

Policies and Design Criteria

3-1. INTRODUCTION

The City of Fife (City) operates and plans sewer service for the City's sewer service area's residents and businesses according to the design criteria, laws and policies that originate from the United States Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and City code.

These design criteria and policies guide the City's operation and maintenance of the sewer system on a daily basis, as well as help the City's plan for growth and system improvements. Their overall objective is to ensure that the City provides high quality sewer service at a fair and reasonable cost to its customers. They also set the standards the City must meet to ensure that the sewer system is adequate to accommodate existing and future flows. The system's ability to handle these flows is included in **Chapter 5**, and the recommended improvements are identified in **Chapter 6**.

The City Council adopts regulations and policies. The City's policies cannot be less stringent or in conflict with those established by the federal and state governments. The City's policies take the form of ordinances, memoranda and operational procedures, many of which are summarized in this Chapter.

The City should maintain an updated sewer system plan that is coordinated with existing and proposed land uses so that new developments can be located where sufficient sewer system capacity exists or can be efficiently and logically extended.

The policies associated with the following categories are presented in this Chapter.

- Regulations
- Utility Planning Goals and Objectives
- Customer Service Policies
- Collection Systems Design Criteria and Policies
- Lift Station Criteria and Policies
- Operational Policies
- Organizational Policies
- Financial Policies

3-2. REGULATIONS

Clean Water Act

The Clean Water Act is the primary federal law in the United States that governs water pollution and was passed in 1972. The objective of the Clean Water Act is to restore and maintain the chemical, physical and biological integrity of the nation's water by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. The Clean Water Act also introduced the National Pollutant Discharge Elimination System (NPDES), which is a permit system for regulating point sources of pollution. The NPDES permit system is managed by the Environmental Protection

CHAPTER 3

Agency (EPA) in collaboration with state environmental agencies. The EPA can issue administrative orders against violators and seek civil or criminal penalties when necessary.

National Pollutant Discharge Elimination System Permit

The State of Washington regulates the federal effluent limitations with the National Pollutant Discharge Elimination System (NPDES) program. Wastewater discharged into the waters of the State shall have a NPDES permit from Ecology. The City's wastewater is conveyed to the City of Tacoma for further treatment and therefore, does not have a Fife specific NPDES permit. The City of Tacoma has agreed to provide treatment at their Tacoma Central Wastewater Treatment Plant No. 1 at an average dry weather flow of 1.75 mgd and a peak hydraulic flow of 5.25 mgd. A copy of this Agreement between the City and the City of Tacoma is included in **Appendix A**.

3-3. UTILITY PLANNING GOALS AND OBJECTIVES

The City's 2005 Comprehensive Plan includes a Utilities Element that presents "Utilities Goals, Policies and Implementation Strategies." Below are the policies and objectives excerpted from the City's 2005 Comprehensive Plan.

Goal 1 - "Maintain consistency between utility providers and the City's plans for growth."

Policy 1.1: Provide for coordination between the City and utility providers for consistency between the comprehensive system plans of each utility and the growth plans of the City.

Implementation 1.1.1: Retain copies of comprehensive system plans of each utility serving the City.

Implementation 1.1.2: Furnish utility providers with annual updates of population, employment, and development projections.

Policy 1.2: Provide utility facilities that are sufficient to support economic development.

Implementation 1.2.1: Give priority to utility projects that provide service to commercial and industrial areas identified in the Land Use Element and Capital Facilities Element of the Comprehensive Plan.

Policy 1.3: Require utility lines to be located underground wherever practicable.

Implementation 1.3.1: Amend City development regulations to require utility lines to be located underground.

Goal 2 - "Provide cost-effective utility services."

Policy 2.1: Allow new residential, commercial and industrial development only when required public facilities and services are available prior to or concurrent with development as indicated in the Capital Facilities Element.

Implementation 2.1.1: Amend development codes to allow for new commercial and industrial development only when required public facilities and services are available prior to or concurrent with development.

Policy 2.2: Encourage the joint use of utility corridors where lawful and in keeping with prudent utility practice.

Implementation 2.2.1: Promote the coordination of joint planning of new road construction and maintenance of existing roads with utility trenching activities.

Implementation 2.2.2: Provide timely notice of new construction, maintenance, and repair of existing roads to utility providers.

Implementation 2.2.3: Coordinate construction timing to minimize construction-related disruptions to the public and to reduce the cost to the public of utility delivery.

Goal 3 - “Protect the environment while providing for utility facilities.”

Policy 3.1: Locate new utility facilities away from, or in a manner compatible with, critical areas.

Implementation 3.1.1: Amend Critical Areas Ordinances to consider placement of utilities in environmentally sensitive areas.

Policy 3.2: Coordinate and integrate utility facilities with surrounding land uses to provide service to the neighborhood in which they are located and to reasonably avoid or mitigate the impacts of utility facility development.

Implementation 3.2.1: Amend development regulations where necessary to include standards for placement, design, construction and maintenance of facilities, with the intent to minimize utility facility impacts on surrounding neighborhoods.

Implementation 3.2.2: Require that the siting of proposed public facilities conform to all land use policies and regulations.

Implementation 3.2.3: Amend the Fife Municipal Code to require that pruning of trees and vegetation related to utility maintenance can be done in an environmentally sensitive, aesthetically acceptable manner, and according to professional arboricultural standards.

3-4. CUSTOMER SERVICE POLICIES

Policies

- Increase the capacity of the collection and treatment systems to reflect increased usage trends influenced by the City’s growth and economic development.

CHAPTER 3

- Increase the collection line capacity allocations to meet the needs of the City's future Urban Growth Area (UGA). Increase capacity allocations to reflect increased usage trends caused by the City's continued urban intensification and economic development.
- Work with Pierce County, Ecology and other public agencies to correct failed septic problems provided that the solutions do not create urban developments that are not desired or controlled by the City. The principal controller of urban development within the City's planning area is thereby the wastewater treatment plant capacity at the City of Tacoma that is available to be allocated to undeveloped lands within corporate boundaries.
- Continue the development of City ordinances regulating public use of the City sewer system and update as required.
- Consider additional incentives for water conservation and other sewer programs with cost implications.

Sewer Service and Connection

- Chapter 13.08 of the Fife Municipal Code (FMC) provides sewer regulations for the City's sanitary sewer system.
- The sewer service area is limited to the City limits.
- Provide sewer service to the properties within the City's sewer service area, provided all policies related to service can be met. Increase the collection line capacities to meet the needs of City residents and land within the UGA, as well as state and federal discharge standards.
- Sewer service rates, fees, connection charges, permit and inspection fees for connections outside the City limits shall be at the same rates, fees and charges as within the City limits plus a 50 percent surcharge except when sewer service is provided by the City to property within another city pursuant to an interlocal agreement. The interlocal agreement defines the terms and fees for sewer service provided by the City.
- Sewer system extensions, required to provide sewer service to proposed developments, shall be approved by the Department of Public Works and must conform to the City of Fife Sewer System Plan, Ecology requirements, Pierce County Health Department requirements, the City's Municipal Code and the City's most current, adopted Sanitary Sewer Engineering Standards. All costs of the extension shall be borne by the developer or applicant. The Sanitary Sewer Engineering Standards are included in **Appendix I**.
- Applicants for a development approval, except those exempted from concurrency under the Growth Management Act, must submit an application for a certificate of sewer concurrency along with the development approval application.
- The sewer collection system, lift station(s) and the City of Tacoma's treatment plant capacity will be considered when providing sewer availability to applicants.
- The City does not allow surface water runoff into the municipal sewer system.
- New sewer extensions may require some property owners to participate in utility local improvement districts.

- The owner of each lot or parcel of real property within a utility local improvement district or any portion of a lot or parcel located within a horizontal plane of 300 feet perpendicular to a permanent wastewater facility is required to connect all plumbing outlets from the building or structure directly to the public sewer at the owner's expense.

Septic Systems Policies

- Existing single-family homes with septic systems in good working condition, per the Pierce County Health Department, may continue to be used. All septic systems in the City shall be monitored per the Pierce County Health Department's regulations.
- Property owners with a failing septic system, as documented by the Pierce County Health Department, shall connect to the City's sewer system.
- Connection to the public sewer system is not required for single family homes that generate sewage that are located 300 feet or more away from the public sewer.

3-5. COLLECTION SYSTEM POLICIES AND DESIGN CRITERIA

Sanitary Sewer Design Criteria

- Standards for sewer system facilities are defined by WAC 173-240-050.
- All sewer lines within the City shall be designed in accordance with good engineering practice by a professional engineer with the minimum design criteria presented in the *Criteria for Sewerage Works Design*, prepared by Ecology, August 2008, or as superseded by subsequent updates. Chapter C1 of this document includes standards and guidelines for design considerations (minimum pipe sizes, pipe slopes and wastewater velocities), maintenance considerations, estimating wastewater flow rates, manhole locations, leak testing and separation from other underground utilities. These criteria have been established to ensure that the sanitary sewers convey the sewage and protect the public health and environment. The sewer lines shall also conform to the latest regulatory requirements relating to design.
- Sewers shall be designed and constructed in accordance with the City's most current Sanitary Sewer Engineering Standards.
- Pretreatment shall be provided when, in the opinion of the building official or the City of Tacoma, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts or any flammable wastes, sand, and other harmful ingredients. The pretreatment device shall be installed by the property owner. The selection and sizing of the pretreatment device shall be subject to approval by the City. Fife relies on Tacoma for the approval of the type and size of pretreatment devices.

Gravity Sewer Design Criteria

- All sewers shall be designed as a gravity sewer whenever feasible and buried at a minimum depth of 3 feet.

CHAPTER 3

- Layout of extensions shall provide for the future continuation of the existing system as determined by the City. The smallest diameter sewer allowed is 8 inches for submains and mains and 6 inches for laterals. A 6-inch diameter submain lateral is required for all commercial or business owners. For those buildings serving over ten units or for side sewers serving more than one building, side sewers shall be a minimum of 8 inches in diameter and must connect to a manhole.
- Manholes shall be 48 inches in diameter and will be spaced at intervals not to exceed 300 feet as set forth in the sewer engineering standards.
- Manholes shall also be located at changes in grade, direction and sewer size, and at intersections. All manhole rings and covers shall be water tight. All manholes shall have bolt-locking covers.
- New mains connecting to an existing main shall be made via a new or existing manhole.
- The minimum sewer main slope shall be as outlined in the Criteria for Sewage Works Design by Ecology (latest edition). The minimum slope may be reduced as approved by the public works director if the area cannot be otherwise served by gravity flow.
- Testing of the gravity sewer lines and manholes shall be completed in the presence of the City. The method of testing shall be at the option of the installer per the City's Sanitary Sewer Engineering Standards. Deflection testing shall be completed for sanitary sewers constructed of flexible pipe. The deflection shall not exceed 7.5 percent. A videotape inspection of all sanitary sewers constructed by the Developer shall be provided to the City.

Design Flow Rates

- New gravity sewer systems shall be designed on the basis of an average daily per capita flow of sewage of not less than 230 gallons per capita per day.
- All sewers will be laid on a grade to produce a mean velocity of at least 2 feet per second when flowing full.
- Maximum main line slope shall not induce velocities greater than 10 feet per second under peak day flows.
- Sanitary sewer system flows are composed of residential, institutional, business and commercial wastewater, along with infiltration and stormwater inflow. Sanitary sewer systems must be capable of conveying the ultimate peak flows of these sources.
- No overflows will be permitted.

Gravity Pipe Material and Roughness

- Gravity sewer main shall be of the type and depth as determined by the City and engineer during design.
- Sleds are required unless determined otherwise by the Public Works Director.
- Polyvinyl chloride pipe shall be encased in a steel or ductile iron casing when crossing under improvements where the ability to remove and replace pipe without disturbance to the improvement is needed. Casings are required, at a minimum, for the following scenarios: crossing under rockeries over 5 feet high, crossing under retaining wall footings over 5 feet wide and crossing under reinforced earth retaining walls. Casings shall also be required under limited access driveways and railroads.
- The Manning equation is used to design and analyze wastewater flow characteristics of sanitary sewers. The Manning roughness coefficient “n” varies depending on the pipe material; an “n” value of 0.013 shall be used unless deemed justifiable on the basis of research or field data submitted.

Separation between Sanitary Sewer and Other Utilities

- A minimum horizontal separation of 10 feet and minimum vertical separation of 2 feet is required between sewer and water lines (edge to edge).
- A minimum horizontal separation of 10 feet and minimum vertical separation of 1 foot is required between sewer and power, telephone or fiber optic lines (edge to edge).
- A minimum horizontal separation of 5 feet and minimum vertical separation of 1 foot is required between sewer and storm, gas or cable TV lines (edge to edge).
- The following guidance documents should be followed in difficult spacing or other situations:
 1. *Criteria for Sewage Works Design* by Ecology.
 2. *Pipeline Separation Design and Installation Reference Guide (ECY publication #06-10-029)* written jointly by Ecology and the Washington State Department of Health.

Design Period

- The design period is the length of time that a given facility will provide safe, adequate and reliable service. The design period selected is based on the economic life of a given facility, which is determined by the structural integrity of the facility, the rate of degradation, the replacement cost, the cost of increasing the capacity of the facility and the projected population growth rate serviced by the facility.
- Collection and interceptor sewers are designed for the peak development of a contributing area.
- The life expectancy for new sanitary sewers, using current design practices, is in excess of 50 years.

Force Main Design Criteria

- All force mains within the City shall be designed in accordance with good engineering practice by a professional engineer with the minimum design criteria presented in the *Criteria for Sewerage Works Design*, prepared by Ecology, August 2008, or as superseded by subsequent updates. Chapter C2 of this document contains design considerations for force mains.
- A control method to mitigate hydrogen sulfide odor and the buildup of sulfuric acid shall be used.
- A minimum velocity to maintain solids in suspension is 2 feet per second at average dry weather flow. A minimum scouring velocity of 3 feet per second should be maintained and velocities should not exceed 10 feet per second.
- Allowable force main pipe material shall include AWWA C900 pressure class 100. All materials shall be in accordance with the City's most current Sanitary Sewer Engineering Standards. Force mains shall have a minimum of 36 inches of cover.
- Extension layouts shall provide for the future continuation of the existing system as determined by the City. Main extensions may be extended to and through the side of the affected property fronting the main.
- Provisions to drain the force main for repair or to temporarily remove the force main from service shall be provided.
- Testing of the force main lines and manholes shall be completed in the presence of the City. The force main shall be tested to a hydrostatic pressure of 100 pounds per square inch (psi) per the City's Sanitary Sewer Engineering Standards.

Side Sewer Design Criteria

- Side sewers shall provide a single service; exceptions may be approved by the public works director. Special situations such as a school or business complex may have varying number of connections and shall be approved by the public works director. The property/building owner shall own and maintain sewer service from the building to the sewer main.
- The maximum distance between side sewer clean-outs shall be 100 feet. A minimum of two clean-outs per side sewer and/or change of 45 degrees of grade or alignment.
- Side sewers shall be installed in accordance with the City's most current Sanitary Sewer Engineering Standards.
- When a new sewer main is installed in front or alongside an existing property, a side sewer line shall be stubbed to the property line of all existing lots.
- Side sewers shall be four inches in diameter or greater for residential and six inches in diameter or greater for all other connections.

3-6. LIFT STATION POLICIES AND DESIGN CRITERIA

- Lift stations shall be designed in accordance with the City's most current Sanitary Sewer Engineering Standards and the Ecology's *Criteria for Sewage Works Design*.

- Lift stations shall be designed for peak design flow with the largest pump out of service.
- Lift stations should be designed for a 20-year design life.
- All future lift stations will be constructed to comply with the following minimum standards.
 1. All structures will be non-combustible, where practical.
 2. All structures will have adequate ventilation, insulation, lighting and work spaces necessary for on-site operation and repair.
 3. Sites will be designed to reduce vandalism and City liability.
 4. Each station will be equipped with a flow meter and all necessary instrumentation to assist personnel in operating and troubleshooting the facility.
 5. Emergency power capability will be provided at all lift stations.
 6. Each station shall be equipped with an emergency bypass to allow manual control.
 7. Each station shall address corrosion control.
 8. Each station shall include an intrusion alarm system
 9. Each station shall include a telemetry system that reports the alarms, history and statuses to the Supervisory Control and Data Acquisition (SCADA) system.
- Pumps will be operated automatically, with flexibility in pump start/stop settings.
- Pumps shall be as determined by the City Engineer.
- Stations will be operated with the provision for at least two methods of control to minimize system vulnerability.
- Sewer extensions within the UGA and City limits that require extremely deep sewer trenches to achieve gravity service may use local pump stations owned and operated by the City. All such facilities shall be designed and built in accordance with City standards.

3-7. OPERATIONAL POLICIES

Maintenance

- The City will ensure that existing deficiencies in the sewer system are upgraded.
- Equipment breakdown is given highest maintenance priority, and repairs should be made as soon as possible.
- Equipment should be replaced when it becomes obsolete.
- Worn parts should be repaired, replaced or rebuilt before they represent a high failure probability.
- Equipment that is out of service should be returned to service as soon as possible.
- A preventive maintenance schedule shall be established for all facilities, equipment and processes.

CHAPTER 3

- Spare parts shall be stocked for all equipment items whose failure will impact the ability to meet other policy standards.
- Tools shall be obtained and maintained to repair all items whose failure will impact the ability to meet other policy standards.
- A dry shop space shall be available to all maintenance personnel to maintain facilities.
- All maintenance personnel shall be trained in the procedures and techniques necessary to efficiently perform their job descriptions.
- Written records and reports will be maintained on each facility and item of equipment showing operation and maintenance history.

Temporary and Emergency Services

- Compliance with construction standards (not quality standards) may be deferred for temporary sewer service.
- Compliance with all standards may be deferred for emergency sewer service.

Reliability

- The City shall ensure that the sewer system is constructed, operated and maintained to protect against failures of power supply, treatment process, equipment or structure with appropriate backup facilities.

3-8. ORGANIZATIONAL POLICIES

Structure

- The City Manager has ultimate management authority for all of the City departments.
- The Public Works Director, or other appointee of the City Manager, is responsible for managing the City's utility systems.
- Planning, design, operations, maintenance and construction will be accomplished or overseen by the Public Works Department.
- The Public Works Superintendent is responsible for the day-to-day operations of the sewer system, including system operation and maintenance, personnel staffing and management, and reporting requirements.
- The City's Finance Department conducts billing and accounting functions.
- The sewer utility is responsible for adequate system operation and maintenance.

Staffing

- The sewer utility staffing levels are established by the City Council based on the financial resources of the City and needs of the sewer utility.
- Personnel certification and training will comply with State established standards.

Relationship with Other Departments

- The Finance Department works in conjunction with the Public Works Director. The Public Works Director and Finance Director coordinate all sewer-related financing requirements. The Finance Department is responsible for customer billing and payment collection, and collects connection fees for the utility and oversees project cost accounting. The Finance Department is responsible for employee records, union labor negotiations and salary schedules.
- The Police Department and/or Sewer Department are responsible for enforcing violations of the City's sewer ordinances.
- The Water Department is responsible for shutting off water service if a customer does not pay their sewer bill.

3-9. FINANCIAL POLICIES

General

- The City will set rates that comply with State regulations.
- Rates and additional charges established for the City should:
 - Be cost-based rates that recover historical, current and future costs as allowed by State Law associated with the City's sewer system and its services;
 - Be equitable charges to recover costs from sewer customers commensurate with the benefits they receive;
 - Be an adequate and stable source of funds to cover the current and future annual cash needs of the sewer utility; and
 - Not subsidize the operation of other City departments.
- The City's existing customers will pay the direct and indirect costs of operating and maintaining the sewer facilities through user rates. In addition, the user rates will include debt service incurred less the general facilities charge revenue offset and as required by debt covenants to finance the capital assets of the utility.
- New customers seeking to connect to the sewer system will be required to pay a connection charge for an equitable share of the cost of the system's Capital Improvement Plan. This revenue will be used to finance the Capital Improvement Plan, in conjunction with rate revenue.
- The City will maintain information systems that provide sufficient financial and statistical information to ensure conformance with rate-setting policies and objectives.
- The user charges must be sufficient to provide cash for the expenses of operating and maintaining the utility. To ensure the fiscal and physical integrity of the utility, an amount should be set aside each year for capital expenditures from retained earnings. That is, an amount should be set aside to cover some portion of the depreciation of the physical

plant. The amount may be transferred from the operating fund to the capital fund for general or specific purposes.

- A working capital reserve will be maintained to cover unanticipated emergencies, bad debts and fluctuations in cash flow.
- The sewer rates will be based on the cost of providing sewer service. Service requirements relate to the total volume of water used, peak rates of use and other factors.
- The City's fees and charges should be calculated for the service area as a whole. Rates will be the same regardless of service location for existing customers. Rates charged shall be assessed a rate consistent with the FMC.
- The City will consider additional incentives for water conservation, surcharge for service outside the City limits, new sources of employment and other sewer programs with cost implications. The City currently has a rate structure defining the methodology for monthly service charge, capital facilities charges, service connection and various other fees related to operation and maintenance of the system. A rate differential exists between residential and non-residential customers as well as for elderly.

Connection Charges

The owners of properties that have not been assessed, charged or have not borne an equitable share of the cost of the sewer collection and sewer treatment facilities shall pay one or more of the following connection charges prior to connection to a sewer main.

1. **Latecomers Fees:** Latecomers fees are negotiated with the City, developers and property owners for the reimbursement of a pro rata portion of the original costs of sewer system extensions and facilities and are documented in a Recovery Contract or City resolution, depending on the application.
2. **Connection Charge:** The connection charge shall be assessed against any property connecting to the sewer system. This charge is for the major facilities that deliver the sewage to a wastewater treatment facility and for the facilities to treat and dispose of the sewage. This charge reimburses customers who have paid for the facilities described and for building capacity to accommodate growth.
3. **Developer Extension Charges:** These charges are for the administration, review and inspection of a developer extension project.
4. **Developer Funded Improvements:** These are costs incurred by a developer to upgrade and increase capacity in the sewer system to accommodate the increase in flow from the proposed development.