a copy of this notification letter to Ecology within this same 30-day period.
3. The Permittee must also notify all Potential SIUs (PSIUs), as they are identified, that if their classification should change to an SIU, they must apply to Ecology for a State Waste Discharge Permit within 30 days of such change.

S7. Solid wastes

S7.A. Solid waste handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

S7.B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

S8. Application for permit renewal or modification for facility changes

The Permittee must submit an application for renewal of this permit by February 28, 2019. The Permittee must submit a paper copy and an electronic copy (preferably as a PDF).

The Permittee must also submit a new application or supplement at least one hundred eighty (180) days prior to commencement of discharges, resulting from the activities listed below, which may result in permit violations. These activities include any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility.

General Conditions

G1. Signatory requirements

1. All applications, reports, or information submitted to Ecology must be signed and certified.
   a. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
      - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or
      - The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
   b. In the case of a partnership, by a general partner.
   c. In the case of sole proprietorship, by the proprietor.
   d. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

   Applications for permits for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.
2. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
   a. The authorization is made in writing by a person described above and submitted to Ecology.
   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
3. Changes to authorization. If an authorization under paragraph G1.2, above, is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G1.2, above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section must make the following certification:

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

G2. Right of inspection and entry

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

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

G3. Permit actions

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

1. The following are causes for terminating this permit during its term, or for denying a permit renewal application:
   a. Violation of any permit term or condition.
   b. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.
   c. A material change in quantity or type of waste disposal.
   d. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination.

e. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.

f. Nonpayment of fees assessed pursuant to RCW 90.48.465.

g. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.

2. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:

   a. A material change in the condition of the waters of the state.

   b. New information not available at the time of permit issuance that would have justified the application of different permit conditions.

   c. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.

   d. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.

   e. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.

   f. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.

   g. Incorporation of an approved local pretreatment program into a municipality's permit.

3. The following are causes for modification or alternatively revocation and reissuance:

   a. When cause exists for termination for reasons listed in 1.a through 1,g of this section, and Ecology determines that modification or revocation and reissuance is appropriate.

   b. When Ecology has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G7) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new Permittee.

G4. Reporting planned changes

The Permittee must, as soon as possible, but no later than one hundred eighty (180) days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

1. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).

2. A significant change in the nature or an increase in quantity of pollutants discharged.

3. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of a new application or supplement to the existing application, along with required engineering plans and reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. Plan review required

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

G6. Compliance with other laws and statutes

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. Transfer of this permit

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

1. Transfers by Modification

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

2. Automatic Transfers

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

   a. The Permittee notifies Ecology at least thirty (30) days in advance of the proposed transfer date.

   b. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.

   c. Ecology does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. Reduced production for compliance

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

G9. Removed substances

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

G10. Duty to provide information

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. Other requirements of 40 CFR

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

G12. Additional monitoring

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

G13. Payment of fees

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

G14. Penalties for violating permit conditions

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

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

G15. Upset

Definition – “Upset” means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

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

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that the Permittee can identify the cause(s) of the upset.
2. The permitted facility was being properly operated at the time of the upset.
3. The Permittee submitted notice of the upset as required in Special Condition S3.E.
4. The Permittee complied with any remedial measures required under S3.E of this permit.

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

G16. Property rights

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

G17. Duty to comply

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

G18. Toxic pollutants

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

G19. Penalties for tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two (2) years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four (4) years, or by both.

G20. Compliance schedules

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

G21. Service agreement review

The Permittee must submit to Ecology any proposed service agreements and proposed revisions or updates to existing agreements for the operation of any wastewater treatment facility covered by this permit. The review is to ensure consistency with chapters 90.46 and 90.48 RCW as required by RCW 70.150.040(9). In the event that Ecology does not comment within a thirty-day (30) period, the Permittee may assume consistency and proceed with the service agreement or the revised/updated service agreement.

Appendix A

LIST OF POLLUTANTS WITH ANALYTICAL METHODS, DETECTION LIMITS AND QUANTITATION LEVELS

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.

Ecology added this appendix to the permit in order to reduce the number of analytical "non-detects" in permit-required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost.

CONVENTIONAL PARAMETERS

Pollutant & CAS No. *(if available)*	**Recommended Analytical Protocol**	**Detection (DL)[1]** *µg/L unless specified*	**Quantitation Level (QL)[2]** *µg/L unless specified*
Biochemical Oxygen Demand	SM5210-B		2 mg/L
Total Suspended Solids	SM2540-D		5 mg/L
Total Ammonia (as N)	SM4500-NH3-B and C/D/E/G/H		20
Flow	Calibrated device		
Dissolved oxygen	SM4500-OC/OG		0.2 mg/L
Temperature (max. 7-day avg.)	Analog recorder or Use micro-recording devices known as thermistors		0.2º C
pH	SM4500-H^+ B	N/A	N/A

NONCONVENTIONAL PARAMETERS

Pollutant & CAS No. *(if available)*	**Recommended Analytical Protocol**	**Detection (DL)[1]** *µg/L unless specified*	**Quantitation Level (QL)[2]** *µg/L unless specified*
Total Alkalinity	SM2320-B		5 mg/L as CaCO3
Chlorine, Total Residual	SM4500 Cl G		50.0
Fecal Coliform	SM 9221E,9222	N/A	Specified in method - sample aliquot dependent
Nitrate + Nitrite Nitrogen (as N)	SM4500-NO3- E/F/H		100
Nitrogen, Total Kjeldahl (as N)	SM4500-N_{org}B/C and SM4500NH_3-B/C/D/EF/G/H		300

Pollutant & CAS No. *(if available)*	**Recommended Analytical Protocol**	**Detection (DL)[1]** *µg/L unless specified*	**Quantitation Level (QL)[2]** *µg/L unless specified*
Soluble Reactive Phosphorus (as P)	SM4500- PE/PF	3	10
Phosphorus, Total (as P)	SM 4500 PB followed by SM4500-PE/PF	3	10
Oil and Grease (HEM) (Hexane Extractable Material)	1664 A or B	1,400	5,000
Settleable Solids	SM2540 -F		500 (or 0.1 mL/L)
Total Dissolved Solids	SM2540 C		20 mg/L
Total Hardness	SM2340B		200 as CaCO3

1. Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.

2. Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to (1, 2, or 5) x 10^n, where n is an integer (64 FR 30417).
   ALSO GIVEN AS:
   The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency, December 2007).

Appendix D

Interlocal Agreement

Debbie

INTERLOCAL AGREEMENT BETWEEN ISLAND COUNTY AND THE CITY OF LANGLEY, WASHINGTON

This Agreement is hereby entered into by Island County, a political subdivision of the State of Washington, and the City of Langley, a municipal corporation of the State of Washington.

WHEREAS, RCW 36.70A.210, the Washington State Growth Management Act of 1990, as amended requires each County planning under the Act to adopt a county-wide planning policy (CWPP) in cooperation with cities located in whole or in part within the county, and

WHEREAS, RCW 36.70A.210, the Washington State Growth Management Act of 1990, as amended requires the CWPP shall at a minimum address policies to implement RCW 36.70A.110; and

WHEREAS, RCW 36.70A.110, the Washington State Growth Management Act of 1990, as amended requires each County planning under the Act to designate the location of an urban growth area or areas (UGA); and

WHEREAS, Chapter 39.34 RCW, the Interlocal Cooperation Act, authorizes the County and the City of Langley to enter into agreements that allow governmental entities to make the most efficient use of their powers to allow the implementation of the requirements of the Growth Management Act; and

WHEREAS, Island County has adopted and the City of Langley has ratified CWPP's attached hereto as Exhibit A; and

WHEREAS, Island County and the City of Langley have adopted an Urban Growth Area (UGA) and a Joint Planning Area (JPA) as indicated on the City of Langley Comprehensive Plan Map and attached hereto as Exhibit B, within which planning will be coordinated; and

WHEREAS, Island County and the City of Langley have agreed to revise the UGA Area boundary to accommodate projected growth to the year 2020 ; and

WHEREAS, the UGA for the City of Langley contains land area now located in the unincorporated portion of Island County for which the City has established land use and zoning classifications; and

WHEREAS, for unincorporated land area within the UGA, the County has portrayed the City Zoning as a potential zone in the County's Zoning Atlas; and

WHEREAS, Island County and the City of Langley now desire to jointly establish and implement policies and procedures governing the annexation by the City of properties within the unincorporated area of the UGA; and

WHEREAS, Island County and the City of Langley now desire to jointly establish and implement development regulations and procedures governing the review and approval of subdivision, short subdivision and conditional land use permits within the unincorporated portion of the UGA; and

WHEREAS, Island County and the City of Langley now desire to jointly establish and implement policies and procedures governing the provision of public facilities and utilities within the unincorporated portions of the UGA; and

WHEREAS, Island County and the City of Langley now desire to jointly establish policies governing planning and the review and approval of subdivision, short subdivision and conditional use permits within the JPA to not preclude the expansion of Langley's UGA.

NOW THEREFORE, Island County, hereinafter called "County" and the City of Langley, hereinafter called "City" hereby agree as follows:

I. PURPOSE

A. This Agreement between Island County and the City of Langley is intended to promote and provide guidance for the orderly growth and management of the physical development of the City of Langley Urban Growth Area and the surrounding Joint Planning Area. For purposes of this Agreement, development is defined as the subdivisions, short subdivisions of land and conditional uses.

B. The City of Langley has adopted, and the County has approved, a final Urban Growth Area designed to accommodate population growth to the year 2010 (Exhibit B). Through County Wide Planning Policies (CWPP), population projections have been adopted for the City of Langley for the year 2020 (Exhibit A). The City and the County jointly agree to plan on a collaborative basis to accommodate the Langley-oriented urban population growth that will occur in the immediate environs outside the Langley UGA between the year 2010 and the year 2020 by revising the UGA boundary.

C. The County acknowledges, and the City concurs, that the unincorporated area of the UGA will be annexed by the City in a timely and orderly fashion. The County acknowledges, and the City concurs, that the zoning governing new urban land development in the unincorporated area of the UGA and contained in Appendix C has been formulated to produce

development consistent with a municipal development pattern and to promote the economic provision of urban governmental services by the City. This new zoning classification, UGA-Langley, shall replace existing zoning for lands within the unincorporated portion of the Langley UGA.

D. The City, as the provider of urban governmental services, acknowledges that planning for and the timely provision/extension of urban governmental services is a paramount prerequisite to facilitating the urban development of the UGA.

E. The County further acknowledges, and the City concurs, that subdivision or short subdivision of the property within or immediately bordering the UGA must not create isolated pockets of urban density development or permit permanent large lot development that will prevent urban development or future expansion of the UGA. The County agrees to establish and administer land development regulations that will foster future development of such areas at urban densities.

F. The City and the County further acknowledge that the Growth Management Act requires that future urban growth must first be located within existing UGAs. The City and County hereby agree to enact and maintain development regulations that will encourage and require new development of urban uses and densities within the UGA in accordance with population projections and allocations as set forth in the CWPP's adopted jointly by the City and the County.

G. This Agreement between the County and the City of Langley is intended to establish a revised UGA boundary to allow for the orderly expansion of the Langley UGA to accommodate the 2020 population forecast for Langley established in CWPPs.

H. This Agreement between the County and the City of Langley is intended to establish policies to coordinate planning within the JPA so that land use decisions of the County do not preclude the expansion of the UGA.

II. POLICIES AND PROCEDURES FOR THE ANNEXATION OF PROPERTIES WITHIN THE UNINCORPORATED AREA OF THE UGA.

A. The County and City recognize that all of the unincorporated portion of the Langley UGA will eventually annex to the City, subject to the City's ability to provide urban governmental services. The City commits to annex any property contiguous to the City's municipal boundary when presented with a completed Annexation/Development Agreement as provided for in Section III, below within 120 days.

B. The City shall incorporate in any annexation all critical areas designated by the County and other areas set aside or regulated as open spaces for buffers or community open space when such areas fall within the boundary of the area subject to annexation.

III. DEVELOPMENT STANDARDS AND PROCEDURES FOR THE UNINCORPORATED AREA OF THE UGA.

A. Property contiguous to City's municipal boundaries and upon which a building permit or development is proposed shall be required to annex to the City prior to or in conjunction with development approval by the City and shall comply with City zoning and development standards.

B. In the event that the City does not annex the property within 120 days of the execution of an Annexation/Development Agreement (Exhibit D) and the receipt of a petition to annex, the County zoning regulations (UGA-L) (Exhibit C), shall govern the allowable land uses and densities.

C. For property within the unincorporated portion of the City's UGA that is not contiguous to the City's municipal boundary, the County shall apply the requirements of the County UGA-L zone classification as provided in Exhibit C.

D. The County shall require Pre-Application Conferences for all development of property within the unincorporated portion of City's UGA that is not contiguous to the City's municipal boundary and shall give the City notice of and invite City Staff to participate in all such conferences. Any written comments provided by the City received at or prior to the conference will be forwarded to the potential applicant.

E. No application for development within the unincorporated portion of the City's UGA will be considered complete until an Annexation/Development Agreement (Exhibit D.) is executed by the Applicant. All complete applications for development within the unincorporated portion of the City's UGA that is not contiguous to the City's municipal boundary shall be forwarded to the City as provided in ICC 16.19.120 for review and comment during the public comment period provided for in Chapter 16.19 ICC.

F. For development within the unincorporated portion of the UGA, the County and the City are "co-lead" agencies, pursuant to Chapter 197-11 WAC, with the County named "nominal lead" and responsible for complying with the procedural requirements of SEPA.

G. For development within the areas defined as scenic corridors in the Langley UGA, the overlay zones and standards contained in Appendix B. shall be applied.

IV. EXPANSION OF THE URBAN GROWTH AREA

Within ninety days of the date of execution of this document, the City will prepare alternatives for addition to the City's Urban Growth Area to accommodate the additional UGA population projected for the UGA by the CWPPs. The County agrees to work cooperatively with the City in public presentations on the additions to the City's UGA. The County will adopt the addition proposed by the City as an amendment to the County Comprehensive Plan. Upon adoption, the area shall be subject to the regulations contained in Section III of this agreement.

V. DEVELOPMENT STANDARDS AND PROCEDURES FOR THE JOINT PLANNING AREA.

A. The County shall require Pre-Application Conferences for all development of property within the Joint Planning Area and shall give the City notice of and invite City Staff to participate in all such conferences. Any written comments provided by the City received at or prior to the conference will be forwarded to the potential applicant.

B. All complete Type III applications within the JPA shall be forwarded to the City as provided in ICC 16.19.120 for review and comment during the public comment period provided for in Chapter 16.19 ICC.

C. If requested by the City for development (as defined herein), the County will require as a condition of land use approval that the applicant execute a Pre-Annexation/Development Agreement (Exhibit D).

D. For development within the areas defined as scenic corridors in the Langley JPA, the overlay zone and standards contained in Exhibit B shall be applied.

VI. POLICIES AND PROCEDURES FOR PROVISION OF PUBLIC FACILITIES AND UTILITIES WITHIN THE UNINCORPORATED AREA OF THE UGA.

A. The City and County recognize mutual responsibility for capital facility planning in the unincorporated urban growth area. As part of urban growth area planning, the City and County agree to prepare coordinated Capital Facilities Plans for the unincorporated Urban Growth Area, including any revision thereof, within 120 days of the date of execution of this Agreement. These plans will identify the Capital Facilities needed to serve the area's current and anticipated population, consistent with level of

service standards adopted by the City and the County. The City is solely responsible for the planning and provision of water and sanitary sewer planning. The City and the County shall be jointly responsible for the planning of transportation and stormwater facilities in the UGA.

B. The City's Capital Facilities Plan will provide for financing and the phased construction of road, sanitary sewer, stormwater and water facilities necessary to support urban development within the incorporated and unincorporated areas of the UGA, consistent with the requirements of the Growth Management Act.

VII. REVISION OF COUNTY REGULATIONS

This Agreement requires the County to modify its zoning code to create a new Urban Growth Area Zone for the Langley UGA (Exhibit C). The County will complete the adoption of this zoning code amendment as well as any needed revisions to land use procedures within ninety (90) days of the execution of this Agreement.

VIII. RELATIONSHIP TO EXISTING LAWS AND STATUTES

Unless expressly provided otherwise in this Agreement this Agreement is not intended to modify or supersede existing laws and statutes and shall be construed in a manner, which is consistent therewith. In meeting the commitments encompassed in this Agreement all parties will comply with the requirements of the statutes, rules and regulations governing planning and zoning, land division, annexation, open meetings, environmental policy, growth management, the Island County County-wide Planning Policy, the Comprehensive Plans of Island County and the City of Langley and any other applicable federal, state or local laws and regulations.

IX. AMENDMENTS

This Agreement may be amended from time to time by written amendment. All amendments must be agreed to by the City and County. Amendments shall be adopted in the same manner as the original execution of this Agreement. Any Comprehensive Plan or Development Regulation amendment of either the County or the City that affects lands within the JPA or UGA shall not be effective for these areas until any needed amendment to this Agreement has been executed.

X. DURATION AND TERMINATION

This Agreement shall be adopted and take effect on or before 7/9/99 and shall remain in effect until terminated by written agreement of both parties at any time or upon either party's providing sixty days written notice of termination to the other party. This document is not retroactive.

XI. FINANCIAL RESPONSIBILITY

Each party shall bear financial responsibility for its own respective share of work performed pursuant to this Agreement.

XII. SEVERABILITY

In the event that any provision of this Agreement is declared invalid or illegal, such declaration shall in no way affect or invalidate any other provision thereof, and such other provisions shall remain in full force and effect.

XIII. INDEMNIFICATION

A. The County shall indemnify and hold harmless the City and its officers, agents and employees, or an of them from any and all claims, actions, suits, liability, loss, costs, expenses and damages of any nature whatsoever, by reason of or arising out of any negligent act or omission of the County, its officers, agents and employees, or any of them, in the performance of this Agreement. In the event that any such suit based upon such a claim, action, loss or damage is brought against the City, the County shall defend the same at its sole cost and expense; provided that the City reserves the right to participate in such suit if any principle of governmental or public laws is involved. If final judgment be rendered against the City and its officers, agents and employees, or any of them, or jointly against the City and the County and their respective officers, agents and employees, or any of them, the County shall satisfy same.

B. In executing this Agreement, the County does not assume liability or responsibility for, or in any way release the City from liability or responsibility which arises in whole or in part from the existence or effect of City ordinances, rules or regulations. If any cause, claim, suit, action or administrative proceeding is commenced in which the enforceability and/or validity of any such City ordinance, rule or regulation is at issue, the City shall defend the same at its sole expense and if judgment is entered or damages are awarded against the City, the County, or both, the City shall satisfy the same, including all chargeable costs and attorney's fees.

C. The City shall indemnify and hold harmless the County and its officers, agents and employees, or an of them from any and all claims, actions, suits, liability, loss, costs, expenses and damages of any nature whatsoever, by reason of or arising out of any negligent act or omission of the City, its officers, agents and employees, or any of them, in the performance of this Agreement. In the event that any such suit based upon such a claim, action, loss or damage is brought against the County, the City shall defend the same at its sole cost and expense; provided that the County reserves the right to participate in such suit if any principle of governmental or public

laws is involved. If final judgment be rendered against the County and its officers, agents and employees, or any of them, or jointly against the City and the County and their respective officers, agents and employees, or any of them, the City shall satisfy same.

D. In executing this Agreement, the City does not assume liability or responsibility for, or in any way release the County from liability or responsibility which arises in whole or in part from the existence or effect of County ordinances, rules or regulations. If any cause, claim, suit, action or administrative proceeding is commenced in which the enforceability and/or validity of any such County ordinance, rule or regulation is at issue, the County shall defend the same at its sole expense and if judgment is entered or damages are awarded against the City, the County, or both, the County shall satisfy the same, including all chargeable costs and attorney's fees.

XIV. ADMINISTRATION

A. The provisions of this Agreement shall be managed by the County Planning Director, and the City Planning Official.

B. The County Planning Director and Planning Official shall meet as necessary to ensure that the provisions of this Agreement are fulfilled and will develop further policies and procedures as are required, and will maintain records of all actions as required to accomplish the work of the Agreement.

C. Administration of this Agreement will be by consensus. In the event consensus cannot be reached by the County Planning Director and City Planning Official, remaining issues will be forwarded to the respective legislative bodies of the parties for resolution.

ISLAND COUNTY	CITY OF LANGLEY
6/28/99	
6/28/99	
~~Chairman~~, Board of Island County Commissioners	Mayor

EXHIBITS

A. Countywide Planning Policies

B. Scenic Corridor Overlay Zone Standards & City of Langley Comprehensive Plan Map

C. Proposed – UGA-Langley Zone (UGA-L)

D. Model Annexation/Development Agreement

EXHIBIT A

COUNTY WIDE PLANNING POLICIES
ANALYSIS OF FISCAL IMPACTS

RCW 36.70A.210 required that each county required to plan under the Growth Management Act (and the cities therein), develop and adopt a series of mutually agreed upon County-wide planning policies. These policies will establish a framework for the local adoption of comprehensive plans and development regulations. They will also provide the foundation for meeting County-wide determined (vs. State determined) consistency criteria as required by the Growth Management Act. These policies are not the equivalent of a regional comprehensive plan. The legislative direction is to develop policy statements to be used solely for the purpose of attaining consistency among plans of the County and the Municipalities.

It is therefore the opinion of the Planning Officials of the Municipalities and the County that the County-Wide Planning Policies, in themselves, have no fiscal impact and are an agreed- upon method of guiding the planning activities required by the Growth Management Act. We recognize that as the Growth Management Act and these policies are implemented to their maximum extent, County Government may lose some tax base needed to operate essential services which serve both the County and Municipalities. To compensate for this, legislation may be required to provide tax base sharing. Neither the fiscal impacts of implementing the Growth Management Act itself nor development of land use plans and development regulations necessary to implement the GMA are addressed herein.

POLICY #1

POLICIES TO IMPLEMENT RCW 36.70A.110 i.e. URBAN GROWTH AREAS

It is the policy of the County and the Municipalities to:

1. Cooperatively and jointly designate municipal Urban Growth Area (UGA) boundaries. The designation of UGA boundaries beyond the existing limits of incorporation of a municipality should be based on a demonstration by the municipalities that public facilities and service capacities either already exist or are planned for and can be efficiently, economically, and practicably provided by either public or private sources;

2. Provide new municipal public works facilities only within, and not beyond Urban Growth Areas. Such facilities include:

   a) Streets, bridges and sidewalks built to municipal standards,

   b) Water storage, transmission and treatment facilities,

   c) Sanitary sewer collection and treatment facilities, and

   d) Storm sewer collection and treatment facilities.

   Two exceptions are contemplated:

   The provision of municipal water service by "Purveyors" whether municipal or private, throughout he unincorporated County as needed to implement the County's "Coordinated Water System Plan", and "Groundwater Management Plan"; and

   The siting of essential public facilities;

3. promote the retention of the overall rural character of the County by

   a) Including sufficient area within any UGA to accommodate anticipated growth and avoid market constraints that induce leapfrogging development, and

   b) Establishing zoning classifications that preserve rural character and foster long term rural development;

4. Enter into Interlocal Agreements (County and each City/Town) for expeditious, concurrent, and cost effective joint review of development proposals and public projects in the UGAs, with final approvals continuing to reside with the County for areas outside of City limits;

5. Fully and cooperatively implement the County-Wide Planning Policies with the understanding that redress to all parties is available pursuant to the Growth Management Act. Since the County-Wide Planning Policies serve as the framework for the development and adoption of the County and municipal comprehensive plans to ensure consistency as required in RCW 36.70A.100, it is not anticipated that an amendment to the County-Wide

Planning Policies will be necessary. However, in the unlikely event that the County, in collaboration with the municipalities, determines in conjunction with the development of their comprehensive plans that an amendment to the County-Wide Planning Policies is necessary to achieve the goals of the Growth Management Act as stated in RCW 326.70A.020, the Board of Island County Commissioners may amend the County-Wide Planning Policies in the same manner as their original adoption.

6. For the purposes of these policies, the term "Urban Growth Area" includes both the incorporated land and the surrounding unincorporated area that is planned to accommodate future urban development. Unincorporated areas of the County not contiguous to an incorporated area may be designated as an UGA upon the adoption of a UGA plan that demonstrates how public facilities and services are, or will be, provided consistent with the requirements of the GMA.

7. The County and the Municipalities recognize that Clinton and Freeland have many urban characteristics and that it may be appropriate to designate these areas as urban growth areas. Therefore, before the end of 1998, the County shall initiate a sub-area planning process to determine potential UGA boundaries; the urban land use designations for these areas; and the capital facilities that are necessary to provide urban services. It is anticipated that recommendations will be ready for consideration by the County prior to the County's second annual review of its Comprehensive Plan in the year 2000.

8. The County and the Municipalities recognize that designated municipal UGA's may need to be expanded in the future and agree to cooperatively and jointly designate UGA expansion areas for each municipal Urban Growth Area.

POLICY #2

POLICIES FOR SITING ESSENTIAL PUBLIC FACILITIES OF A COUNTY OR STATE WIDE SIGNIFICANCE

It is the policy of the County and the Municipalities that:

1. Provision shall be made in the County's and Municipalities' development regulations for siting important and essential public or quasi-public facilities of County or State-wide significance. Examples include, but are not limited to, airports, state education facilities, solid waste handling facilities, and public and private utilities. The objective is to achieve interjurisdictional consistency in these regulations;

2. Siting requirements will be important factors in determining whether essential public facilities will be located in urban, growth or in rural areas. Siting requirements for County facilities within UGAs will be jointly and cooperatively established with the municipalities;

3. Essential public facilities should not be located in Resource Lands and Critical Areas unless there is a demonstrated need and no alternative siting options are reasonable/feasible. Siting of essential Public Facilities within Resource and Critical Lands must be consistent with the Comprehensive Plans of the County and Municipalities and must be compatible with adjacent land use and consistent with development regulations adopted pursuant to RCW 36.70A;

4. Essential public facilities sited outside of urban and urban growth areas must be self-supporting and not require the extension of Municipal urban services and facilities; and

5. The siting of major energy facilities, including throughput transmission facilities, shall not be considered essential public facilities and therefore, comprehensive plans, development regulations and local policies will apply to the siting of such facilities;

POLICY #3

POLICIES FOR JOINT COUNTY/MUNICIPALITY PLANNING

It is the policy of the county and the Municipalities that cooperative planning will be performed under the following policies:

1. The Municipalities and the County will commence the process for major revision of their Comprehensive Plans for a planning horizon of 2025 no later than 2005. Population projection allocations between the Municipalities and the County will be re-evaluated during this review and will be finalized during the preparation of revised County and Municipality Comprehensive Plans to be adopted in 2006.

2. The Municipalities and the County should coordinate capital facilities planning and funding within UGAs. Cooperative effort is best suited to this level of planning and development because many capital facilities and public services, i.e. parks, public and private utilities, youth services, senior services, drainage and transportation facilities are regional in nature. Facility design and construction standards within the UGA shall be established cooperatively with the adjacent city to assure consistency; and

3. The County and Municipalities should also coordinate where appropriate, the development and implementation of long-range plans for youth services, senior services, fire protection, police services, air quality, transportation, solid waste, public and private utilities, and environmental plans such as watershed action and stormwater management plans.

4. The County and the Municipalities, in coordination with the Department of Ecology, have previously adopted a Ground Water Management Plan which provides for the protection of the quality and quantity of ground water used for public water supplies.

5. The County and the Municipalities will develop a list of benchmarks* and establish a monitoring program for changes in growth trends using measurable indicators.

* such as population, employment, geographic distribution of new land use and development

POLICY #4

POLICIES FOR COUNTY-WIDE ECONOMIC DEVELOPMENT AND EMPLOYMENT

To ensure future economic vitality, broaden employment opportunities and meet the needs of projected growth while retaining a high-quality environment, it is the policy of the County and the Municipalities that:

1. Economic growth should be encouraged within the capacities of the County's natural resources, public services and public facilities;

2. A joint comprehensive economic development plan aimed at diversifying the economy in appropriate areas of the County should be formulated. Economic development should implement and be consistent with the Comprehensive Land Use and Capital Facilities Plans. The plan should:

    a. Consider the goods, services and employment requirements of existing and projected population;

    b. Identify the siting requirements of businesses which have the highest probability of economic success in Island County and the least negative impact on the quality of life;

    c. Based on citizen input, existing land use patterns and local capacity (geographic, environmental and other considerations), determine areas suitable for desirable retail, commercial and industrial uses; and

    d. Encourage expansion of the tax base to support the infrastructure and services required by a growing population;

3. Future retail/commercial/industrial development should be encouraged in urban or commercial centers as identified in the Comprehensive Plan of the County and Municipalities;

4. Land use regulations and infrastructure plans of the County and Municipalities should be amended or developed as necessary to implement the economic development plan;

5. Economic development in the four geographic regions of the County, i.e. North, Central and South Whidbey and Camano Island should proceed in a coordinated, but independent, fashion consistent with the Comprehensive Plans of the County and Municipalities; and

1. The County and the Municipalities will seek the participation and cooperation of Port Districts within areas of overlapping responsibility/jurisdiction.

POLICY #5

POLICIES FOR PROMOTING CONTIGUOUS AND ORDERLY DEVELOPMENT AND PROVIDING URBAN SERVICES TO SUCH DEVELOPMENT

It is the policy of the County and the Municipalities that developments within Municipal Urban Growth Areas (UGAs) will be contiguous, orderly and coordinated between the County and Municipalities' governments and utility service providers through the following policies:

1. The first preference for urban development is within municipal boundaries. The second preference for urban development is within areas annexed to municipalities in the UGA;

2. Non-urban development in the UGA should be discouraged. Non- urban development in the UGA should only be allowed if such development will be compatible with future urban development;

3. Through interlocal agreements as provided in Policy 5.6 below, governing entities shall require development in the unincorporated area of the municipal UGA to comply with the following:

   a. If the area is contiguous to the municipal boundary to:

      (1) Annex to the municipality, or

      (2) If authorized by the municipality,

         (a) Execute an annexation/development agreement prior to development approval, and

         (b) Develop at urban density or uses, and

         (c) Submit a site development plan showing ultimate development of the lot or parcel(s) consistent with the potential applicable municipal zoning and development standards.

   b. If the area is not contiguous to the municipality,

      (1) Execute an annexation/development agreement prior to development approval,

      (2) Develop at the densities and uses established in the interlocal agreement adopted by the municipality and the County, and

      (3) Submit a site development plan showing ultimate development of the lot or parcel(s) consistent with the applicable potential municipal zoning and development standards.

4. The forming of unincorporated enclaves shall be avoided in the UGA;

5. The minimum parcel sizes/density of new residential development within the UGA that proposes to utilize on-site sewage treatment systems shall be jointly and collaboratively established by the County and the municipalities in an adopted Interlocal Agreement.

6. Interlocal agreements shall be cooperatively developed by the County and the municipalities to address the following:

   a. Consistent with Policy 5.10 below, establish and implement Urban Growth Area policies and include zoning district boundaries, uses, density and such standards as may be required to coordinate development decisions within the unincorporated portion of the UGA. These agreements shall be adopted within 90 days of the CWPP amendments. In the case where future amendments to Urban Growth Area boundaries trigger the need for an interlocal agreement or revision of an existing agreement, the agreement/revised agreement shall be adopted at the same time as the amended UGA boundary.

   b. Establish and implement the Joint Planning Area policies to include UGA Expansion Areas with appropriate regulations and procedures. These agreements shall be adopted within 90 days of the adoption of the CWPP amendments.

7. Except as authorized by the Growth Management Act, urban development shall not be permitted outside of the boundaries of UGAs. Once established by the County pursuant to RCW 36.70A.070(5), expansion of the boundaries of areas of more intensive rural development shall only be permitted pursuant to RCW 36.70A.070(5) and otherwise shall not be permitted to expand unless they are designated as Urban Growth Areas in compliance with the requirements of RCW 36.70A.110.

8. The intensification of development on lots containing isolated non-residential uses or new development of isolated cottage industries and isolated small-scale businesses permitted by RCW 36.70A.070(5) are permissible, subject to adopted development and compatibility standards.

9. As permitted by RCW 36.70A.070(5), the intensification of development of or new development of small-scale recreation or tourist uses are permissible including commercial facilities to serve those recreational or tourist uses, that rely on a rural location and setting, but do not include any residential development, all subject to adopted development and compatibility standards.

10. The preference for urban development is as stated in Policy 5.1 above, that urban development is to occur in a municipality or be annexed to a municipality. In those cases where development is within the unincorporated portion of a municipal UGA and is not served by municipal services, the development shall use rural governmental services and comply with the County's rural development standards or, for development within the unincorporated portion of Langley's and Coupeville's UGAs, such service requirements and

development standards established through adopted interlocal agreements between the County and the City of Langley and the Town of Coupeville.

Amendment to Policy 5.10 adopted on 2/22/99.

POLICY #6

POLICIES FOR COUNTY-WIDE TRANSPORTATION FACILITIES & STRATEGIES

It is the policy of the County and the Municipalities that:

1. The Transportation element of the Island County Comprehensive Plan should include Urban Growth Area elements to assure consistency among planning jurisdictions. All transportation planning, including that of Federal and State Agencies as well as Port Districts, should be jointly and cooperatively developed, adopted and implemented through coordinated planning;
2. The County and Municipalities will remain actively involved in multi-county regional transportation planning;
3. The County and Municipalities will cooperate in the analysis of and response to any major regional industrial, retail/ commercial, recreation or residential development proposals that may impact the transportation systems in Island County;
4. The capacity of the roadway system must be planned, built and managed to meet planned land use densities in UGAs, and the development of transportation modes offering alternatives, such as transit and telecommunications, to the automobile should be encouraged.
5. The planned transportation system should be implemented in a coordinated and cost-effective manner utilizing a fair and sufficient method of funding.
6. All jurisdictions within Island County will cooperate with each other and the State of Washington in coordinated planning for State Highway and Ferry facilities with respect to current revisions to RCW 36.70A as amended by SHB 1487. This coordination recognizes that the State Department of Transportation will be primarily responsible for establishment and maintenance of the level of service for these facilities.

Note: Policy # 6 amended by Resolution C-169-98 on December 28, 1998 by the addition of paragraph #6.

POLICY #7

POLICIES ON AFFORDABLE HOUSING, FOR ALL OF THE POPULATION

It is the policy of the County and Municipalities that:

1. A wide range of housing development types and densities throughout the County should be encouraged and promoted to meet the needs of a diverse population and provide affordable housing choices for all;

2. Manufactured home parks at Urban densities, should be located within Urban Growth Areas.

3. Multifamily housing, at urban densities, should be located within UGAs and/or unincorporated Rural Centers;

4. The County and Municipalities should provide appropriately zoned lands and/or location criteria to assure the inclusion of multi-family housing and manufactured home parks within Urban Growth Areas and should provide for other types of housing for individuals with special needs throughout the county;

5. The comprehensive Plans of the County and Municipalities should consider housing and housing provision options such as:

    a. Development of boarding houses, single-room occupancy housing, scattered site housing, and accessory housing such as elder cottages, guest houses and/or attached apartments;

    b. Establishment of a public/private housing trust fund to provide loans and grants for development of low to moderate-income housing and housing for persons with special needs;

    c. Identification of publicly-owned properties, excluding those designated as Resource or Critical Lands, that could serve as possible sites for development of affordable low income or senior housing; and

    d. Identification of regulatory relief actions such as inclusionary zoning, density bonuses for the development of lower-cost housing or in-lieu-of payments into a housing trust fund, forgiveness of impact or mitigation fees for low-income housing as authorized under the Growth Management Act or priority permit process treatment of housing developments intended for or including affordable housing.

6. It is intended that provisions for affordable housing will be required elements of the economic development and comprehensive plans of the County and the Municipalities.

POLICY #8

POLICIES FOR PARKS, RECREATION OPEN SPACE AND NATURAL LANDS

To protect the rural and scenic character of Island County and to ensure that both urban and rural residents of the County have reasonable access to and opportunities for outdoor recreation, it is the policy of the county and the Municipalities that:

1. Each jurisdiction intends to include a park, recreation and open space element in its GMA Comprehensive Plan. These elements shall be coordinated and, where appropriate, the County and each of the cities should adopt level of service standards and definitions. Capital facility plans for funding and acquisition of new parks and recreation facilities should also be coordinated between the county and each of the cities to ensure efficient and effective use of public funds.
2. Establish a county-wide system of non-motorized trails. Trails would be established on a region wide basis.
3. Identify, establish and protect open space corridors and greenbelts within and between urban growth areas through (a) public acquisition of fee or lesser interests in these corridors by purchase donations, incentives such as density bonuses; and (b) by use of the open space tax program.
4. Develop and adopt a County-wide plan for the preservation and acquisition of lands for open space, recreation, and natural resources (Natural Lands Plan) that can serve as an "implementation umbrella" for municipal plans with open space components. The Plan should prioritize voluntary acquisition of sites based upon their conservation, open space, or recreation value. The Plan should coordinate implementation programs to acquire and protect these identified sites. The plan should implement County Comprehensive Plan policies regarding protection of the rural character and livability of Island County by protecting open space corridors, areas that are important to separate and define urban growth areas, and areas of more intensive rural development.
5. To preserve open space and create recreational opportunities by innovative incentives and/or regulatory techniques such as, but not limited to, purchase of developments rights, conservation easements, land trusts and community acquisition of lands for public ownership shall be encouraged.
6. The use of open space taxation laws shall be evaluated as a useful method of land use control and resource preservation.

7. Maintaining recreation and open space corridors shall be coordinated with land use elements.
8. A park and recreation system shall be promoted which is integrated with existing and planned land use patterns.
9. School districts, local public agencies, State and Federal governments, recreation districts, the Federal government, and private entities should work together to develop joint inter-agency agreements to provide facilities that not only meet the demands of the education for youth, but also provide for public recreation opportunities that reduce the unnecessary duplication of facilities within Island County.
10. Review, comment and coordinate with Navy plans such as the NAS Whidbey Island Base Master Plan, Natural Resources Management Plan, Outdoor Recreation Management Plan, etc. as Appropriate, and continue to maintain active communication.

Note: This policy #8 was adopted as an amendment to the County-wide Planning Policies by the Board of Island County Commissioners and the Municipalities on July 27, 1998

POLICY #9

POLICIES FOR PROJECTING POPULATION GROWTH AND EMPLOYMENT

It is the policy of the County and Municipalities that:

1. Initial Growth Projection: Initial population and employment growth projections will be established as follows:

   a) The County has elected to use the 1995 Office of Financial Management 2020 High Series Population Growth for the County Comprehensive Plan. The Municipalities do not necessarily concur with this policy. The Municipalities previously elected to prepare their Comprehensive Plans for planning periods ending in 2010 or 2013 utilizing the earlier OFM single series projection which is now considered to be the Medium Series.

   b) The County has prepared population projections for each Municipality for the planning period projected to the year 2020 using a rate of growth assumed by the municipality in its comprehensive plan. The Municipality will accept the County projections and allocations for the purposes of planning the unincorporated portion of the urban growth area with the understanding that the projections and allocations will be reconciled on the basis of long-term monitoring as provided for below and in Policy #3. The initial population growth projections are set forth in Attachment A.

   c) The Island County EDC Jobs Forecast dated March 26, 1998 will be used to project employment growth. The initial employment growth projections are set forth in Attachment A.

2. Long-term Monitoring. Though not required by the GMA, the County in collaboration with each Municipality will implement a monitoring and evaluation program modeled after the process set forth in RCW 36.70A.215 and Policy #3, Item 5 above. The long-term monitoring program shall commence as soon as results of the U.S. Year 2000 Census and updated OFM projections have been released, and shall be repeated in 2006, 2011 and 2016. The Municipal and County Comprehensive Plans will be collaboratively synchronized and reconciled by 2006.Revised UGA boundaries shall be based on such factors as the ability to provide urban services.

3. General Objectives

   Consistent with Policy #3, Item 5 above, the following are examples of general objectives that shall be considered in the establishment of specific benchmarks:

   b. Population Distribution:

- Increase the percentage of total county population growth occurring inside the urban growth areas, including potential non-municipal Urban Growth Areas in Freeland and Clinton.
- Decrease the percentage of total county population growth occurring in the rural areas.
- Encourage, to the extent permitted by the GMA, as much rural growth as possible as infill within the logical outer boundaries of existing, designated Areas of More Intensive Rural Development.

c. Employment:

- Increase non-military, locally-based jobs from the current 40% of the County labor force to 50% of the labor force by the year 2020, an increase of approximately by 4,000 local jobs above the current level of non-military, locally-based jobs.

ATTACHMENT A

Population	1996	2020	24-year Growth	% of Growth	Change from median forecast
North Whidbey	39,100	57,500	18,400	42%	+2,500
Oak Harbor UGA	19,200	31,000	11,800		
Unincorporated	19,900	26,500	6,600		
Central Whidbey	10,200	14,000	3,800	9%	
Coupeville UGA	1,600	2,000	400		
Unincorporated	8,600	12,000	3,400		
South Whidbey	13,600	26,000	12,400	28%	+4,850
Langley UGA	1,000	2,200	1,200		
Freeland RAID	1,400	2,500	1,100		
Clinton RAID	900	2,000	1,100		
Unincorporated	12,600	23,800	11,200		
Camano Island	12,000	21,300	9,300	21%	+4,850
Island County	74,900	118,800	43,900		+12,200
UGA	21,800	35,200	13,400	30%	
Rural	53,100	83,600	0,500	70%	

Employment	1996	2020	22-year Growth	% of Growth
North Whidbey	16,143	22,850	6,707	57%
Oak Harbor UGA	5,516	11,400	5,884	50%
Unincorporated	10,627	11,450	823	7%
Central Whidbey	2,287	3,551	1,264	11%
Coupeville UGA	1,537	2,378	841	7%
Unincorporated	750	1,173	423	4%
South Whidbey	2,708	5,634	2,926	25%
Langley UGA	509	1,310	801	7%
Unincorporated	2,199	4,324	2,125	18%
Camano Island	451	1,310	859	7%
Island County	21,585	33,345	11,760	
UGA	8,138	15,233	7,095	64%
Rural	13,902	18,112	4,210	36%

EXHIBIT B

Scenic Corridor Overlay Zone Standards &
City of Langley Comprehensive Plan Map

COPY

CITY OF LANGLEY

ORDINANCE NO. 732

AN ORDINANCE amending Ordinance 685, the City of Langley Comprehensive Plan and the Comprehensive Plan Map as adopted November 16, 1994.

WHEREAS, the Langley City Council believes that Langley will benefit from the adoption of amendments to the City Comprehensive Plan and Map to manage growth; and

WHEREAS, the Washington State Growth Managment Act authorizes municipalities to amend their Comprehensive Plan that addresses the growth management goals set forth in the Act no sooner than once per year; and

WHEREAS, the amendment process involved extensive citizen involvement in development and review of the proposed amendments through the auspices of the City Planning Advisory Board; public meetings and public hearing by the Board, distribution of information on draft planning amendments,

THE CITY COUNCIL OF THE CITY OF LANGLEY, WASHINGTON, DO HEREBY ORDAIN as follows:

Section 1. The Langley City Council finds that the amendments to the Langley Comprehensive Plan and Map will protect and promote the health, safety and welfare of the general public, and are not intended to recognize or establish any particular person or class or group of persons who will or should be especially protected or benefitted by the Plan.

Section 2. The amendments to the City of Langley Comprehensive Plan and Map adopted November, 1994, which are adopted by the enactment of this ordinance are contained in Exhibit 'A' and Exhibit 'B', attached hereto and incorporated into this ordinance by this reference. The amendments are adopted pursuant to the authority granted by RCW 36.70A (Growth Management Act).

Section 3. This ordinance shall not be construed as affecting any existing right or obligation pursuant to laws in effect before the effective date of this ordinance.

EXHIBIT A

SCENIC CORRIDOR
STREETSCAPE ELEMENT

INTENT:

The purpose of the Scenic Corridor Streetscape Element is to establish the general design guidelines for the aesthetic improvements of the main entrance roadways to the City. The streetscape policies are intended to result in development that provides a visual buffer between development and the street, create a comfortable street space for vehicles and pedestrians, maintain continuity of the City's unique natural design concepts, and preserve existing natural vegetation.

The roadways that the Scenic Corridor streetscape policies relate to include; Brooks-Hill Road, Coles Road, Saratoga Road, Maxwelton Road, Langley Road and Sandy Point Road (those segments shown on the City's Comprehensive Plan Map).

STREETSCAPE ISSUES:

As the City of Langley and the region as a whole continue to develop, existing roads may have to be upgraded to more safely carry more traffic, providing the opportunity to maintain and/or improve the design and appearance of such roads. The preservation and/or addition of tastefully designed landscaping, screening and buffers adds to the appearance of the roads as well as protecting adjacent uses from roadway noises and preserving rural character.

Impervious surfaces, such as roadways, contribute to the amount of stormwater runoff that flows into area streams. This can be minimized by planting landscaping along roadways that slows the flow of the water and allows it the opportunity to filter into the soil rather than to run off onto paved surfaces.

STREETSCAPE POLICY:

Existing significant trees and understory vegetation that can be incorporated into the landscape design of designated roadways should be preserved.

BUFFER/CUTTING PRESERVE POLICIES:

A. A minimum buffer/cutting preserve, fifty feet in residential areas and thirty-five feet in non-resedential areas, shall be provided outside of right-of-way on private or public property on each side of all collector and arterial roadways. For lots less than one acre in size, the width of the buffer shall be reduced as necessary to allow reasonable development of the property but under no circumstances shall the buffer be less than twenty feet in width. The purpose of said preserves is to protect existing stands of significant trees and understory vegetation, create a

boulevard effect in the street corridor and separate the pedestrian activity associated with the adjoining uses from the vehicular activity of the street corridor.

Landscape treatment of such buffer/cutting preserves shall include the following forms:

* Native Growth
* The retention and preservation of existing topography and undisturbed natural landscape materials.

* Natural Plantings
The retention of suitable natural landscape materials supplemented with sodded berms and natural plant materials; i.e., non-flowing evergreens, deciduous and natural groundcover species. Minor modification of existing topography may be appropriate to achieve the Natural Plants cutting preserve form.

* Manicured
The removal of the majority of natural landscape materials, new land contouring and re-vegetation with flowering species; i.e., perennials, annuals, rhododendrons, azaleas and groundcover.

B. Any new landscape plantings within the buffer/cutting preserve should be placed in an informal manner to buffer the adjacent development areas and supplement existing native vegetation. Groundcover shall be provided in all shrub planting areas. Whenever possible, native plant species should be used in new plantings.

C. Where there is a significant grade change in the land adjacent to the street, appropriate landscaping and retaining structures may be used as necessary.

EXHIBIT C

Proposed UGA Zoning Regulations

17.03.____ Urban Growth Area - Langley (UGA-L) Zone

The purpose of the Urban Growth Area–Langley Zone UGA-L is to provide for the development of the lands inside the City of Langley's Municipal Urban Growth Area at densities and uses that will provide for the efficient provision of municipal water and sewer services.

A. **Permitted Uses.** Uses permitted outright. Processed as Type I decisions pursuant to Chapter 16.19 ICC:

1. Single family detached dwellings.
2. Accessory Uses and Buildings on Lots with legally Permitted Uses;
3. Bed and Breakfast Room;
4. In-home Family Day Care Nursery;
5. Foster homes;
6. Adult Family Home
7. Home Occupation occupying no more than 25% of the Gross Floor Area or a maximum of 600 square feet in a detached single family dwelling unit;
8. Guest Cottage or Accessory Dwelling Unit subject to Site Coverage requirements of ICC 17.03.180.P;
9. Minor utilities;
10. Temporary Uses.

B. **Conditional Uses.**

Uses allowed upon Site Plan approval pursuant to Chapter 16.15 ICC processed as Type II decisions pursuant to Chapter 16.19 ICC:

1. Bed and Breakfast Inn with not more than six (6) guest rooms;
2. Fire Station; and
3. Water Tanks.

Uses allowed upon Site Plan approval pursuant to Chapter 16.15 ICC processed as Type III decisions pursuant to Chapter 16.19 ICC

1. Group home;
2. Social service facilities;
3. Libraries and museums;
4. Nursing Homes;
5. Day Care Centers;
6. Senior Retirement Facility;
7. Cottage Housing;
8. Clustered residential developments;
9. Churches; and
10. Private or public schools.

C. **Prohibited Uses**

1. Helipads.

D. **Designation Criteria and Areas.**

1. Areas within the designated boundaries of the Langley Municipal Urban Growth Area.

E. **Lot/Density.** Lot/Density requirements shall be as follows:

1. Base Density, shall be 1 d.u. per 5 acres.
2. A Density ~~bonus of up to 200% of base density~~ **three dwelling units per five acres** is allowed provided that the public sewer, water and stormwater facilities conforming to City of Langley Utility plans and design standards are installed **or, installation is secured by a bond or other form of approved security** along the frontage of the portion of the property to be developed under this provision.
3. For Land Divisions approved after the execution of the Langley Interlocal Agreement, lot sizes for single family detached dwellings shall be established pursuant to the Potential Municipal Zoning Classification except in no event shall lot size exceed 15,000 square feet and lot clustering shall be required when necessary to carry out this provision.

F. **Setbacks and Lot Dimensions.** Setback requirements shall be as follows:

1. Street or front yard : twenty feet;

2. Side yard: five feet on each side;

3. Rear yard: twenty-five feet.

G. **Maximum Height.** Maximum height shall be thirty feet. The maximum height for accessory structures shall be twenty feet.

Exhibit D

Model Annexation/Development Agreement

THIS AGREEMENT, made and entered into this _____ day of _____, _____, by and between the CITY OF Langley, a noncharter code city, organized and existing under the laws of the State of Washington (hereinafter referred to as the "City"), and _____ (hereinafter referred to as the "Owner").

WITNESSETH:

WHEREAS, the City has established and Island County has adopted an Urban Growth Area (UGA) and Joint Planning Area (JPA) that includes properties in unincorporated Island County;

WHEREAS, the City and Island County have entered into an Interlocal Agreement (Exhibit A) setting forth certain requirements for development proposed in the unincorporated portion of the City's UGA and JPA, including the requirements for an Annexation/Development agreement for developments in those areas of the UGA and JPA that are not contiguous to the municipal boundaries of the City;

WHEREAS, the Owner owns that certain real property situated in unincorporated Island County, Washington (hereinafter referred to as the "Property"), which is more particularly described as follows:

WHEREAS, the parties desire to enter into the development agreement set forth herein;

NOW, THEREFORE, in consideration of the covenants and agreements herein contained, and mutual benefits, the receipt and adequacy of which are hereby acknowledged, the parties hereby covenant and agree as follows:

1. Annexation. As a condition of approval of land use and/or building permits for the Property by the County pursuant to this Agreement, the Owner, for itself and for all successors in interest, hereby covenants and agrees to: (1) whenever so requested, sign any letter, notice, petition or other instrument initiating, furthering or accomplishing the annexation of the Property to the City; (2) the owner and the owner's successors in interest shall not file or make formal protest of such annexation;(3) actively promote annexation, whether or not the annexation involves the assumption by the area to be annexed of existing City indebtedness (to be assessed and taxed at the same rate and on the same basis as properties in the City are assessed and taxed to pay for all or any portion of the then-outstanding indebtedness of the City).
2. Pre-Annexation Zones. The subject property has been potentially classified by the County to allow urban development in the _____ zone, based on the City's adopted Comprehensive Plan. Upon annexation the City hereby commits to

classify the property in this zone classification and to not reduce the density or intensity of permitted uses, subject to the limitations set forth herein.

3. Site Development Plan. The owner has prepared and the City has approved the Site Development Plan attached hereto as Exhibit B. This Plan depicts the ultimate development of the Property, consistent with the _____ zone and applicable City Development Regulations. Upon annexation, the City hereby commits to permit development of the Property consistent with this Site Development Plan, subject to the limitations set forth herein.

4. Limited Power of Attorney. The Owner, for itself and all successors in interest to the Property, or any portion thereof, does hereby make, constitute and appoint the City of Langley as its true and lawful attorney-in-fact for it, and in its name, place and stead, to execute, sign, seal, acknowledge and deliver any and all letters, notices, petitions, annexation agreements or other documents which may be necessary to start or complete an annexation of the Property to the City of Langley, Provided that (a) the Owner received notice before any action by the City utilizing the authority granted by this subsection, (b) the Property is not burdened by more than its proportionate share of City indebtedness, and (c) that the City's Comprehensive Plan, zoning, and other land use controls continue to permit urban development of the Property. All rights, power, and authority of said attorney-in-fact to exercise any and all of the rights and powers herein granted shall commence and be in full force and effect on the effective date of this Agreement. This limited power of attorney may not be revoked during the term of this

Agreement. This limited power of attorney shall be automatically terminated by the termination of this Agreement.

5. Development of Property to be in Accordance with applicable Development Regulations and Standards. All platting, construction work, and other development of the Property, or any portion thereof, shall conform to the following: (a) If the property is eligible for annexation to the City, annexation is a condition of development approval and development shall be consistent with the City's development regulations and standards, or (b) If the Property is not eligible for annexation to the City, development shall be consistent with the development regulations and standards set forth in the City of Langley/Island County Interlocal Agreement.

6. Modifications to Regulations. The uses and densities established in the City's zoning code for the zone districts consistent with the City's land use designations for the Owner's Property and the Site Development Plan attached to this agreement shall be in effect for a period of five (5) years from the effective date of this Agreement. Subsequently, any revisions to zoning or other Development Regulations may be applied to the Property but only if the City regulations continue to permit urban development and on the basis that such revisions apply to all properties similarly situated and zoned. Provided that, changes in regulations may not be applied if the Owner has made substantial progress in implementing the Site Development Plan and/or a phasing plan has been approved by the City.

7. Site Plan Revisions. The Site Development Plan attached hereto as Exhibit B may be revised as follows:

   A. If at the time of a proposed revision, the Property is eligible for annexation to the City, the City shall approve the revisions to the Site Development Plan.

   B. If at the time of a proposed revision, the Property is not eligible for annexation, the City and Island County shall mutually agree to a revision to the Site Development Plan. Minor revisions may be approved by the County Planning Director and the City Planning Official. Major revisions shall be approved by the appropriate approving authority based on a joint recommendation from the two planning officials. A revised site plan shall be recorded and become an exhibit to this Agreement.

8. Priority of Agreement. The Owner agrees that the Property shall be subject to the provisions of this Agreement, and that the provisions of this Agreement shall not be subordinate to any lien, mortgage or any other interest in the Property.

9. Binding Effect. This Agreement shall bind and inure to the benefit of the respective heirs, personal representatives, successors and assigns of the parties hereto. In each deed, contract, or other instrument by which the Owner conveys any portion of the Property, this Agreement shall be incorporated by reference, and identified by the Auditor's File Number under which this Agreement is recorded in the records of the Island County Auditor.

10. Liability for Breach of Agreement. This Agreement shall bind the City and the Owner and any successor in interest to the Owner to any portion of the Property, and all such persons who are in breach of this Agreement shall be jointly liable for such breach. Provided, However, that if any conveyance of the Property, or any portion thereof, requires that the grantee, as a condition of such conveyance, agree to be personally bound by all obligations and duties of the Owner arising under this Agreement with respect to that portion of the Property so conveyed, and such grantee agrees thereto in writing, then, upon the recording of such conveyance and agreement, the Owner (or subsequent owner) shall automatically be released from any further personal liability relating to such portion of the Property.

11. Specific Performance. The parties hereto agree that it may be impossible to measure in money the damages which will accrue to a party hereto by reason of a failure to perform any of the obligations under this Agreement. Therefore, if either party hereto shall institute any action or proceeding to enforce the provisions hereof, any party against whom such action or proceeding is brought hereby waives the claim or defense therein that such party has an adequate remedy at law. Provided, However, that this Paragraph 11 shall be in addition to, and not a limitation of, any rights or remedies of such party hereunder. The substantially prevailing party in any enforcement action shall also be entitled to reasonable attorneys fees and expenses.

12. Benefits and Burdens to Run with the Land. All of the provisions of this Agreement, including the benefits and burdens thereof, shall attach to and run with the land, as they affect the Property, and shall be binding upon all persons and

other parties having or any portion thereof, and shall inure to the benefit of each present and future owner thereof. After this Agreement has been executed by the parties, it shall be recorded in the records of the Island County Auditor.

13. Entire Agreement. This Agreement contains the entire agreement of the parties with respect to the transactions hereinabove set forth, and this Agreement may not be amended, modified, released or discharged, in whole or in part, except by an instrument in writing signed by all of the parties hereto.

14. Authority. This agreement is executed under the authority and procedures of RCW 36.70B.170.The City and Owner each represent and warrant it has the respective power and authority, and is duly authorized, to execute, deliver, and perform its obligations under this Agreement.

15. Dispute Resolution. If the parties to this agreement cannot agree on a resolution to provisions of this agreement, the parties shall mutually select a third party mediator to assist the parties in resolving the dispute. Litigation may be commenced only after the parties have attempted to resolve the dispute through mediation.

16. Indemnification. Except as otherwise specifically provided elsewhere in this Agreement and any exhibits hereto, each party shall protect, defend indemnify and hold harmless the other party and their officers, agents, and employees, or any of them, from and against any and all claims, actions, suits liability, loss costs, expenses, and damages of any nature whatsoever, which are caused by or result

from any negligent act or omission of the party's own officers, agents, and employees in performing services pursuant to this agreement. In the event that any suit based upon such a claim, action, loss, or damage is brought against a party, the party whose negligent action or omissions gave rise to the claim shall defend the other party at the indemnifying party's sole cost and expense; and if final judgment be rendered against the other party and its officers, agents, and employees or jointly the parties and their respective officers, agents, and employees, the parties whose actions or omissions gave rise to the claim shall satisfy the same; provided that, in the event of concurrent negligence, each party shall indemnify and hold the other parties harmless only to the extent of that party's negligence. The indemnification to the City hereunder shall be for the benefit of the City as an entity, and not for members of the general public.

17. Effective Date and Term. The effective date of this Agreement shall be the day and year first written above. This Agreement shall continue until the earlier to occur of the annexation of all of the Property into the City, or the termination of this Agreement under its own terms or applicable law.

IN WITNESS WHEREOF, the parties have executed this Agreement in duplicate.

CITY OF LANGLEY OWNER: _____

Appendix E

I&I Analysis

Appendix E
Inflow and Infiltration Analysis

The purpose of this memorandum is to discuss and provide results of the infiltration and inflow analysis performed with data for 2012 and 2013.

Inflow and Infiltration into a system can be identified in different ways. Correlation between rainfall, water use, and flow data is a critical element in determining the magnitude of the problem. This analysis shows the analysis by comparing the rainfall, water and flow data for the years 2012 and 2013. Inspections and observations are not included in this analysis.

E.1 DATA COLLECTION

E.1.1 Water Consumption for Sewer Accounts

The city of Langley meters water consumption for each water account and categorizes them by commercial or residential. The data is further categorized by whether the city provides sewer service to the connection. The meters are read every other month, so monthly data is averaged between the two months.

E.1.2 Rainfall

Rainfall data was collected at Paine Field which is approximately 10 miles southeast of the city. Rainfall data collected represents daily rainfall for the years 2007 through 2014 and is measured in inches of precipitation.

E.1.3 Wastewater Flow Data

Wastewater flow data can be collected through the wastewater treatment plant meter, or through the pump run times. For this analysis, it was determined that pump run times would be the most applicable for estimating I&I because it would be the most accurate in portraying the collection system flows. During the period of this analysis the wastewater treatment plant was accepting septage which doesn't represent the collection system flows.

The system has three pump stations, the Marina Pump Station, and Pump Stations Nos. 1 & 2. All flows go through Pump Station No. 2 before entering the treatment plant, so therefore, flows only from Pump Station No. 2 was used for the analysis.

E.2 ANALYSIS

The city experiences higher population and visitors during the summer months which increases sewage flows in the summer. This make the difference between the summer and winter sewage flows vary insignificantly. Typically with Inflow and Infiltration during the winter months, significantly more flows in the collection system are encountered.

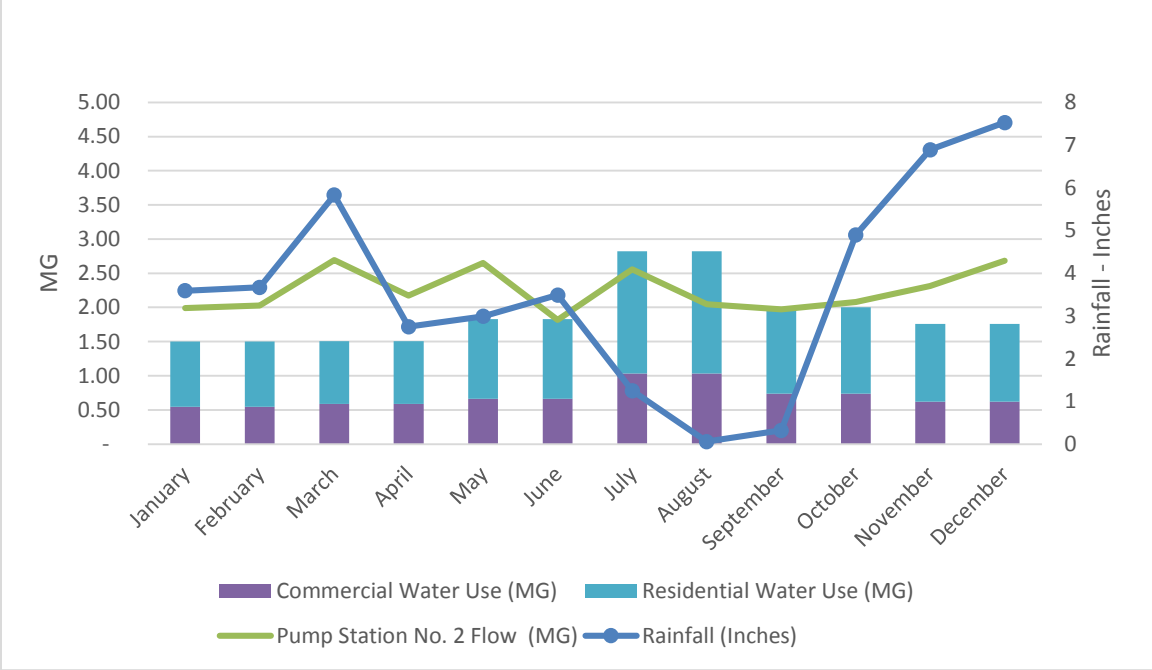
Inflow and infiltration was estimated by subtracting the monthly estimated sewer base flow (determined from customer water use trends) in the winter months from the total flows for each month. If water use was greater than the total pumped flow, then that month is not used.

Efforts were taken to translate these volumetric values into a typical I&I value of gallons per acre per day but the values didn't represent the system well. The total area of land contributing to the infiltration entering the system is unknown and hard to predict, and therefore make a more volumetric approach easier to measure.

E.2.1 2012 Analysis Results

The 2012 data, graphed in Figure E-1, shows that March was a month of heavy rainfall with consistent levels of water use and the pump station flow increased during this month which indicates sewage flows increased due to I&I.

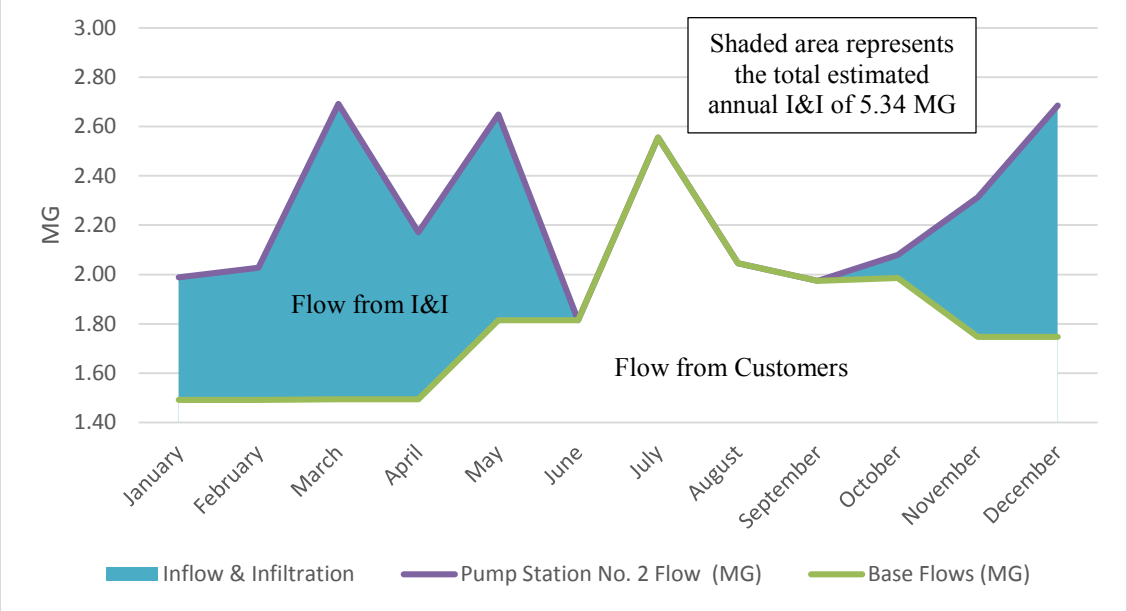
Figure E-1: 2012 Data Graph



E.2.2 2012 Total I&I Estimates

For the year of 2013, it is estimated that of the total annual flow of 27.00 MG entering the treatment plant, 5.34 MG can be attributed to I&I, shown in Figure E-2. This is approximately 20% of the flow.

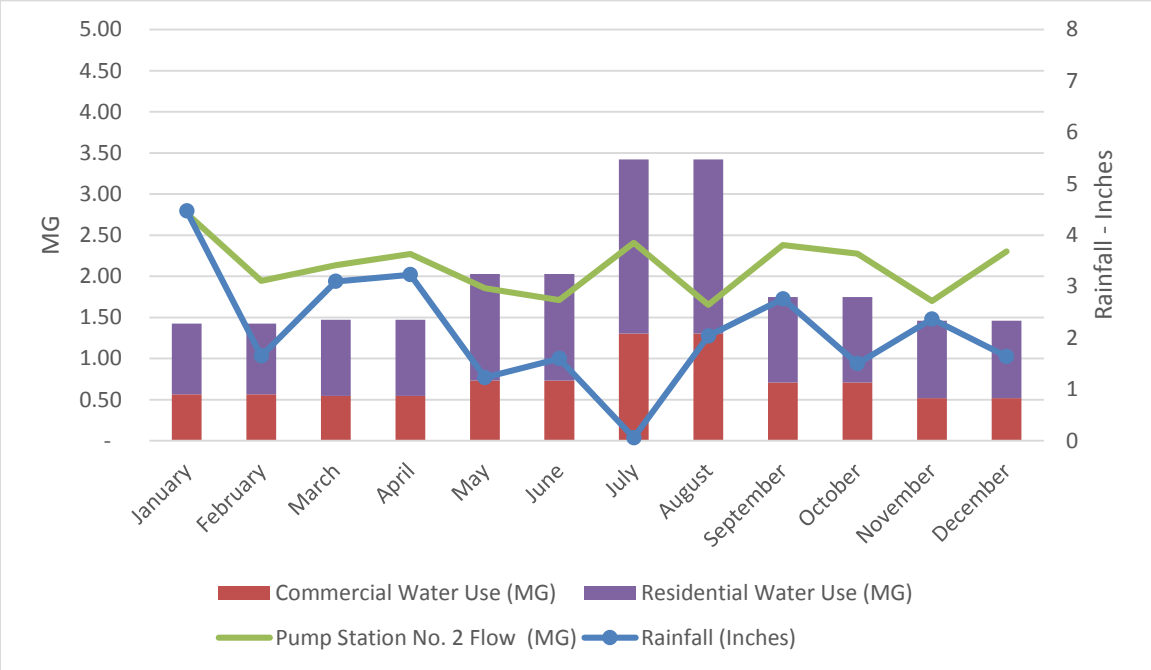
Figure E-2: 2012 I&I Totals



E.2.3 2013 Analysis Results

The 2013 data shows that sewage collection flows roughly follow the trends of the rainfall except for the summer months of July and August and an exception for the month of December. It is assumed that the increase in flows for the month of December can be attributed to higher water use from additional visitors but since November and December water use is averaged (due to bimonthly meter reading), it doesn't reflect that on the graph.

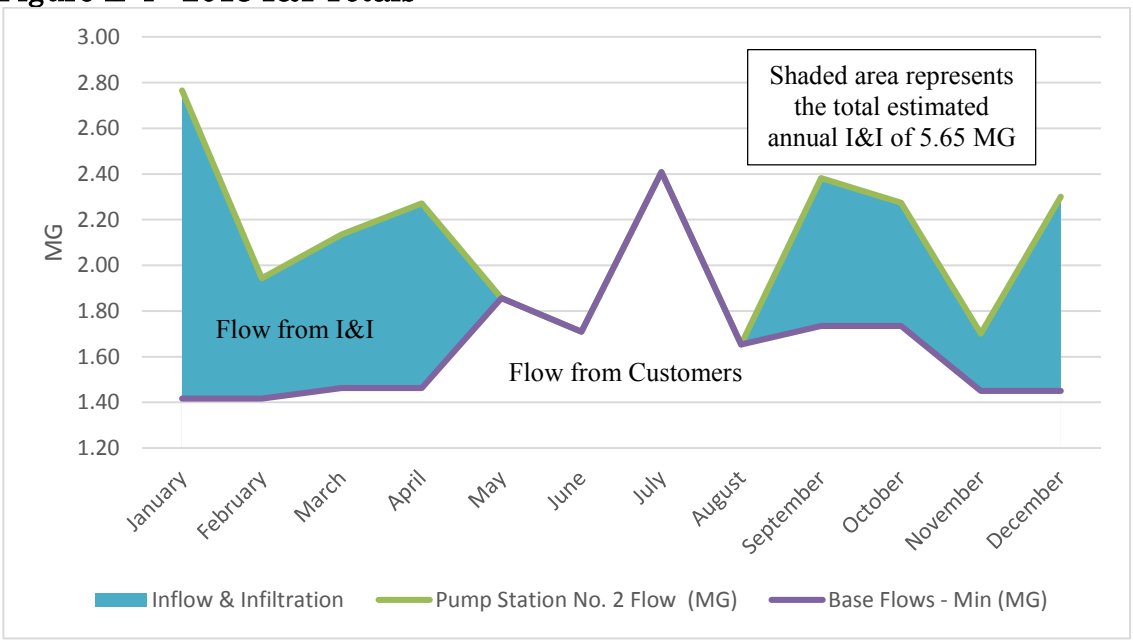
Figure E-3: 2013 Data Graph



E.2.4 2013 I&I Estimates

For the year of 2013, it is estimated that of the total annual flow of 25.40 MG entering the treatment plant, 5.65 MG is I&I, which is approximately 22% of the flow. This is shown on Figure E-4.

Figure E-4: 2013 I&I Totals



Appendix F

Pipeline Rehabilitation and Renewals

Appendix F
Pipeline Replacement and Rehabilitation

Due to growth, facility capacities and costs, the City has a responsibility to operate the sewer system as efficiently as possible. Part of responsible operation, maintenance and system management includes controlling infiltration and inflow into the system. Infiltration is defined as ground water which enters the sewer system through pipe joints, cracked or leaking pipes, porous pipes or similar openings in the system. Infiltration can enter the system through the main line, side sewers and manholes. Inflow is surface water which enters the sewer system through manhole covers, cross connections with storm drainage systems or illegal connections to the sewer system such as yard drains, footing drains, area drains or roof drains.

Excessive infiltration and inflow can lead to capacity issues in sewer mains, pump stations and/or treatment facilities and can result in sewer overflows, basement backups, or surcharged manholes. If infiltration and inflow are allowed to persist over a period of time, other problems can eventually occur such as increased deterioration of the pipe bedding or backfill which could create or contribute to sewer system failure and/or damage to surrounding utilities. This, in turn, necessitates system upgrades at a more rapid pace than would otherwise be expected. All of these issues eventually result in increased system costs. Either of these options increase costs to the rate payers. The challenge to sewer service providers is to determine the cost effective amount of I&I to be removed.

An important step in controlling infiltration and inflow is identifying the most problematic areas and determining the cause of the infiltration and/or inflow. Once the causes of the excessive flows are identified, appropriate replacement or rehabilitation means can be considered and specific project recommendations can be developed.

F.1 INFILTRATION

Infiltration into a system can be identified in different ways. Preliminary steps in identifying infiltration include flow monitoring and system inspection. Flow monitoring should be accomplished systematically to identify larger problem areas first and by moving monitors upstream to narrow the suspect areas. Correlation between rainfall and flow data is a critical element in narrowing the magnitude and cause of infiltration, as egregious leaks into the system will be identified by the time lapse between rainfall and increased flows.

It is therefore recommended that during rain events, flow data be recorded by inspection as frequently as practical and if possible that monitors be placed throughout the system.

Once suspect areas have been identified, video inspection, coupled with compilation of pipeline data (as discussed below), is the logical step in a more specific I&I analysis. Video inspection of both main line and side sewer pipes is recommended to determine the magnitude and nature of the problems. Causes of infiltration, such as root intrusion and major pipe cracks, can be identified under normal inspection conditions. Other sources of infiltration, such as cracks and leaking joints, can be more readily identified during wet weather inspections.

F.1.1 Replacement and Rehabilitation Matrix

Once the pipe lines with significant infiltration are identified, pipeline replacement and/or rehabilitation projects can be established. A matrix, provided at the end of this appendix section, was developed from routine inspection and maintenance and is used as a tool to assess the relative priority of sewer line replacements and/or rehabilitations. The matrix uses known sewer system observed deficiencies such as broken pipes, sagging, protruding lateral, protruding roots, debris or blockage and observed infiltration to assist in prioritizing future projects. The pipe is assigned a point value to reflect the severity of the deficiencies. The points are then totaled to give each pipe a total score based on relative importance. The pipe length with the highest score should have the highest priority for replacement or rehabilitation, however, the City reviews and modifies the rankings depending on information known to them.

F.1.1.1 Matrix Criteria and Values

The priority matrix will be developed to consider important factors in sewer replacement and/or rehabilitation projects. The basic factors considered are pipe age, pipe material, observed deficiencies, Similarly, the pipe type provides a good indication of the need for replacement or rehabilitation.

At this time, it is unknown the pipe age and type of all the pipes in the system. Further time and effort will need to be taken to consider these factors.

The observed deficiencies were assigned a point value. Structural deficiencies were given three points, which were broken pipes and sagging. Observed infiltration and protruding laterals were given two points, while protruding roots and debris or blockage was given one. All pipes that scored more than four points were included in table 6-1 as a capital project to be either rehabbed or replaced, while anything less than 4 points is not considered a capital project and could be addressed through routine maintenance.

F.1.1.2 Matrix Evaluation

Once the matrix has been completed (for a specific area or the entire City), conclusions can be drawn based on the results. The pipelines should be prioritized for replacement or rehabilitation from highest to lowest matrix score. In finalizing replacement or rehabilitation projects, consideration should be given to pipeline locations. For example, the City may decide to have a replacement project for a general area, even though not all the pipes in the area have the highest priority ranking.

F.2 INFLOW

In the City's's recent annual budget reviews, the reduction of infiltration and inflow has been established as a high priority.

It is recommended that the City continue testing to locate and disconnect illegal connections. When additional testing is needed, it is recommended that the City undertake dye testing to accurately locate the connections.

The City has already completed inspection of several sewer mains and compiled a list of recommended replacement and rehabilitation projects. A copy of the current list is included at the end of this

appendix section. This list is continually updated as more inspections and investigations are completed. The City should continue to do this in conjunction with the aforementioned activities.

F.3 RECOMMENDATIONS

The reduction of infiltration and inflow has been established as a high priority.

In order to use the budgeted allowance most effectively, I&I replacement and/or rehabilitation projects need to be established and prioritized. It is recommended that the City use a matrix analysis method to determine pipeline replacement and/or rehabilitation projects and their respective priority. This should help reduce the amount of infiltration into the City's system.

The City has already completed some initial investigation in determining the primary infiltration sources. It is recommended that the City continue investigate and test to locate inflow and infiltration sources. When additional testing is needed, it is recommended that the City undertake dye testing to accurately locate the connections.

The City has already completed inspection of several sewer mains and compiled a list of recommended replacement and rehabilitation projects. A copy of the current list is included at the end of this appendix section. This list is continually updated as more inspections and investigations are completed. The City should continue to do this in conjunction with the aforementioned activities.

Recent trenchless technologies in pipeline rehabilitation has significantly reduced the cost of construction than the traditional excavation and replacement method. Common trenchless construction methods in the include sliplining, pipe bursting, and cured-in-place pipe (CIPP). It is recommended that trenchless technologies be the priority method of rehab work and traditional methods of replacement be only used when cost effective.

Appendix F: Recommended Pipe Improvements

General Sewer Plan Update

City of Langley, WA

From MH	To MH	Street	Nearest Cross Street	Pipe Size	Problem Descprition	Action Required	Quantifiable Ranking	City Priority	CIP Project
E35	E31	Parallel to Brookhaven Creek		10	Protruding & Infiltration at lateral @ 127 feet from E35	Contractor to cut lateral and grout	4	1	RR-1
E43	E43A CO	North of Anderson Road	6th Street	8	Roots @ 214 feet from E43	Contractor to cut roots and sleeve crack	1	2	RR-2
N13	N12	Mcleod Alley (Alley between 2nd Street and 1st Street)	Park Avenue	8	High infiltration @ 15, 28 feet from N13	Investigate rehab or repace	4	3	RR-3
E39	E40	6th Street	Brookhaven Creek	8	Broken pipe @ 30 feet from E39; Protruding lateral @ 31.3 feet	Investigate rehab or repace	4	4	RR-4
W65	W64	Alley between Park Ave & Island View Ln	4th Street	8	Protruding laterals @ 330 & 336 from W64; Infiltration @ 22 feet from W64	Contractor to cut lateral and grout	7	5	RR-5
W70	W69	Anderson Road	6th Street	8	High infiltration @ 227, 228, 249 from W69; Exposed gasket @ 250 feet from W69	Flush and clean, investigate if replacement is warranted	9	6	RR-6
W69	W67	6th Street	Anthes Avenue	8	Sagging @ 162 feet from W67; Concrete in pipe @ 208 feet from W67	Contractor to cut lateral and grout	4	7	RR-7
W71	W70	Anderson Road	Suzanne Court	8		Flush and clean, investigate if replacement is warranted	9	8	RR-8
W75	W72	Suzanne Court	Gleason Lane	8	Sagging @ 18, 58, 69 feet from W75	Flush and clean, investigate if replacement is warranted	9	9	RR-9
W72	W71	Suzanne Court	Gleason Lane	8	Sagging @ 126, 135 feet from W72	Flush and clean, investigate if replacement is warranted	6	10	RR-10
N21	N22	3rd Street	Access Lane North of Anthes Avenue	8	High infiltration @ 16 feet from N21	Investigate rehab or repace	2	11	RR-11
B1	B2	Wharf Street		8	Infiltration @ 63 feet from B1	Investigate rehab or repace	2	12	RR-12
E28	E27	4th Street	Anthes Avenue	10	Protruding lateral @ 155.4 feet from E28; Infiltration @ 4 feet	Investigate rehab or repace	4	13	RR-13
N17	N16	Alley between 2nd Street and 3rd Street	Park Avenue	8	Roots @ 232.0 feet and 269.8 feet from N17	Contractor to cut roots and sleeve crack	2	14	RR-14

From MH	To MH	Street	Nearest Cross Street	Pipe Size	Problem Descprition	Action Required	Quantifiable Ranking	City Priority	CIP Project
N16	N10	Alley between 2nd Street and 3rd Street	Anthes Ave	8	Crack and Roots @ 7' from N16	Contractor to cut roots and sleeve crack	4		-
N21	N9A	Access lane north of Anthes Avenue	3rd Street	10	Sagging @ 102 feet from N21	Flush and clean, investigate if	3		-
W68	W67	6th Street	Anthes Avenue	6	Protruding lateral & concrete slurry @ 92.8 feet from W67	Contractor to cut lateral and grout	3		-
W76	W75	Suzanne Court		8	Sagging @ 26 feet from W75	Flush and clean, investigate if	3		-
W83A	W83	Cottage Lane	4th Street	8	Sagging @ 77 feet from W83	Flush and clean, investigate if	3		-
E38	E39	6th Street	Brookhaven Creek	8	Debris @ 34 feet from E38, Protruding lateral @ 34.2 feet	Investigate rehab or repace	2		-
E43	E40	6th Street	Groom Lane	8	Protruding lateral @ 55.9 feet from E43	Contractor to cut lateral and grout	2		-
E47A	E47	Private Lane	5th Street	6	Protruding lateral @ 9 feet from E47	Contractor to cut lateral and grout	2		-
E58	E57	Lane North of Camano Ave	Edgecliff Drive	8	Protruding lateral @ 235 feet from E57	Contractor to cut lateral and grout	2		-
N18	N17	Alley between 2nd Street and 3rd Street	De Bruyan Avenue	8		Contractor to cut lateral and grout	2		-
N20	N16	Melsen Alley	3rd Street	8	High Infiltration @ 14 feet from N20	Investigate rehab or repace	2		-
E36	E35	Parallel to Brookhaven Creek		10	Protruding lateral @ 89.0 feet from E36	Contractor to cut lateral and grout	1		-
N11	N7	Mcleod Alley (Alley between 2nd Street and 1st Street)		8	Roots @ 104 feet from N7	Contractor to cut roots and sleeve crack	1		-
N12	N11	Mcleod Alley (Alley between 2nd Street and 1st Street)	De Bruyan Avenue	8	Roots along pipe run, location to be verified	Contractor to cut roots and sleeve crack	1		-
N15	N14	Mcleod Alley (Alley between 2nd Street and 1st Street)	De Bruyan Avenue	8	Roots @ 86.0 feet from N14	Contractor to cut roots and sleeve crack	1		-
N19	N18	Alley between 2nd Street and 3rd Street	De Bruyan Avenue	8	Roots @ 269.8 feet from N19	Contractor to cut roots and sleeve crack	1		-
N9A	N9	Access lane north of Anthes Avenue	2nd Street	10	Roots @ 65 feet from N9A	Contractor to cut roots and sleeve crack	1		-
S2	S1	Sunrise Lane	2nd Street	8	Roots @ 227 feet from S2	Contractor to cut roots and sleeve crack	1		-
W63	W62	4th St	Anthes Ave	8	Roots @ 14 feet from W63	Contractor to cut roots and sleeve crack	1		-
W70A	W70	Louisa Street	Al Anderson Avenue	6	Restrictions in pipe @ 72 feet from W70	Flush and clean, investigate if	1		-

Appendix G

Operation and Maintenance Program

Appendix G: Operations & Maintenance Programs

This Appendix to the Plan presents an overview of the routine and emergency procedures that the City of Langley employs for the operation and maintenance of its system. Specific recommendations for continued operation of the sewer utility are in accordance with State regulations and City policies.

G.1 SYSTEM RESPONSIBILITY AND AUTHORITY

A prerequisite to the delivery of efficient and reliable service to all customers of the City is a competent staff organized such that the responsibility for day-to-day and emergency operations is clearly defined and executed. The following is a summary of Langley's sewer utility organization.

G.1.1 Mayor and City Council

Overall responsibility for the City's utility operations lies with the elected officials. The City of Langley has a mayor and five City Council members who are responsible for operation, management, regulatory compliance and financial aspects of city services.

The City Council holds regular meetings which are open to the public. Meetings are held twice monthly on the first and third Monday of the month at City Hall.

G.1.2 Public Works Director

The City of Langley also employs a Public Works Director. This person has overall authority of all public works in the City.

G.1.3 Sewer Personnel

The Utilities Supervisor has the overall responsibility for the management of the sanitary sewer system and wastewater treatment plant. There are currently three other employees in the sewer department who share the responsibility to maintaining and operating the system.

G.1.4 Outside Consultants

The City of Langley retains the services of outside consultants for some of its engineering needs for its sewer system, surveying and legal counsel. In accordance with State law, engineering consultants are selected based on statements of qualifications periodically requested from specialists in sanitary sewer system engineering.

G.1.5 Other Assistance

Other assistance is required from time to time for specific City projects, maintenance and construction. The City maintains a roster of qualified contractors for small works projects and contracts with other service providers as required by City needs and in accordance with State law.

G.2 RECORD MAINTENANCE

Operation of a sewer utility requires consideration of long term records management in a format which is useful to the variety of staff members and outside consultants which use them. The City tracks their

daily, weekly, monthly, annual, and other frequency maintenance requirements. The City uses a sheet, attached at the end of the appendix, which lays out there schedules and shows what needs to be tracked, recorded, cleaned and maintained. The City maintains detailed records of periodic maintenance schedules and system attributes are kept on file.

G.3 PREVENTATIVE MAINTENANCE

Generally, preventive maintenance on the City's sewer system includes the following elements:

- All possible hazards are thoroughly and systematically identified.
- Potential failures are detected while still in their developing stages.
- Maintenance activities are prioritized and scheduled.
- Scheduled maintenance of pump stations is completed three times annually. Problems are addressed on an as needed basis.
- System cleaning and field and video inspection of the system, including lines and manholes, is scheduled and accomplished.
- City staff attend workshops and seminars in order to learn up-to-date techniques and materials.

The staff records maintenance information manually or with Excel spreadsheets.

G.4 EMERGENCY PROCEDURES

G.4.1 City Personnel

The City's sewer department maintains a sanitary sewer emergency response crew on 24-hour call. The sewer department duty telephone number (360-221-4246) is to allow the public to notify emergency crews at any time.

The City's on-call crew is available to answer any emergency that may occur within the system and has immediate response responsibility. This includes but is not limited to power failures, equipment failure at the treatment plant, response to lift station alarms, sewer back-ups and forcemain blockages, minor repair work and emergency response procedures required to sustain service. In the event of a major emergency, on-call staff are responsible for notifying other staff members as appropriate to conditions.

G.4.2 Supplies and Spare Parts

The City maintains an inventory of spare parts that are required for routine maintenance and/or emergency repairs. A list of suppliers for after hours and emergency repairs is maintained for response to major emergency conditions.

G.4.3 Outside Assistance

Langley maintains relationships with neighboring cities and the County for coordination during emergency events. In addition, the City has contacts at other agencies and jurisdictions which may be instrumental in emergency response.

G.5 SYSTEM VULNERABILITY

The City of Langley's sewer system consists of a collection system that conveys wastewater to the City's wastewater treatment plant for treatment and disposal.

Various components of the overall sewer system may be affected in the event of a natural or manmade disaster. System vulnerability includes loss of service, damage to property, and/or health risks which may be associated with failure of the individual components of the sanitary sewer system.

G.5.1 Treatment and Disposal

The City operates a wastewater treatment plant for the treatment and disposal of wastewater flows generated within the City. Any interruption in the treatment would likely result in discharge at the treatment plant site.

G.5.2 Sewer Mains and Trunks

Any pipeline is subject to clogging and, under certain circumstances, can break. Clogging of sewer lines can create backups in manholes and in severe cases can progress back to customer properties. Pipe breaks due to settlement, deterioration of pipe material or other causes can pollute the groundwater and result in excessive infiltration and inflow.

G.5.3 Electrical Power

Power to the City of Langley is provided by Puget Sound Energy. Historically, loss of power has not been a significant issue because the City maintains emergency on-site generators at pump stations No. 1 and 2 and has hook up potential at the Sunrise Beach Station.

G.6 OPERATIONAL RECOMMENDATIONS

The following operational recommendations are made for the City's sewer system.

- An on-site generator for the Sunrise Beach pump station.

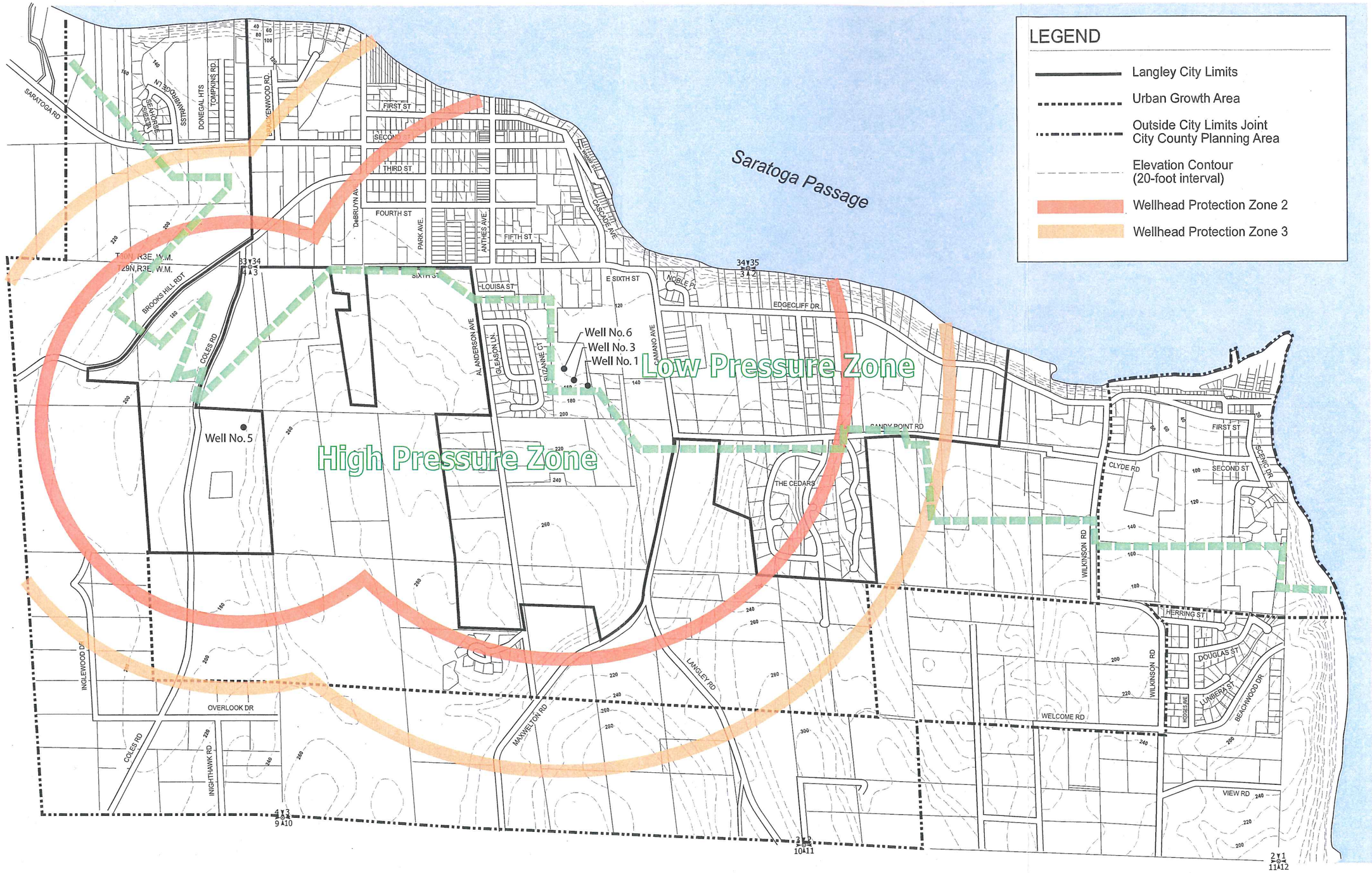
Appendix H

Approvals, Resolutions, and Plan Comments

Appendix I

Maps

33760396-Wellhead Protection Zones.ai



Source: City of Langley, November 2003

Note: City wells to be added
(Well No. 1, Well No. 3, Well No. 5 (Emergency Use Only), Well No. 6)

City of Langley
Comprehensive Plan Update
Source: City of Langley, November 2003

Figure 2-2
Wellhead Protection Zones

Appendix J

Pump Run Times

City of Langley - Pump Run Times

2012												
	Marina				PS #1				PS #2			
Month	Pump 1	Pump 2	Gallons	MG	Pump 1	Pump 2	Gallons	MG	Pump 1	Pump 2	Gallons	MG
January	5.4	5.2	146,280.00	0.15	26.3	27.7	1,620,000.00	1.62	33.1	33.2	1,989,000.00	1.989
February	4.8	4.7	131,100.00	0.13	26.8	28.3	1,653,000.00	1.65	34	33.6	2,028,000.00	2.028
March	6.7	5.3	165,600.00	0.17	35.6	37.7	2,199,000.00	2.20	45.5	44.2	2,691,000.00	2.691
April	5.4	5.1	144,900.00	0.14	28	31.2	1,776,000.00	1.78	37.5	34.9	2,172,000.00	2.172
May	7.9	7.5	212,520.00	0.21	35.1	36.9	2,160,000.00	2.16	44.8	43.5	2,649,000.00	2.649
June	5.5	5.1	146,280.00	0.15	23.4	25.6	1,470,000.00	1.47	29.7	30.8	1,815,000.00	1.815
July	10.2	9.5	271,860.00	0.27	33.1	36.5	2,088,000.00	2.09	42.4	42.8	2,556,000.00	2.556
August	8.2	7.8	220,800.00	0.22	27	28.4	1,662,000.00	1.66	34.7	33.5	2,046,000.00	2.046
September	7.3	6.7	193,200.00	0.19	27.1	28.2	1,659,000.00	1.66	33.9	31.9	1,974,000.00	1.974
October	5.7	5.2	150,420.00	0.15	26.9	29.7	1,698,000.00	1.70	35	34.3	2,079,000.00	2.079
November	5.2	4.7	136,620.00	0.14	30	34.2	1,926,000.00	1.93	38.6	38.5	2,313,000.00	2.313
December	5.1	4.8	136,620.00	0.14	35.1	38.3	2,202,000.00	2.20	44.2	45.3	2,685,000.00	2.685
Total	77.4	71.60	2,056,200.00	2.0562	354.4	382.7	22,113,000.00	22.113	453.4	446.5	26,997,000.00	26.997
Average Wet Flows	20.50	19.4	550,620.00	0.551	29.55	32.125	7,401,000.00	7.401	37.475	37.65	9,015,000.00	9.015
Average Dry Flows	31.20	29.1	832,140.00	0.832	27.65	29.675	6,879,000.00	6.879	35.175	34.75	8,391,000.00	8.391
Pump Capacity	230	230			500	500			500	500		
Flow - Gallons	1,068,120	988,080			10,632,000	11,481,000			13,602,000	13,395,000		
Flow - MG	1.07	0.99			10.63	11.48			13.60	13.40		

High Flow Month	July	271,860.00		Dec	2,202,000.00		March	2,691,000.00
Low Flow Month	Feb	131,100.00		June	1,470,000.00		June	1,815,000.00
		2.07			1.50			1.48

5-26-2015

City of Langley - Pump Run Times

2013												
	Marina				PS #1				PS #2			
Month	Pump 1	Pump 2	Gallons	MG	Pump 1	Pump 2	Gallons	MG	Pump 1	Pump 2	Gallons	MG/Month
January	5.5	5	144,900.00	0.14	36.5	38.6	2,253,000.00	2.25	45.4	46.8	2,766,000.00	2.766
February	3.6	3.3	95,220.00	0.10	26.5	28.3	1,644,000.00	1.64	32.9	31.9	1,944,000.00	1.944
March	4	3.9	109,020.00	0.11	27.5	31	1,755,000.00	1.76	35.7	35.5	2,136,000.00	2.136
April	4.8	4.7	131,100.00	0.13	29.2	33.5	1,881,000.00	1.88	37.2	38.5	2,271,000.00	2.271
May	3.6	3.4	96,600.00	0.10	23.5	27.4	1,527,000.00	1.53	31.4	30.5	1,857,000.00	1.857
June	3.8	3.8	104,880.00	0.10	21.7	24.8	1,395,000.00	1.39	27.7	29.3	1,710,000.00	1.710
July	6.6	6.8	184,920.00	0.18	30.9	34.9	1,974,000.00	1.97	40.9	39.4	2,409,000.00	2.409
August	4.3	4.4	120,060.00	0.12	21.6	22.8	1,332,000.00	1.33	27.9	27.2	1,653,000.00	1.653
September	6.1	6.1	168,360.00	0.17	31.9	33.2	1,953,000.00	1.95	39.9	39.5	2,382,000.00	2.382
October	4.5	4.4	122,820.00	0.12	27.8	33.7	1,845,000.00	1.84	37.9	37.9	2,274,000.00	2.274
November	3.2	3.2	88,320.00	0.09	21.1	25.4	1,395,000.00	1.40	28.3	28.4	1,701,000.00	1.701
December	5	5	138,000.00	0.14	29.2	33.2	1,872,000.00	1.87	38.4	38.3	2,301,000.00	2.301
Total	55	54.00	1,504,200.00	1.5042	327.4	366.8	20,826,000.00	20.826	423.6	423.2	25,404,000.00	25.404
Average Wet Flows	4.33	4.125	466,440.00	1.504	28.325	31.375	7,164,000.00	20.826	36.25	36.35	8,712,000.00	2.178
Average Dry Flows	5.20	5.275	578,220.00	0.117	26.525	28.925	6,654,000.00	1.791	34.1	33.85	8,154,000.00	2.038
Pump Capacity	230	230			500	500			500	500		
Flow - Gallons	759,000	745,200	1,504,200		9,822,000	11,004,000	20,826,000		12,708,000	12,696,000	25,404,000	
Flow - MG	0.76	0.75	1.50		9.82	11.00	20.83		12.71	12.70	25.404	

High Flow Month	July	184,920.00		January	2,253,000.00		January	2,766,000.00
Low Flow Month	November	88,320.00		August	1,332,000.00		August	1,653,000.00
		2.09			1.69			1.67