July 8, 2016

Mr. G. Matt Reynolds, Assistant Director  
City of Anacortes Public Works Department  
P.O. Box 547  
Anacortes, WA 98221

Dear Mr. Reynolds:

Re: City of Anacortes 2015 Wastewater Comprehensive Plan

In accordance with RCW 90.48.110 and WAC 173-240-030, Ecology hereby approves the above-referenced general sewer plan. Anacortes submitted the Plan in electronic format on June 29, 2016. A copy of the approved title page is enclosed for your records.

Sewage facilities within the planning area boundary must be constructed according to the approved general sewer plan or amendments thereto. Engineering reports and plans/specifications for construction of planned collection, treatment, and disposal facilities must be submitted to this department for review and approval in accordance with Chapter 173-240 WAC.

Engineering reports and plans and specifications for sewer line extensions, including pump stations, need not be submitted for approval. Prior to construction, you are required to submit a written description of the project and written assurance that the extension is in conformance with the general sewer plan. In the following situations Ecology approval is necessary for sewer line extensions prior to construction:

• The proposed sewers or pump stations involve installation of overflows or bypasses; or
• The proposed sewers or pump stations discharge to an overloaded treatment, collection, or disposal facility.

If you have any questions concerning this approval, please contact Laura Fricke at lfri461@ecy.wa.gov or (425) 649-7062.
Sincerely,

Kevin C. Fitzpatrick
Water Quality Section Manager

Enclosure
City of Anacortes

Wastewater Comprehensive Plan
2015
City of Anacortes
2015 Wastewater Comprehensive Plan

This 2015 Sewer Comprehensive Plan for the City of Anacortes has been prepared under the direction of the following Registered Professional Engineer:

G. Matt Reynolds P.E.
City of Anacortes
PO Box 547
Anacortes Washington 98221

APPROVED
DEPARTMENT OF ECOLOGY

City of Anacortes
Sanitary Sewer Plan 2015
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City of Anacortes
Sanitary Sewer Plan 2015
Chapter 1- Introduction

This Wastewater Comprehensive Plan (Plan) for the City of Anacortes addresses comprehensive planning needs for wastewater collection, transmission, treatment, and disposal for the next twenty years. This Sewer System Plan has been prepared to serve as a guide for planning and designing future sewage facilities and to address planning needs for the next 20 years. The City provides sewage services to all areas of the City. The City serves approximately 7,289 locations in the service area with a 2015 population of 16,398\(^1\). A location map is shown in Exhibit 1-1.

Purpose and Goals

The 2015 Sewer Plan is prepared in accordance with the provisions of the Revised Code of Washington (RCW) Section 90.48, Water Pollution Control; Washington Administrative Code (WAC) Section 173-240-050, General Sewer Plan; and WAC 173-240-060, Engineering Report. The Sewer Plan provides a comprehensive guide to assist the City with managing and operating the sewer system and coordinating expansion and upgrades to the infrastructure over the next 20 years. This will allow the City to continue to provide high quality service to its customers, and protection to the environment. The plan will also provide information to the public regarding City plans for the sewer system.

This plan's goals are to:

- Prepare a plan that is consistent with the City's Comprehensive Plan and the requirements of the Growth Management Act.
- Prepare a plan that is consistent with the requirements of the State Department of Ecology as set forth in WAC 173-240-050.
- Provide the City with a guide to evaluate the impacts of proposed and future development and land use changes on the sewer system.
- Develop a document which can be updated periodically as additional information on the sewer system is obtained.
- Estimate the effect of future land uses and population trends on wastewater flows.
- Identify existing sewer system deficiencies.
- Develop a capital improvement program which identifies priorities for construction and funding.

\(^1\) Source: Skagit Council of Governments
City of Anacortes
Sanitary Sewer Plan 2015
Required Element Components

Pursuant to WAC 173-240-050, General Sewer Plans must contain the following:

1. The purpose and need for the proposed plan.
2. A discussion of who will own, operate and maintain the systems.
3. The existing and proposed service boundaries.
4. Layout maps including the following:
   a. Boundaries. The boundary lines of the municipality to be serviced by sewer, including a vicinity map.
   b. Existing sewers. The location, size, slope, capacity, direction of flow of all existing trunk sewers, and the boundaries of the areas served by each.
   c. Proposed sewers. The location, size, slope, capacity, direction of flow of all proposed trunk sewers and the boundaries of the areas to be served by each.
   d. Existing and proposed pump stations and force mains. The location of all existing and proposed pumping stations and force mains, designated to distinguish between those existing and proposed.
   e. Topography and elevations. Topography showing pertinent ground elevations and surface drainage must be included, as well as proposed and existing streets.
   f. Streams, lakes and other bodies of water. The location and direction of flow of major streams, the high and low elevations of water surfaces at sewer outlets, and controlled overflows. All existing and potential discharge locations should be noted.
   g. Water systems. The location of wells and other sources of water supply, water storage reservoirs and treatment plants and water transmission facilities.
5. The population trend as indicated by available records, and the estimated future population for the stated design period. Briefly describe the method used to determine future population trends and the concurrence of any applicable local or regional planning agencies.
6. Any existing domestic or industrial wastewater facilities within twenty miles of the general plan area and within the same topographical drainage basin containing the general plan area.
7. A discussion of any infiltration and inflow problems and a discussion of actions that will alleviate these problems in the future.
9. List of all establishments producing industrial wastewater, the quantity of wastewater and periods of production, and the character of the industrial wastewater insofar as it may affect the sewer system or treatment plant. Consideration must be given to future industrial expansion.
10. Discussion of the location of all existing private and public wells, or other sources of water supply, and distribution structures as they are related to both existing and proposed domestic wastewater treatment facilities.

11. Discussion of the various alternatives evaluated, and a determination of the alternative chosen, if applicable.

12. A discussion, including a table that shows the cost per service in terms of both debt service and operation and maintenance costs, of all facilities (existing and proposed) during the planning period.


14. A statement regarding compliance with the State Environmental Policy Act (SEPA).

Environmental Assessment

The City has determined that this plan does not have a probable significant adverse environmental impact on the environment and has issued a Determination of Non Significance under WAC 197-11-340(2). This determination was made after review of the completed environmental checklist and other information. The environmental determination issued by the City of Anacortes is provided in Appendix A.

Ownership and Operation of the System

The City of Anacortes owns and operates all parts of the present sewer system in the Anacortes area. The system includes a secondary treatment plant, 23 pump stations, and the sewer collection system. The City will continue to own and operate its wastewater collection system, as well as expansions of the system as identified in the Plan for the urban growth area. Operations and maintenance of the system will also continue to be the responsibility of the City.

There are no adjacent public sewer systems in the area. The two neighboring oil refineries own and operate sewage treatment systems on March Point for the refineries. These systems are not tied or connected to the City's system and are permitted separately by the Department of Ecology.

Scope

The Plan is organized into eight chapters as follows:

Chapter 1, Introduction, includes descriptions of the purpose and scope of the Plan and provides background information used to address issues discussed in the Plan.
Chapter 2, Planning Considerations, includes a description of the study area boundaries and physical conditions. The chapter also reviews general planning issues, including growth management, land use, and zoning, and provides current and projected population.

Chapter 3, Regulatory Requirements, consists of descriptions of pertinent regulations that apply to the City’s wastewater collection, treatment and effluent disposal facilities.

Chapter 4, Existing Wastewater Facilities, describes and assesses the existing components of the collection system, wastewater treatment plant, and sewer agreements with adjacent jurisdictions.

Chapter 5, System Evaluation, includes analysis of wastewater flows and loading, existing wastewater plant capacity, and wastewater collection system capacity.

Chapter 6, Operation and Maintenance, provides an overview of the City’s operation and maintenance program including a summary of existing and future staffing needs.

Chapter 7, Capital Improvement Plan, recommends sewer system and wastewater treatment plant improvements and provides cost estimates and an implementation schedule for those improvements.

Chapter 8, Financial Program, provides an assessment of current financial status of the utility and discusses wastewater rates and charges, historic and projected cash flows, and capital funds available for future improvements.

History of the Sewer System

It is unknown when the first sewers were constructed in Anacortes. However, by 1950, a considerable portion of the downtown system had been installed and was discharging raw sewage into Guemes Channel and Fidalgo Bay at approximately 9 locations. The development of the City’s wastewater facilities parallels the growth of its population and land area. The early beginnings of the City started in the settlements of the Ship Harbor area in the 1870’s. In 1889, the quiet settlement was thrust into a boom period based on speculation that a western terminal of the transcontinental railroad would be developed at Anacortes. In less than a year, the population swelled from under 1,000 to 3,000 people. Anacortes became an incorporated City in 1891. From 1900 to 1950, growth of the City’s economy and population was dependent upon development and expansion of two natural resources: lumber and fisheries. In the 1950’s,
advancing technology and depleted natural resources were beginning to erode the strength of the local natural resource base. However, two new factors were introduced that helped boost the local economy: petroleum refining and tourist/marina activity. In the early 1950’s, with a decline in wood products and fisheries, the Anacortes population began to decrease. In 1953, with development of the Shell and Texaco refineries on March Point, population growth began an upward trend reaching 8,414 people by 1960.

During the middle of the 1950’s an extensive sewer construction program was commenced. Trunk sewers were constructed and a substantial portion of the core collection system was installed. Raw sewage was still being discharged to the receiving waters but a comminutor, grit chamber, and pump station were added at the 3rd and R Avenue site to form the basis of the sewage treatment plant.

In 1963, the City expanded the R Avenue treatment facility adding a clarifier, digester and chlorination facilities. A pump station was added at B Avenue to collect sewage in that area and send it to the plant.

In 1969 the City constructed a small treatment plant in Skyline. It consisted of a sewage lift station, comminutor, grit chamber, clarifier/digester, and chlorine facilities.

In 1992 the City constructed the current secondary treatment plant. The R Avenue and Skyline treatment facilities were taken out of service.

In 2000, the sewer collection system was extended out to the March Point area, with the addition of Pump Stations 18, 19 and 20, a force main along Fidalgo Bay Road, and associated gravity sewer.

**Preceding Sanitary Sewer Plan**

Economic and Engineering Services (EES) completed the last City Comprehensive Sewer Plan in 1993². The plan found the sewer system to be in generally good condition and emphasized focusing on controlling possible overloading of the Wastewater Treatment Plant. Specific areas discussed for improving in this area were further reduction of inflow and infiltration and industrial wastewater discharge.

Table 1-1 provides a list of improvements made to the sewer system after the 1993 plan was completed.

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² Source: 1993 City of Anacortes Comprehensive Sewer Plan, EES Inc.
City of Anacortes

Sanitary Sewer Plan 2015
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<td>Sewer Rehabilitation Evaluation</td>
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<td>&quot;V&quot; Ave &amp; &quot;D&quot; Ave Sewer Extension</td>
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<td>Clearidge Pump Station Modifications</td>
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<td>Pump Station 5 Upgrade</td>
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<td>Pump Station Radio Telemetry System</td>
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<td>Replacement of Pump Stations 8 &amp; 9</td>
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<td>Convert Chlorination System to meet regulations</td>
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<td>Continuous Emission Monitoring System for Incinerator</td>
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<td>Pump Station 16 Emergency Power Generation</td>
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<td>Pump Station 15 Improvements – 12th and B</td>
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<td>Q and O Avenue/23rd to 24th Sewer Replacement</td>
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<td>WWTP Blower Replacement</td>
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<td>Pump Station 18 Controls Upgrade</td>
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<td>Pump Station 20 Upgrade</td>
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<td>WWTP Incinerator Compressor Replacement</td>
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<td>Pump Station 21 Installation</td>
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<td>Pump Station 5 Installation</td>
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<td>13th St. CSO removal</td>
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<td>WWTP Odor Control</td>
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City of Anacortes

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<td>WWTP Sludge Dewatering</td>
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<td>Pump Station 22 Upgrade</td>
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Chapter 2 – Planning Considerations

Introduction

The configuration of a sewer system can be influenced by many factors including development trends, political considerations, and topography. Sewer lines follow natural drainage patterns to maximize gravity flow. The sewer plan establishes a sewer service area based on topography and the City’s growth objectives. Specific land uses provide flows and loadings to the sewer facilities. This chapter provides information relating to planning criteria needed to develop and project into the future sewer needs for the City.

Planning Period

The planning period for the Sewer Plan should be long enough to be useful for an extended period of time, but not so long to be impractical. This plan includes 6-year and 20-year planning periods to allow for the implementation of the City’s capital improvement plan. The 6-year planning period extends from 2016 to 2021 and the 20-year planning period extends from 2016 to 2035.

Plan Service Area

The City of Anacortes is located in western Skagit County on the northern portion of Fidalgo Island. The City encompasses approximately 9800 acres of urban, rural, and park lands. Development is distributed along the west, east, and north shorelines, and at March Point. The City has 12.5 miles of saltwater shoreline along Burrows Bay, Guemes Channel, and Fidalgo Bay. City parks and community forest lands account for nearly half of the City’s total area. The service area for the Anacortes Sewer System Plan consists of the City limits boundary and the Urban Growth Area. The service area is shown in Exhibit 2-1.
Natural Features of the Planning Area

Topography and Geography
The City is bounded on three sides by twelve and one-half miles of saltwater shoreline of Burrows Bay, Rosario Strait, Guemes Channel, and Fidalgo Bay. There are four fresh-water lakes: Cranberry Lake, Cannery Pond, Whistle Lake, and Heart Lake. Elevations within the City vary from sea level to 600-feet in the southwest quadrant and to the top of the 1270-feet of Mt Erie, offering a commanding view of the surrounding region. Exhibit 2-2 shows the topography of the City.

Geology and Soils
The major soil unit for most of the soils is Bow-Coveland-Swinomish. It is characterized by a terrace-like appearance, with slopes from 0 to 30 percent. Bow soils are on glacial remnant terraces. They are very deep and somewhat poorly drained, and were formed in glacial drift over glacial lake sediment with a mantle of volcanic ash. Coveland soils are located in swales on glaciated hills. The soils are very deep and somewhat poorly drained. They also formed in glacial lake sediment. Swinomish soils are found on glaciated hills and are moderately deep and moderately well drained. They formed glacial till with an admixture of wind-deposited silts and volcanic ash. Till soils cover approximately 60% of the land area. The hydrologic soil groups in Anacortes are shown in Exhibit 2-3.

---

3 Source: Anacortes Comprehensive Plan 2014
4 Department of Ecology
City of Anacortes
City of Anacortes

2015 Wastewater Comprehensive Plan Update

Topography
EXHIBIT 2-2

Annexation "SR20" Area
Climate

Anacortes temperatures are relatively mild. Summer daytime mean temperatures are in the 70's with nighttime temperatures in the 50's. Maximum temperatures reach 80 to 85 degrees, with a few 90 to 100 degree days recorded. The highest temperatures and lowest relative humidity are recorded during periods of easterly winds. December and January are the coldest months, with average minimum temperatures in the upper 30's.

The prevailing wind direction is from the southeast in winter and southwest in summer. During late spring and summer, a prevailing westerly and northwesterly flow of air into Puget Sound brings a dry season beginning in May which reaches a peak in July. In late fall and winter, a prevailing southwesterly and westerly air flow from the Pacific Ocean results in a wet season beginning in October which lasts until the beginning of the dry season in May. During winter, the combined influence of low pressure systems off the Pacific coast and cold air from the Fraser River Canyon produce strong northeasterly winds. Although it is not uncommon to have 30 to 40 knot winds under these conditions, the short fetch in the Anacortes area usually limits wind generated wave heights to not more than six feet. Wind gusts up to 73 miles per hour and sustained westerly velocities up to 54 miles per hour have been recorded.

Total precipitation for December is less than 1.9 inches in one winter out of ten; it exceeds 6.5 inches in one winter out of ten. Annual precipitation is less than 18 inches in one year out of ten and it exceeds 33 inches in one out of 10 winters. Most winter precipitation falls as rain, but it is not uncommon to have 3 to 10 inches of snow. Thunderstorms occur 5 to 10 days a year. Most occur in the summer, but they have been recorded in each month of the year.5

Geologic Hazard Areas

Geologic hazardous areas are areas that because of their susceptibility to erosion, sliding, earthquakes, or other geological events are not suited for commercial, residential, or industrial development because of public health or safety concerns. The Washington State Department of Ecology website provides "Slope Stability Maps" for Skagit County based on the Coastal Zone Atlas. Steep bluffs, identified “unstable” areas by the Coastal Zone Atlas, line the north Anacortes shoreline along Guemes Channel for about two miles. Unstable slopes are considered unstable because of geology, groundwater, slope and/or erosional factors.

Areas classified as “Modified” include much of Skyline, the Washington State Ferry Terminal, the northeast Guemes Channel Shoreline, and the west

5 Anacortes Comprehensive Plan 2007

City of Anacortes

Sanitary Sewer Plan 2015
shor line of Fidalgo Bay. Modified slopes are highly modified by human activity and include areas of significant excavation or filling. Slope response to a combination of natural processes and human activities may be unpredictable.

Most of the shoreline surrounding March Point is considered "stable", with pockets of "modified" areas.

The Anacortes Municipal Code (Ch. 17.70) and Shoreline Master Program regulate and categorize geologic hazard areas as Erosion Hazard Areas, Landslide Hazard Areas, Seismic Hazard Areas, Mine Hazard Areas, Volcanic Hazard Areas, Tsunami Hazard Areas and Other Hazard Areas. For new development, a qualified professional is required to submit a report categorizing the hazard area type and evaluating the proposed development for consistency with the city's regulations.

Geologic Hazard Areas are shown in Exhibit 2-4.  

6 Washington State Department of Ecology Slope Stability Maps
City of Anacortes

San Sewer Plan 2015
Sensitive Areas
Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The National Wetlands Inventory documents potential wetland areas in and around the City. Individual wetlands are delineated and categorized on a project by project basis. Exhibit 2-5 illustrates the potential wetlands identified by the National Wetlands Inventory.

The City has a Critical Areas Ordinance which provides more detailed information regarding regulation of development activities in and adjacent to wetlands.

Water Bodies and Major Streams
Anacortes is located on Fidalgo Island, easternmost of the San Juan Islands. Fidalgo Island is bordered by Fidalgo Bay, Guemes Channel, Burrows Bay, and Padilla Bay. Within the City limits there are 4 fresh water lakes; Cranberry Lake, Cannery Pond, Whistle Lake, and Heart Lake. There are also 10 stream/creeks that run through the City. Exhibit 2-6 shows the locations of the major water bodies and streams.

Potable Water System
The City owns and operates a Class A water system which serves a much larger area than the sewer system boundary. The water system serves approximately 56,000 customers, with regional customers that include 2 refineries, the Skagit PUD, the town of La Conner, the Swinomish Tribal Community, and the City of Oak Harbor, including the Naval Air Station Whidbey. Exhibit 2-7 shows the major components of the City’s water system and other service providers in the area.

Within the sewer system boundaries, there are 35 private wells (Exhibit 2-8). The City has no public water wells for public water consumption. Heart Lake once served as the single source of potable water for the City. Heart Lake is no longer operated as a potable water site. The water is captured and treated at a water treatment plant located on the Skagit River in Mt. Vernon and transmitted to the City and all our customer service points. Within the City there are 3 water reservoirs and 3 pump stations along with 216 miles of distribution piping.
City of Anacortes 2015 Wastewater Comprehensive Plan Update

Wetlands EXHIBIT 2-5

Annexation "SR20" Area
City of Anacortes

2015 Wastewater Comprehensive Plan Update

Water System
EXHIBIT 2-7

City of Anacortes
Sanitary Sewer Plan 2015
City of Anacortes
Sanitary Sewer Plan 2015
Infiltration & Inflow

In addition to the flows directly discharged into the system from the system users, there are the issues of Infiltration and Inflow (I&I). Infiltration is the additional water that enters the wastewater collection through leaky sewer pipes and/or manholes. Infiltration is tied closely to the groundwater elevation and the condition of the collection system piping and manholes. Inflow enters the system from storm water sources that are connected directly to the sanitary sewer system, such as, combined storm and sanitary sewers, catch basins, roof drains, foundation drains, and improperly set or otherwise leaky covers. Inflow generally corresponds to actual rainfall events. Infiltration and inflow are typically considered together because of the difficulty in estimating them as separate sources of additional water. Some of the effects of I&I are reduced treatment efficiency, larger sizing required of piping and treatment facilities, and potential overflows of the collection system.

The City of Anacortes began an I&I reduction program in the mid-1970s with the "Sewerage System Infiltration/Inflow Analysis" prepared by STR Engineers (October 1975). As a result of this study and subsequent studies, it was determined that the most serious problem to be addressed in the sewer collection system was to reduce the quantity of storm infiltration that entered the sanitary system. The 1975 STR study estimated that as much as 32 MGD could enter the collection system during heavy rainfall conditions.

In 2008, the City began a sequence of rehabilitation projects to the "L" Basin which was noted to have one of the worst I&I problems after monitoring was completed the year before. A process called Cast-In-Place piping was used over 3,000 feet of clay and concrete pipe in the basin. In 2013, the rehabilitation of the "L" Basin was finished by conventional construction and replacement of the remaining 4,200 feet of pipe. In the winter of 2009, a considerable decrease in flow at the Wastewater Treatment Plant during the heavy rainy season was observed.

The City is committed to continuing its efforts to reduce inflow and infiltration into the wastewater collection system and continues to budget annually for significant I&I reduction projects.

Population and Growth

The rates of growth and development are significant factors in estimating expenditures and timing for development of sewer management facilities.
The Growth Management Act (GMA) requires that Washington counties consult cities and allocate population growth within a range of projections provided by the Washington State Office of Financial Management (OFM). The pending Skagit County and cities comprehensive plan updates due June 30, 2016, are seen as an opportunity to update the countywide population targets and allocations. Skagit County and its cities are planning for a 20-year period that for GMA purposes will be the growth base year of 2015 to a horizon year of 2036.

For Anacortes, the initial population growth allocation for the year 2036 is 22,293 people, which represents an increase of 5,895 from the 2015 estimated population of 16,398. As of the date of this writing, this allocation has not yet been formally adopted; however, the Comprehensive Plan update currently underway is utilizing the initial allocation for planning purposes based on direction from the City Council.

The Anacortes School District has 6 schools, 5 of which are in the City Limits. Each school and its student population is shown in Table 2-1.

<table>
<thead>
<tr>
<th>School</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitney Elementary</td>
<td>109</td>
</tr>
<tr>
<td>Fidalgo Elementary (outside city limits)</td>
<td>426</td>
</tr>
<tr>
<td>Island View Elementary</td>
<td>438</td>
</tr>
<tr>
<td>Mt. Erie Elementary</td>
<td>436</td>
</tr>
<tr>
<td>Anacortes Middle School</td>
<td>450</td>
</tr>
<tr>
<td>Anacortes High School</td>
<td>850</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>2,709</strong></td>
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</tbody>
</table>

**Table 2-1**

School Populations

**Land Use**

Land use within the City of Anacortes has generally developed in a suburban and urban manner. Planned growth distribution and land use designations are incorporated in the Anacortes 2012 Comprehensive Plan. Exhibit 2-9 illustrates the land use designations within the Urban Growth Area and Table 2-2 summarizes the land use classifications.

---

7 BHRK Consulting, Skagit County Growth Projections Summary of Methods and Results, July 2014
City of Anacortes
City of Anacortes

Comprehensive Plan Update

Land Use - Zoning

EXHIBIT 2-9

Annexation "SR20" Area
**Table 2-2**  
Land Use Classifications

<table>
<thead>
<tr>
<th>Designation</th>
<th>Acreage</th>
<th>Percent of total UGA</th>
<th>Max. Density</th>
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<td>AZ</td>
<td>119</td>
<td>1.2%</td>
<td></td>
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<tr>
<td>C</td>
<td>127</td>
<td>1.3%</td>
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<tr>
<td>CBD</td>
<td>59</td>
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<td>CM2</td>
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</tr>
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<td>I</td>
<td>115</td>
<td>1.2%</td>
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<td>LM</td>
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<td>LM1</td>
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</tr>
<tr>
<td>P</td>
<td>3187</td>
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<tr>
<td>R1</td>
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<td>Total</td>
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Chapter 3- Regulatory Requirements

The purpose of this chapter is to identify and summarize the regulations that are applicable to the planning, design, and approval of the capital improvements discussed in this Plan. This Chapter does not describe each regulation in detail; rather, it addresses important elements of the regulations that affect the planning and design process. Subsequent sections of this Plan address technical requirements of the regulations at a level of detail appropriate for the evaluation provided by that section.

Federal Clean Water Act/National Pollutant Discharge Elimination System
The Federal Water Pollution Control Act (CWA), Title 33 United States Code, Section 1342 et seq, is the principal law regulating the water quality of the nation's waterways. The National Discharge Elimination System (NPDES) is established under Section 402 and subsequent amendments of the CWA. Under Chapter 90.48 RCW and the CWA, the State of Washington Department of Ecology issues and administers NPDES permits for the United States Environmental Protection Agency (EPA). Most NPDES permits have a five-year life span and place limits on the quantity and quality of pollutants that may be discharged. The City's current wastewater NPDES permit, No. WA-002025-7, is attached as Appendix B. The City's current NPDES permit effluent limits are discussed in Chapter 4.

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

Federal Clean Air Act
The Federal Clean Air Act requires all wastewater facilities to plan to meet the air quality limitations of the region. The City falls in the jurisdiction of the Northwest Clean Air Agency, who have issued an Order of Approval to Construct #269b related to the operation of the WWTP's incinerator. A copy of the permit is included in Appendix C.
Washington Administrative Code (WAC) and Revised Code of Washington (RCW)
Regulations of Washington State executive branch agencies are issued by authority of statutes, and regulations are a source of primary law. The WAC codifies the regulations and arranges them by subject or agency. The Revised Code of Washington (RCW) is the compilation of all permanent laws in force.
WACs and RCWs relevant to the wastewater system include, but are not limited to, the following:

NPDES Permit, WAC 173-220
The purpose of this chapter is to establish a state individual permit program, applicable to the discharge of pollutants and other wastes and materials to the surface waters of the state, operating under state law as a part of the National Pollutant Discharge Elimination System.

Submission of Plans and Reports for Construction of Wastewater Facilities, WAC173-240
Prior to construction or modification of domestic wastewater facilities, engineering reports and plans, and specifications must be submitted to and approved by Ecology. This regulation outlines procedures and requirements for the development of an engineering report, which thoroughly examines the engineering and administrative aspects of a domestic wastewater facility project. This regulation defines a facility plan as described in federal regulations, 40 CFR Part 35, as an engineering report.

Key provisions of WAC 173-240 are provided below:
• An engineering report for a wastewater facility project must contain everything required for a general sewer plan unless an up-to-date general sewer plan is on file with Ecology.
• An engineering report shall be sufficiently complete so that plans and specifications can be developed from it without substantial changes.
• A wastewater facility engineering report must be prepared under the supervision of a professional engineer.

Criteria for Sewage Works Design, Washington State Department of Ecology (CSWD)
Ecology has published design criteria for collection systems and wastewater treatment plants, also known as the “orange book”. While these criteria are not legally binding, their use is strongly encouraged by Ecology since the criteria are used by the agency to review engineering reports for upgrading wastewater treatment systems, and WAC 173-240-040 requires reasonable consistency with the CSWD. These design criteria, primarily emphasize unit processes through secondary treatment, and also includes criteria for planning for, and design of, wastewater collection systems. Any expansion or modification of the City of Anacortes’s collection system and/or treatment plant will require continued conformance with Ecology criteria.

City of Anacortes
Sanitary Sewer Plan 2015
Certification of Operators of Wastewater Treatment Plants, WAC 173-230
Wastewater treatment plant operators are certified by the State water and wastewater operators' certification board. The operator assigned for the overall responsibility of operation of a wastewater treatment plant is defined by WAC 173-230 as the "operator in responsible charge." This individual must be State certified at or above the classification rating of the plant. The City's wastewater treatment plant is currently assigned a Class II rating and the operating staff assigned to the plant has the required certification.

Reclaimed Water Standards RCW 90.46
The standards for the use of reclaimed water are outlined in RCW 90.46 and in a separate document published by the Washington State Departments of Health and Ecology entitled "Water Reclamation and Reuse Standards." Reclaimed water is the effluent derived in any part from wastewater from a wastewater treatment system that has been adequately and reliably treated, such that it is no longer considered wastewater and is suitable for a beneficial use or a controlled use that would not otherwise occur. The legislature has declared that "the utilization of reclaimed water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife habitat creation and enhancement purposes (including wetland enhancement) will contribute to the peace, health, safety, and welfare of the people of the State of Washington." RCW 90.48.112 requires consideration of reclaimed water in general sewer plans. Due to the nature of land use on Fidalgo Island, and the location of the City's wastewater plant, an economically viable use of reclaimed water from the Anacortes has not yet been found.

Water Quality Standards for Surface Waters of the State WAC 173-201A
WAC 173-201A establishes water quality standards for surface waters within the state of Washington consistent with public health and public enjoyment of the waters and the propagation of fish, shellfish, and wildlife, pursuant to the provisions of chapter 90.48 RCW. As a part of this requirement:

- All surface waters are protected by numeric and narrative criteria, designated uses, and an anti-degradation policy.
- Based on the use designations, numeric and narrative criteria are assigned to a water body to protect the existing and designated uses.
- Where multiple criteria for the same water quality parameter are assigned to a water body to protect different uses, the most stringent criteria for each parameter is to be applied.

Surface waters of the State include lakes, rivers, ponds, streams, inland waters, saltwaters, wetlands, and all other surface waters and water courses within the jurisdiction of the state of Washington.
WAC 173-201A-200 through 173-201A-260 and 173-201A-600 through 173-201A-612 describe the designated water uses and criteria. These criteria were established based on existing and potential water uses. Consideration was also given to both natural water quality potential and its limitations. Compliance with the surface water quality standards requires compliance with chapter 173-201A WAC, water quality standards for surface water, chapter 173-204 WAC, Sediment management standards, and applicable federal rules.

State Environmental Policy Act WAC173-240
The WAC 173-240-050 requires a statement in all wastewater comprehensive plans regarding compliance with the State Environmental Policy Act (SEPA), if applicable. (SEPA documentation is included in Appendix A of this report.) In addition to the SEPA requirements for this Plan, certain projects in the Plan’s CIP (Chapter 7) may require a SEPA review as well. That determination will be made on a project by project basis. A common outcome of the SEPA process on City projects is a determination of non-significance (DNS). However, if a project will have a probable significant adverse environmental impact, an environmental impact statement (EIS) will be required.

Growth Management Act RCW 36.70A
The state legislature has determined that uncoordinated and unplanned growth, together with a lack of common goals expressing the public’s interest in the conservation and the wise use of lands, pose a threat to the environment, sustainable economic development, and the health, safety, and high quality of life enjoyed by the residents of Washington state. RCW 36.70A addresses this issue. The Skagit Countywide Planning Policies establish areas in which the county and cities work together to set out urban growth area (UGA) boundaries, policies for directing urban growth, and land use designations within urban and rural areas. The Anacortes Comprehensive Plan includes land use policies and designations that are consistent with the Countywide Planning Policies.

Accreditation of Environmental Laboratories WAC 173-50
The State of Washington Department of Ecology (Ecology) requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters). Ecology accredited the City’s WWTP laboratory for: ammonia, BOD, CBOD, dissolved oxygen, pH, TSS, and total residual chlorine.

Shoreline Management Act RCW 90.58
The Shoreline Management Act of 1971 (RCW 90.58) establishes a broad policy giving preference to shoreline uses that protect water quality and the natural environment, depend on proximity to the water, and preserve or enhance public access to the water. Shoreline Management Act jurisdiction extends to lakes or reservoirs of 20 acres or greater, streams with a mean annual flow of 20 cubic feet per second (CFS) or greater, marine waters, and an area inland 200 feet...
from the ordinary high water mark. Projects are reviewed by local governments according to state guidelines and a local Shoreline Master Program. Anacortes's wastewater treatment plant is located at 5th Street & "T" Avenue with the existing outfall located within the shoreline of Guemes Channel.

**Floodplain Development Permit**

The City of Anacortes participates in the National Flood Insurance Program which requires a review of projects (including wastewater facilities) in a mapped flood plain and imposes conditions to reduce potential flood damage from floodwater. Floodplain development permitting is incorporated in the building permit process.

**Hydraulic Project Approval WAC 220-110**

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

**On-Site Septic System Regulations WAC 246-272 RCW 43.20**

In some cases wastewater may be treated and disposed of on-site either by individual septic systems or community systems. On-site septic systems should be designed to meet the DOH design standards. Approval of the systems will be made either by the Skagit County Health Department for systems under 3,500 gallons per day, or DOH for systems less than 14,500 gallons per day but greater than 3,500 gallons per day, or Ecology for systems that are over 14,500 gallons per day in capacity. The State Board of Health statute that provides the authority for the DOH to adopt rules for sewage is found in RCW 43.20. It is the City's policy that all future development within the UGA connects to the sewer system instead of installing individual septic systems.

**Sewer Ordinances and Planning Policies**

The Anacortes Municipal Code Chapter 13 sets rules and regulations for the City's water and sewer systems. The sections of this code relevant to this Plan are as follows:

13.04 Sewer System
13.08 Additional Regulations and Charges
13.10 Storm and Sewer Surface Water Utility
13.12 Connection Charges
13.16 Direct Discharge
13.18 Elimination of Storm or Surface Drainage water from sewage system
13.40 Wastewater Collection and Treatment System
NPDES Permit Special Conditions

The City's wastewater NPDES permit contains thirteen special conditions related to the operation of the City's wastewater system. The full permit is included in Appendix B. A summary of those conditions is as follows:

**Special Condition S.1 (Discharge Limits)** requires that all discharges and activities authorized by the permit comply with the terms and conditions of the permit. The effluent limits are discussed in Chapter 4. S.1 also defines the mixing zone authorizations for the Chronic Mixing Zone and the Acute Mixing Zone.

**Special Condition S.2, (Monitoring Requirements)** establishes monitoring requirements. It establishes a monitoring schedule; sampling and analytical procedures; flow measurement, field measurement and continuous monitoring device requirements; laboratory accreditation requirements; and procedures for requesting a reduction in monitoring.

**Special Condition S.3, (Reporting and Recording Requirements)** establishes requirements for reporting; records retention; recording of results; violation reporting; and maintaining a copy of the permit.

**Special Condition S.4, (Facility Loading)** establishes permitted flows or waste loads for the WWTP. It also establishes requirements for maintaining adequate capacity; duty to mitigate; and notification of new or altered sources.

**Special Conditions S.5 (Operation and Maintenance)** requires the proper operation and regular maintenance of equipment, and the City of Anacortes take adequate safeguards so that it uses constructed facilities to their optimum potential in terms of pollutant capture and treatment. It contains requirements regarding operator certification; an operation and maintenance program; short term reduction of service; safeguards for electrical power failure; prevention of inflow; bypass procedures; and operation and maintenance manual.

**Special Conditions S.6 Pretreatment** requires the City to comply with the pretreatment regulations in 40 CFR Part 403 and any additional regulations that the Environmental Protection Agency may promulgate under Section 307(b) (pretreatment) and 308 (reporting) of the Federal Clean Water Act. Chapter 13 of the Anacortes Municipal Code also sets pretreatment standards.

**Special Conditions S.7 (Solid Waste)** requires the proper handling and disposal of solid waste material.

**Special Conditions S.8 (Application of Renewal)** contains requirements pertaining to the renewal of the NPDES permit.
Special Conditions S.9 (Combined Sewer Overflows (CSO)) establishes the City's CSO locations, establishes reporting requirements, requires the City to implement and document nine EPA minimum controls for CSOs and establishes requirements for controlled CSO outfalls.

Special Condition S.10 (Wet Weather Operation) authorizes CSO-related bypasses of the secondary treatment portion of the Anacortes WWTP when the instantaneous flow rate to the WWTP exceeds 7.8 MGD as a result of precipitation events.

Special Condition S.11 (Outfall Evaluation) establishes requirements for inspection and reporting of submerged portions of the WWTP outfall.

Special Condition S.12 (Acute Toxicity) establishes effluent limits for acute toxicity; requirements for compliance with the effluent limit for acute toxicity and testing for acute toxicity; requirements pertaining to response to noncompliance; and sampling and reporting.

Special Condition S.13 (Chronic Toxicity) establishes requirements for chronic toxicity sampling, testing, and reporting.
Chapter 4- Existing Wastewater Facilities

Introduction
This chapter presents a description of the existing sewer system within the City of Anacortes. The sewer system consists of a collection system, which includes manholes, gravity flow pipes, force mains, pump stations, and treatment, which is accomplished at the Anacortes Wastewater Treatment Plant (WWTP). Interlocal agreements with local jurisdictions are also discussed.

Sewer Basins
The service area for the City was broken into 37 sewer basins for this plan. The sewer basins are shown in Exhibit 4-1, and in Table 4-1. The basin boundaries were developed using local topography and existing facility locations and were delineated to apportion existing flows to various trunk sewers within the system.

Table 4-1

<table>
<thead>
<tr>
<th>Sewer Basins</th>
<th>Service Area (Acres)</th>
<th>Pipe Length (Miles)</th>
<th>Basin</th>
<th>Service Area (Acres)</th>
<th>Pipe Length (Miles)</th>
</tr>
</thead>
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<tr>
<td>A</td>
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<td>S1</td>
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<tr>
<td>P</td>
<td>18.7</td>
<td>1</td>
<td>V</td>
<td>29.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Q</td>
<td>42.3</td>
<td>1.2</td>
<td>W</td>
<td>523.8</td>
<td>8.4</td>
</tr>
<tr>
<td>R</td>
<td>15.1</td>
<td>0.7</td>
<td>X</td>
<td>4.6</td>
<td>0.1</td>
</tr>
<tr>
<td>S</td>
<td>216.8</td>
<td>6.4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of Basins: 37
Total Length: 106.2 Miles
Total Acres: 4333

City of Anacortes
Sanitary Sewer Plan 2015
Sewer Collection System

Gravity Sewers
The collection system currently consists of 106.2 miles of sewer ranging in size from 4-inches to 36-inches, Table 4-2 shows the breakdown of the sewer lines and Exhibit 4-2 shows the sewer system. There are three classifications of gravity sewer lines: trunk, interceptor, and lateral. The definition of each is provided in WAC 458-20-251, which pertains to the assessment of public utility taxes on sewage collection “businesses”.

Table 4-2
Sewer Line Information

<table>
<thead>
<tr>
<th>Pipe Size (inch)</th>
<th>Pipe Length (mile)</th>
<th>Pipe Type</th>
<th>Pipe Length (mile)</th>
<th>Pipe Classification</th>
<th>Pipe Length (mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1.5</td>
<td>Clay</td>
<td>2.6</td>
<td>Trunk</td>
<td>4.4</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Concrete</td>
<td>50.5</td>
<td>Interceptor</td>
<td>42.7</td>
</tr>
<tr>
<td>6</td>
<td>14.0</td>
<td>Ductile Iron</td>
<td>1.7</td>
<td>Lateral</td>
<td>49.1</td>
</tr>
<tr>
<td>8</td>
<td>70.7</td>
<td>HDPE</td>
<td>0.3</td>
<td>Force main</td>
<td>9.4</td>
</tr>
<tr>
<td>10</td>
<td>2.5</td>
<td>PVC</td>
<td>51.1</td>
<td>Outfall</td>
<td>0.6</td>
</tr>
<tr>
<td>12</td>
<td>9.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>0.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>0.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>2.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The condition of the wastewater collection system varies with age and specific circumstances. Table 4-3 shows the line sizes, types and age of all pipes in the current system.

### Table 4-3
Wastewater Collection System Piping Summary

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Lineal Feet</th>
<th>Pipe Type</th>
<th>Year Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5&quot;</td>
<td>371</td>
<td>FM</td>
<td>1979</td>
</tr>
<tr>
<td>2&quot;</td>
<td>644</td>
<td>PVC</td>
<td>1977</td>
</tr>
<tr>
<td>2.5&quot;</td>
<td>542</td>
<td>PVC</td>
<td>2008</td>
</tr>
<tr>
<td>4&quot;</td>
<td>1615</td>
<td>CONC</td>
<td>1958</td>
</tr>
<tr>
<td>4&quot;</td>
<td>6491</td>
<td>PVC</td>
<td>1977</td>
</tr>
<tr>
<td>5&quot;</td>
<td>5390</td>
<td>FM</td>
<td>2002</td>
</tr>
<tr>
<td>6&quot;</td>
<td>4287</td>
<td>CLAY</td>
<td>+70 years</td>
</tr>
<tr>
<td>6&quot;</td>
<td>23527</td>
<td>CONC</td>
<td>+40 years</td>
</tr>
<tr>
<td>6&quot;</td>
<td>46119</td>
<td>PVC</td>
<td>1977</td>
</tr>
<tr>
<td>8&quot;</td>
<td>5932</td>
<td>CLAY</td>
<td>+70 years</td>
</tr>
<tr>
<td>8&quot;</td>
<td>176418</td>
<td>CONC</td>
<td>+40 years</td>
</tr>
<tr>
<td>8&quot;</td>
<td>325</td>
<td>DI</td>
<td>2008</td>
</tr>
<tr>
<td>8&quot;</td>
<td>1466</td>
<td>HDPE</td>
<td>2008</td>
</tr>
<tr>
<td>8&quot;</td>
<td>187030</td>
<td>PVC</td>
<td>1979</td>
</tr>
<tr>
<td>10&quot;</td>
<td>2124</td>
<td>CLAY</td>
<td>+70 years</td>
</tr>
<tr>
<td>10&quot;</td>
<td>6644</td>
<td>CONC</td>
<td>+40 years</td>
</tr>
<tr>
<td>10&quot;</td>
<td>189</td>
<td>DI</td>
<td>2000</td>
</tr>
<tr>
<td>10&quot;</td>
<td>4056</td>
<td>PVC</td>
<td>2000</td>
</tr>
<tr>
<td>12&quot;</td>
<td>1198</td>
<td>CLAY</td>
<td>+70 years</td>
</tr>
<tr>
<td>12&quot;</td>
<td>24726</td>
<td>CONC</td>
<td>+40 years</td>
</tr>
<tr>
<td>12&quot;</td>
<td>24066</td>
<td>PVC</td>
<td>1980</td>
</tr>
<tr>
<td>15&quot;</td>
<td>274</td>
<td>CLAY</td>
<td>+70 years</td>
</tr>
<tr>
<td>15&quot;</td>
<td>8319</td>
<td>CONC</td>
<td>1950</td>
</tr>
<tr>
<td>15&quot;</td>
<td>1460</td>
<td>PVC</td>
<td>1991</td>
</tr>
<tr>
<td>18&quot;</td>
<td>4326</td>
<td>CONC</td>
<td>+70 years</td>
</tr>
<tr>
<td>18&quot;</td>
<td>98</td>
<td>HDPE</td>
<td>2011</td>
</tr>
<tr>
<td>18&quot;</td>
<td>387</td>
<td>PVC</td>
<td>1990</td>
</tr>
<tr>
<td>20&quot;</td>
<td>321</td>
<td>PVC</td>
<td>1990</td>
</tr>
<tr>
<td>21&quot;</td>
<td>4979</td>
<td>CONC</td>
<td>1969</td>
</tr>
<tr>
<td>24&quot;</td>
<td>12932</td>
<td>CONC</td>
<td>1970</td>
</tr>
<tr>
<td>24&quot;</td>
<td>685</td>
<td>PVC</td>
<td>1981</td>
</tr>
<tr>
<td>27&quot;</td>
<td>3055</td>
<td>CONC</td>
<td>1955</td>
</tr>
<tr>
<td>36&quot;</td>
<td>590</td>
<td>CONC</td>
<td>1955</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>560,586</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Force Mains and Lift Stations

The City employs the use of permanent lift stations when installation of a gravity system is not feasible. The City currently has 23 lift stations in service and 1 private pump station. Table 4-4 summarizes the lift stations characteristics and Exhibit 4-3 shows the lift station locations. Appendix D contains a pump station inventory.

**Table 4-4**

Lift Station Characteristics

<table>
<thead>
<tr>
<th>Lift Station #</th>
<th>Location</th>
<th>Year Built(rebuilt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3911 Mallard Pt.</td>
<td>2000</td>
</tr>
<tr>
<td>2</td>
<td>4105 Mitchell Dr.</td>
<td>1983</td>
</tr>
<tr>
<td>3</td>
<td>2322 11th St.</td>
<td>2000</td>
</tr>
<tr>
<td>4</td>
<td>2819 &quot;T&quot; Ave.</td>
<td>2001</td>
</tr>
<tr>
<td>5</td>
<td>1118 Edwards Way</td>
<td>2005</td>
</tr>
<tr>
<td>6</td>
<td>3009 &quot;B&quot; Ave.</td>
<td>2000</td>
</tr>
<tr>
<td>7</td>
<td>1411 &quot;I&quot; Ave.</td>
<td>1991</td>
</tr>
<tr>
<td>8</td>
<td>418 2nd St.</td>
<td>1997</td>
</tr>
<tr>
<td>9</td>
<td>416 2nd St.</td>
<td>1997</td>
</tr>
<tr>
<td>10</td>
<td>201 Curtis Dr.</td>
<td>1998</td>
</tr>
<tr>
<td>11</td>
<td>203 E. Park Dr.</td>
<td>1978</td>
</tr>
<tr>
<td>12</td>
<td>103 5th St.</td>
<td>2007</td>
</tr>
<tr>
<td>13</td>
<td>5918 Cabana Ln.</td>
<td>2010</td>
</tr>
<tr>
<td>14</td>
<td>2100 Ferry Terminal Rd.</td>
<td>1992</td>
</tr>
<tr>
<td>15</td>
<td>1200 &quot;B&quot; Ave.</td>
<td>2005</td>
</tr>
<tr>
<td>16</td>
<td>4533 Anaco Beach Rd.</td>
<td>2005</td>
</tr>
<tr>
<td>17</td>
<td>1517 &quot;R&quot; Ave.</td>
<td>2010</td>
</tr>
<tr>
<td>18</td>
<td>8071 S. March Pt Rd.</td>
<td>2004</td>
</tr>
<tr>
<td>19</td>
<td>12493 Barthalomew Rd.</td>
<td>Mothballed</td>
</tr>
<tr>
<td>20</td>
<td>9430 S. March Pt Rd.</td>
<td>2004</td>
</tr>
<tr>
<td>21</td>
<td>2708 FirCrest Blvd.</td>
<td>2005</td>
</tr>
<tr>
<td>22</td>
<td>1016 13th St.</td>
<td>2009</td>
</tr>
<tr>
<td>23</td>
<td>1915 13th St.</td>
<td>2009</td>
</tr>
</tbody>
</table>
City of Anacortes

Sanitary Sewer Plan 2015

41
The force mains or pressurized sewer lines associated with each lift station are shown in Exhibit 4-3. There are 9.4 miles of force main in the City. The force main pipe diameter ranges in size from 1.5 inch to 12 inch. The majority of the force mains are either ductile iron or PVC pipe. Table 4-5 provides an inventory of force mains. The City's existing pump station facilities are equipped with wet wells and submersible pumps to simplify operation and maintenance procedures. City wastewater maintenance personnel have refined their maintenance approach to provide simplified, reliable operation of these pump stations.

Table 4-5
Inventory of Force Mains

<table>
<thead>
<tr>
<th>Pump Station #</th>
<th>Length</th>
<th>Size</th>
<th>Material</th>
<th>Year Built</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>251</td>
<td>4</td>
<td>PVC</td>
<td>1976</td>
<td>easement Mallard to Terrace</td>
</tr>
<tr>
<td>2</td>
<td>110</td>
<td>4</td>
<td>PVC</td>
<td>1976</td>
<td>4105 Mitchell Dr. west to 4104</td>
</tr>
<tr>
<td>3</td>
<td>465</td>
<td>8</td>
<td>HDPE</td>
<td>1999</td>
<td>11th St B Ave to 12th St &amp; B Ave</td>
</tr>
<tr>
<td>4</td>
<td>169</td>
<td>8</td>
<td>CONC</td>
<td>3000</td>
<td>alley east of T Ave</td>
</tr>
<tr>
<td>5</td>
<td>1232</td>
<td>6</td>
<td>DI</td>
<td>2005</td>
<td>Edwards Way Pump Station to Oakes Ave. connect with 12FM</td>
</tr>
<tr>
<td>6</td>
<td>85</td>
<td>4</td>
<td>HDPE</td>
<td>3000</td>
<td>alley B Ave between 30th-31st St</td>
</tr>
<tr>
<td>7</td>
<td>288</td>
<td>4</td>
<td>PVC</td>
<td>1974</td>
<td>I Ave &amp; 14th St</td>
</tr>
<tr>
<td>8</td>
<td>256</td>
<td>1.5</td>
<td>PVC</td>
<td>1977</td>
<td>418 2nd St NW yard heading south to alley</td>
</tr>
<tr>
<td>9</td>
<td>115</td>
<td>1.5</td>
<td>PVC</td>
<td>1977</td>
<td>416 2nd St north yard heading SW</td>
</tr>
<tr>
<td>10</td>
<td>276</td>
<td>1.5</td>
<td>HDPE</td>
<td>1977</td>
<td>201 Curtis Dr. south to 3rd St</td>
</tr>
<tr>
<td>11</td>
<td>368</td>
<td>1.5</td>
<td>PVC</td>
<td>1977</td>
<td>201 East Park Dr. south then East to Curtis Dr.</td>
</tr>
<tr>
<td>12</td>
<td>980</td>
<td>6</td>
<td>PVC</td>
<td>2007</td>
<td>5th St east cul-de-sac heading west to 412</td>
</tr>
<tr>
<td>13</td>
<td>10248</td>
<td>12</td>
<td>DI</td>
<td>1990</td>
<td>Skyline Pump Station on Cabana Lane</td>
</tr>
<tr>
<td>14</td>
<td>3060</td>
<td>6</td>
<td>DI</td>
<td>1990</td>
<td>State Ferry Dock Pump Station south to Sunset Ave</td>
</tr>
<tr>
<td>15</td>
<td>2468</td>
<td>12</td>
<td>PVC</td>
<td>1990</td>
<td>B Ave Pump Station heading east</td>
</tr>
<tr>
<td>16</td>
<td>1286</td>
<td>4</td>
<td>PVC</td>
<td>1994</td>
<td>4533 Anaco Beach Rd. PS NW up to Bryce Dr.</td>
</tr>
<tr>
<td>17</td>
<td>813</td>
<td>4</td>
<td>PVC</td>
<td>2009</td>
<td>1601 Seafarers' Way PS</td>
</tr>
<tr>
<td>18</td>
<td>13735</td>
<td>6</td>
<td>HDPE</td>
<td>2000</td>
<td>S. March Pt. Rd. PS north to Fidalgo Bay Rd. off ramp</td>
</tr>
<tr>
<td>19</td>
<td>219</td>
<td>6</td>
<td>DI</td>
<td>2000</td>
<td>Bartholomew Rd. at S. March Pt Rd. heading north</td>
</tr>
<tr>
<td>20</td>
<td>5386</td>
<td>6</td>
<td>HDPE</td>
<td>2000</td>
<td>9420 S. March Pt Rd heading west</td>
</tr>
<tr>
<td>21</td>
<td>5390</td>
<td>5</td>
<td>HDPE</td>
<td>2002</td>
<td>9420 S. March Pt Rd heading west</td>
</tr>
<tr>
<td>22</td>
<td>653</td>
<td>4</td>
<td>HDPE</td>
<td>2003</td>
<td>2708 Fir Crest Blvd heading East</td>
</tr>
<tr>
<td>23</td>
<td>114</td>
<td>3</td>
<td>PVC</td>
<td>2009</td>
<td>Main Fire Station</td>
</tr>
<tr>
<td>24</td>
<td>542</td>
<td>2.5</td>
<td>PVC</td>
<td>2008</td>
<td>Bathrooms at Volunteer Park to 13th St.</td>
</tr>
<tr>
<td>RV-PRIV</td>
<td>2788</td>
<td>4</td>
<td>PVC</td>
<td>1994</td>
<td>4701 Fidalgo Bay Rd. heading north</td>
</tr>
</tbody>
</table>

City of Anacortes
Sanitary Sewer Plan 2015
Combined Sewer Overflows

The City of Anacortes has two combined sewer overflows (CSOs) (a third CSO has been decommissioned) which have the potential to discharge untreated wastewater and stormwater as a result of precipitation events. The City worked with the Washington State Department of Ecology (Ecology) in developing the 1990 CSO plan to monitor and provide sediment sampling downstream of the CSOs and to establish baseline CSO volumes and frequency. The City has permanent flow meters installed at each of the CSO structures to measure CSO activity. The flows are reported and discussed in the annual CSO reports as submitted to Ecology.

The CSOs are identified in the City's wastewater NPDES permit issued to the City wastewater plant by Ecology. Both outfalls are controlled CSOs that satisfy the Washington State requirement of "greatest reasonable reduction" by meeting the standard of not more than one discharge event per outfall per year on average. The City adopted a CSO Reduction Plan in 1990 and amended the plan in 2010. These plans document the efforts undertaken by the City to reduce and eliminate CSO events. The City successfully eliminated one CSO and controlled the other two to meet the state standard. A Post Construction Monitoring Plan (PCMP) describes monitoring protocols to verify the effectiveness of CSO controls, provides information for use in demonstrating compliance with State water quality standards, and provides protection of designated uses. A copy of the PCMP is included in Appendix E, as is a copy of a CSO reduction plan amendment dated July 2010 and a copy of the latest CSO report.

The B Avenue CSO is located at the northern end of B Avenue approximately 180 feet north of 11th Street. The wastewater in this basin flows north on B Avenue into manhole #U6-017 to the west of Pump Station No. 3, then east into the Pump Station No. 3 wet well. If the Pump Station No. 3 wet well backs up, the wastewater flow backs up the 8-inch sewer line to the B Avenue CSO manhole #U6-016. The overflow pipe is a 12-inch concrete line to the northwest out of the CSO that flows into Guemes Channel. The overflow pipe is separated from the wastewater flows through the manhole by a concrete overflow dam with a weir for flow measurement. The flow meter measures the levels and velocity of the overflow and transmits this data to the WWTP. A location map and photo showing the B Avenue CSO structure including the dam and overflow weir structure can be seen in Figure 3 CSO Reduction Plan Amendment.

The Q Avenue CSO is located at the intersection of 2nd Street and Commercial Avenue in manhole R-012. The overflow pipe is separated from the wastewater flows through the manhole by a concrete overflow dam. A float switch installed in this CSO structure monitors the flow and transmits this data to the WWTP. The overflow pipe from the manhole is a 24-inch concrete pipe flowing to the east. Approximately 20-feet east of the CSO structure is a manhole with a flow meter for flow measurement. The flow is measured with a magnetic flow meter and the flow passes through the meter. The flows continue to the east into the DCI ship building property and into manhole #R-009. The
flows turn north out of manhole #R-009 and through a 12-inch line flowing to Guemes Channel.

**Septic Systems**

All parts of the City can now be accessed by the sewer system. There are existing homes that were built in areas that previously were not served by City sewer and were allowed to utilize on-site treatment (septic) systems. There are 175 septic systems in the City. Exhibit 4-4 shows the known sites with septic systems in the city.

Septic systems can contribute to the recharge of shallow aquifers. Due to this it is important that septic users ensure that their systems are operating properly by providing adequate treatment of the effluent. The Washington State Department of Health (DOH) maintains the on-site septic system program for the State, according to WAC 246-272. DOH works with Skagit County to review design and installation, provide guidance for maintenance, and document septic system failures.

Typical septic system failures are caused by lack of proper maintenance, soils with poor drainage characteristics, or high groundwater levels. Indicators of failing septic systems include pooling of water on drain fields, slow draining fixtures in the homes, distinctive odors, and plumbing backups. Septic systems can also fail by not adequately treating the sewage before it percolates out of the drain field area and downward toward shallow groundwater.

Soils on Fidalgo Island are mainly Bow-Coveland-Swinomish soils. These soils are generally poor draining soils and adequate percolation may not occur. This results in the effluent moving laterally and draining offsite.

As such, the City’s policy is to not allow septic systems to be installed within the service area, except on an exceptional case basis, where no other feasible connection to the City’s sewer system can take place. In addition, existing homes on septic systems are encouraged to connect to the City sewer system where feasible.
City of Anacortes
Sanitary Sewer Plan 2015
Wastewater Treatment Plant

Not including bodies of water and the Anacortes Forest Lands which are not developable, Anacortes's wastewater utility serves over 4307 acres of residential and commercial customers within the City of Anacortes. The system is classified as a combined system, with two combined sewer overflows (CSO) in the system. The wastewater system is responsible for operating and maintaining 96.8 miles of gravity sewers, 23 pump stations, 9.4 miles of force mains ranging in size from 1.5 inch to 12 inches in diameter, and 175 septic tanks. The system collects and transports wastewater to the treatment plant at 5th St. & “T” Ave. in the NE corner of the city. Each pump station is set-up for emergency power generation.

The plant incorporates a plug flow conventional activated sludge design. Common wall construction techniques are being used for the primary clarifiers and aeration basins to conserve plant space. Most flow through the plant is by gravity. However, effluent flows must be pumped under high flow / high tide conditions. The frequency of effluent pumping required will increase as the plant approaches its design capacity. Effluent discharge from the plant is through a discharge line of varying diameter that conveys flows from the treatment plant to an existing outfall in Guemes Channel at “R” Avenue. The plant outfall was modified during construction of the secondary treatment plant. These modifications included replacement of the marine portion (with extension) and part of the land portion. The marine portion was placed on pilings and outfitted with diffuser ports to enhance effluent dilution in Guemes Channel. A schematic diagram of the liquid stream process is included in Exhibit 4-5.
Raw sewage is passed through a screening system with 3/8" openings. All solids greater than this size are removed and dewatered in a press. Dewatered screenings are deposited in a solid waste dumpster. Primary sludge and grit are comingled and pumped out of the primary clarifier, the sludge is de-gritted in cyclone separators, washed and dewatered and deposited in solid waste dumpsters. Raw primary and secondary waste activated sludge solids are pumped into gravity thickeners. After thickening the sludge solids are pumped to a belt filter press for dewatering. Dewatered sludge solids are pumped into a fluidized sand bed incinerator. Belt press filtrate is returned to the headworks for treatment. Ash is removed from the incinerator off gas stream, thickened in a gravity thickener, dewatered across a vacuum filter and deposited in municipal solid waste dumpsters. The ash is routinely tested to confirm that it does not meet Washington State hazardous or dangerous waste designations.

All of the residual solids; ash, grit and screenings are co-mingled with other municipal solid waste and hauled in to the Skagit County solid waste transfer station. All of the solid waste from the county is hauled to the Klickitat County Regional landfill.

**Existing System Capacity**
The original design criteria for wastewater treatment plant was as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Month Design Flow (MMDF)</td>
<td>3.2 MGD</td>
</tr>
<tr>
<td>BOD Influent Loading for Maximum Month</td>
<td>5,316 lbs/day</td>
</tr>
<tr>
<td>TSS Influent Loading for Maximum Month</td>
<td>5,674 lbs/day</td>
</tr>
</tbody>
</table>

In 1998, the City (work done by HDR Engineering, Inc) conducted a capacity analysis and determined that the actual capacity is greater than the original design criteria. Appendix F contains a copy of the report. The permitted design criteria is now as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Month Design Flow (MMDF)</td>
<td>4.5 MGD</td>
</tr>
<tr>
<td>BOD Influent Loading for Maximum Month</td>
<td>6,400 lbs/day</td>
</tr>
<tr>
<td>TSS Influent Loading for Maximum Month</td>
<td>6,400 lbs/day</td>
</tr>
</tbody>
</table>

This treatment plant capacity is generally consistent with the population projections, provided there is no significant increase in industrial wastes discharged to the plant and continued progress on I/I removal is achieved. Summer tourist wastewater loads will increase peak load to the facility. However quantification of this increase is difficult to estimate.

While the plant site, located on two entire city blocks, is physically constrained, the facility was designed with the capability for a 100 percent expansion. This expansion would involve the construction of additional primary and secondary clarifiers, aeration basins, and chlorine contact tanks. Disposal of waste sludge from the secondary City of Anacortes.

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wastewater treatment plant is accomplished on site at the plant sludge incinerator. The incinerator has a capacity of 600 pounds per hour of sludge, at 20 to 25 percent dry solids.

Capacity of major pump stations appears adequate to handle future build out within the city limits. In some cases pumps will have to be upgraded or replaced with larger units to handle future peak flows. However, the pump stations have been designed to handle these modifications.

**Interlocal Agreements with Neighboring Jurisdictions**

The City has three agreements with neighboring jurisdictions that affect the wastewater system. One agreement is with the Shelter Bay community regarding the City's *incineration of wastewater sludge from Shelter Bay's treatment facility*. Another is with the Port of Anacortes regarding the discharge of storm water and process water from the Port's Pier 2 to the City's wastewater treatment facility. The City also has an agreement with the City of Oak Harbor that addresses the sharing of personnel and equipment during emergencies. Copies of these agreements can be found in Appendix G.
Chapter 5- System Evaluation

Introduction

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

Definition of Terms

In this chapter, the existing wastewater characteristics for the City are analyzed and projections made for future conditions. The terms and abbreviations used in the analysis are described below.

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

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

**Infiltration** is groundwater entering a sewer system by means of defective pipes, pipe joints or manhole walls. Infiltration quantities exhibit seasonal variation in response to groundwater levels. Storm events or irrigation trigger a rise in groundwater levels and increase infiltration. The greatest infiltration is observed following significant storm events and prolonged periods of precipitation.

**Inflow** is surface water entering the sewer system from yard, roof, and footing drains; from cross connections with storm drains; and through holes in manhole covers. Peak inflow occurs during heavy storm events when storm sewer systems are taxed beyond their capacity, resulting in hydraulic backups and local ponding.

**Maximum Month Flow (MMF)** is the highest monthly flow during a calendar year. In western Washington, the maximum month flow occurs in the winter due to the presence of more I&I. This wintertime flow is composed of the normal domestic, commercial and
public use flows with significant contributions from inflow and infiltration. The predicted maximum month flow at the end of the design period is used as the design flow for sizing treatment processes and selecting treatment equipment.

Peak hour flow is the highest hourly flow during a calendar year. The peak flow in western Washington usually occurs in response to a significant storm event preceded by prolonged periods of rainfall, which have previously developed a high groundwater table in the service area. Peak hour flows are used in sizing the hydraulic capacity of wastewater collection, treatment, and pumping components. Peak hour flow is typically determined from treatment plant flow records and used to estimate future flows. In the Department of Ecology’s publication Criteria for Sewage Works Design (also known as the “Orange Book”) a method for estimating peak hourly flow is provided for new systems. This method is assumed to cover “normal” infiltration in a new system, which may be instructive when compared to actual conditions.

Biochemical Oxygen Demand (BOD) is a measure of the oxygen required by microorganisms in the biochemical oxidation (digestion) of organic matter. BOD is an indicator of the organic strength of the wastewater. If wastewater is discharged untreated to the environment, biodegradable organics will deplete natural oxygen resources and result in the development of septic (anaerobic) conditions. BOD data, together with other parameters, are used in the sizing of the treatment facilities and provide a measurement for determining the effectiveness of the treatment process. BOD is expressed as a concentration in terms of milligrams per liter (mg/L) and as a load in terms of pounds per day (lbs/d). The term BOD typically refers to a 5-day BOD, often written as BOD5, since the BOD test protocol requires five days for completion. BOD5 of a wastewater is composed of two components — carbonaceous oxygen demand (CBOD5), and nitrogenous oxygen demand (NBOD5). The use of CBOD5 as a parameter for evaluating wastewater strength removes the influence of nitrogenous components, including ammonia and organic nitrogen.

Suspended solids is the solid matter carried in the waste stream. Total Suspended Solids (TSS) is expressed in milligrams per liter (mg/L) for concentration and pounds per day (lbs/d) for mass load. The amount of TSS in the wastewater is used in sizing the treatment facilities and provides another measure of the treatment effectiveness. The concentration of TSS in wastewater affects the treatment facility biosolids production rate and treatment requirements.

Existing Wastewater Flows and Loading

WWTP records have been reviewed and analyzed to determine current wastewater characteristics and influent loading. Current wastewater flows and loadings are used in conjunction with projected population data to determine projected future wastewater flows and loadings. Table 5-1 summarizes WWTP influent flows for the period of January 2012 through April 2015. The reported monthly average influent flows ranged
from 1.36 MGD to 3.06 MGD with an average flow over the subject period of 2.02 MGD. The peak hourly flow, which occurred in January 2015, was 9.94 MGD.

Table 5-1
WWTP Influent Flows and Waste Strengths

<table>
<thead>
<tr>
<th>Summary Report Date</th>
<th>Anacortes Wastewater Plant Influent Peak Flow MGD</th>
<th>Anacortes Wastewater Plant Influent Total Solids TSS mg/L</th>
<th>Anacortes Wastewater Plant Influent BOD5 mg/L</th>
<th>Anacortes Wastewater Plant Influent Total Solids TSS LB</th>
<th>Anacortes Wastewater Plant Influent Total Solids TSS LB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-12</td>
<td>2.15</td>
<td>185</td>
<td>2918</td>
<td>197</td>
<td>3426</td>
</tr>
<tr>
<td>Feb-12</td>
<td>2.76</td>
<td>NA</td>
<td>3093</td>
<td>173</td>
<td>3530</td>
</tr>
<tr>
<td>Mar-12</td>
<td>2.38</td>
<td>NA</td>
<td>3110</td>
<td>175</td>
<td>3375</td>
</tr>
<tr>
<td>Apr-12</td>
<td>2.14</td>
<td>NA</td>
<td>3331</td>
<td>212</td>
<td>3790</td>
</tr>
<tr>
<td>May-12</td>
<td>1.69</td>
<td>NA</td>
<td>3104</td>
<td>271</td>
<td>3804</td>
</tr>
<tr>
<td>Jun-12</td>
<td>1.69</td>
<td>NA</td>
<td>3408</td>
<td>306</td>
<td>4300</td>
</tr>
<tr>
<td>Jul-12</td>
<td>1.67</td>
<td>NA</td>
<td>3391</td>
<td>332</td>
<td>4607</td>
</tr>
<tr>
<td>Aug-12</td>
<td>1.48</td>
<td>NA</td>
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<td>378</td>
<td>4074</td>
</tr>
<tr>
<td>Sep-12</td>
<td>1.36</td>
<td>NA</td>
<td>3058</td>
<td>337</td>
<td>3833</td>
</tr>
<tr>
<td>Oct-12</td>
<td>1.06</td>
<td>NA</td>
<td>3211</td>
<td>298</td>
<td>3899</td>
</tr>
<tr>
<td>Nov-12</td>
<td>2.37</td>
<td>NA</td>
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<td>199</td>
<td>3711</td>
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<td>Dec-12</td>
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<tr>
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<td>3138</td>
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<td>4256</td>
</tr>
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<td>3.39</td>
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<td>May-13</td>
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<td>3.12</td>
<td>2982</td>
<td>291</td>
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<tr>
<td>Jun-13</td>
<td>1.56</td>
<td>3.07</td>
<td>3315</td>
<td>347</td>
<td>4470</td>
</tr>
<tr>
<td>Jul-13</td>
<td>1.47</td>
<td>2.41</td>
<td>2817</td>
<td>364</td>
<td>4449</td>
</tr>
<tr>
<td>Aug-13</td>
<td>1.45</td>
<td>2.55</td>
<td>3492</td>
<td>376</td>
<td>4589</td>
</tr>
<tr>
<td>Sep-13</td>
<td>1.55</td>
<td>4.51</td>
<td>2991</td>
<td>332</td>
<td>4232</td>
</tr>
<tr>
<td>Oct-13</td>
<td>1.47</td>
<td>2.71</td>
<td>2984</td>
<td>306</td>
<td>3755</td>
</tr>
<tr>
<td>Nov-13</td>
<td>1.83</td>
<td>5.26</td>
<td>2881</td>
<td>273</td>
<td>4025</td>
</tr>
<tr>
<td>Dec-13</td>
<td>2.11</td>
<td>5.37</td>
<td>3085</td>
<td>254</td>
<td>4387</td>
</tr>
<tr>
<td>Jan-14</td>
<td>2.61</td>
<td>7.07</td>
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<td>213</td>
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</tr>
<tr>
<td>Feb-14</td>
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<td>7.87</td>
<td>2926</td>
<td>200</td>
<td>4078</td>
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<tr>
<td>Mar-14</td>
<td>2.87</td>
<td>7.53</td>
<td>3273</td>
<td>192</td>
<td>4314</td>
</tr>
<tr>
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<td>4.35</td>
<td>3436</td>
<td>274</td>
<td>4425</td>
</tr>
<tr>
<td>May-14</td>
<td>2.08</td>
<td>4.73</td>
<td>3216</td>
<td>249</td>
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</tr>
<tr>
<td>Jun-14</td>
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<td>3099</td>
<td>334</td>
<td>4318</td>
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<td>Jul-14</td>
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<td>3122</td>
<td>344</td>
<td>4281</td>
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<td>Aug-14</td>
<td>1.49</td>
<td>3.21</td>
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<td>Sep-13</td>
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<td>3.55</td>
<td>3130</td>
<td>335</td>
<td>4178</td>
</tr>
<tr>
<td>Oct-14</td>
<td>1.76</td>
<td>4.89</td>
<td>2971</td>
<td>267</td>
<td>3793</td>
</tr>
<tr>
<td>Nov-14</td>
<td>2.21</td>
<td>7.17</td>
<td>2990</td>
<td>224</td>
<td>3857</td>
</tr>
<tr>
<td>Dec-14</td>
<td>2.45</td>
<td>5.78</td>
<td>3232</td>
<td>221</td>
<td>4419</td>
</tr>
<tr>
<td>Jan-15</td>
<td>3.05</td>
<td>9.94</td>
<td>3404</td>
<td>181</td>
<td>4553</td>
</tr>
<tr>
<td>Feb-15</td>
<td>2.33</td>
<td>5.12</td>
<td>3557</td>
<td>213</td>
<td>4089</td>
</tr>
<tr>
<td>Mar-15</td>
<td>2.08</td>
<td>5.33</td>
<td>3310</td>
<td>243</td>
<td>4152</td>
</tr>
<tr>
<td>Apr-15</td>
<td>1.71</td>
<td>4.21</td>
<td>3537</td>
<td>305</td>
<td>4325</td>
</tr>
<tr>
<td>Sum</td>
<td>80.69</td>
<td>8263</td>
<td>127451</td>
<td>10636</td>
<td>165398</td>
</tr>
<tr>
<td>Avg</td>
<td>2.02</td>
<td>208</td>
<td>3186</td>
<td>266</td>
<td>4134</td>
</tr>
<tr>
<td>Min</td>
<td>3.06</td>
<td>9.94</td>
<td>3717</td>
<td>379</td>
<td>4674</td>
</tr>
<tr>
<td>Max</td>
<td>1.36</td>
<td>110</td>
<td>2731</td>
<td>765</td>
<td>3373</td>
</tr>
</tbody>
</table>
The maximum monthly influent BOD\textsubscript{5} loading shown in Table 5-1 is 3717 lb/d for August 2012. Using this value as the maximum month condition, with an estimated population of 16398, yields a BOD\textsubscript{5} loading of 0.227 lbs/c/d.

The maximum monthly influent TSS loading shown in Table 5-1 is 4674 lb/d in August 2012. Using this value as the maximum month condition, with an estimated population of 16398, yields a TSS loading 0.285 lbs/c/d.

The annual average and maximum month unit loadings to the WWTP are summarized in Table 5-2.

<table>
<thead>
<tr>
<th></th>
<th>BOD (lbs/capita/day)</th>
<th>TSS (lbs/capita/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Historical Unit Loading 2012-2014</td>
<td>Unit Load for Build-Out</td>
</tr>
<tr>
<td>Average Annual</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td>Maximum Month</td>
<td>0.23</td>
<td>0.23</td>
</tr>
</tbody>
</table>

### Projected Flows and Loadings

#### Wastewater Plant

An evaluation of the existing wastewater treatment plant’s ability to accommodate anticipated growth over 20 year planning period was completed. The first step included a review of existing flows and loads to the plant, which are shown in Table 5-1 for an approximate 3 year period. Projected flows were then developed for 2036 build-out conditions. The three permitted (City of Anacortes Wastewater NPDES Permit) design criteria are Maximum Month Flow (MMF), BOD Influent Loading for Maximum Month, and TSS Influent Loading for Maximum Month.

Flows reaching the plant are effected by the high levels of infiltration and inflow (I&I) the existing sewer system is subject to. Much of the existing collection system is made up of concrete and clay pipe with a great deal of infiltration through cracked or broken pipe, bad pipe joints, or manholes that are in bad condition or that were poorly constructed. Known sources of inflow include roof drains, area drains, foundation drains, sump pumps, and some parking lots, that are directly connected to the sewer system.

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Sanitary Sewer Plan 2015
The ratio of the peak hour flow to the average day flow is known as the peaking factor. For typical wastewater collection systems, peaking factors can range from as low as 1.5 to as high as 4.0. Peaking factors are typically a function of the quantity of flow; for larger service areas with larger flows, the peaks are attenuated resulting in a smaller peaking factor. With a typical separate sewer system serving a city the size of Anacortes with a population of 16,398, the predicted peaking factor is 2.7 (Reference Table C1-1 of the DOE Criteria for Sewage Works Design). The actual peaking factor for the City of Anacortes is at least 4.9. This assumes a peak hour flow of 9.94 MGD which is essentially the hydraulic capacity of the plant (the plant cannot physically pump more than approximately 9.94 MGD into the headworks). The actual peak flow is likely higher than that, and so the peaking factor is likely higher as well.

Future flows and loads were developed for 2036 build-out conditions within the city limits. The present loads include domestic, commercial, and some industrial processing water. The existing population served was assumed to be 16,398. A 20 year population growth of 5,895 was assumed with a total population of 22,293 at 2036. A forecasted employment growth of 2076 additional employees by year 2036 was also used (Sources: BERK Consulting 2014; Skagit Council of Governments 2014). Future unit loadings were developed to estimate flows at this build-out condition.

To evaluate the impacts of population growth, existing WWTP data for the years 2012, 2013, and 2014 were analyzed. Regarding flow, on a monthly per capita basis, flows ranged from an average of 126 gpcd to a low of 85 gpcd. The assumed populations were 15,960 for 2012, 16,080 for 2013, and 16,190 for 2014 with an average of 16,076 for those three years. (Source: Office of Financial Management). Future build-out within the system will consist of separate sewers with much lower levels of I&I. Projected flows were based on 85 gpcd (192 ERU/2.25 persons per household) average day conditions and 110 gpcd for maximum month conditions.

Also for population growth, per capita loadings were used to predict additional BOD and TSS loading. Existing WWTP data were evaluated for per capita BOD and TSS and is summarized in Table 5-2. The historical per capita loading for TSS was higher than typical design standards. It was decided to use a typical design standard for Maximum Month of 0.23 gpcd for both BOD and TSS.

For future employment growth, it was assumed that there would an additional 35 gallons per day per employee of flow (does not include process flow) and 0.07 lbs/day per person of BOD and TSS (Source: DOE Criteria for Sewage Works Design, Table G2-2 for factories).

The existing and projected flows and loadings for 2036 build-out conditions are summarized in Table 5-3.
Table 5-3
Existing and Projected Loading to WWTP

<table>
<thead>
<tr>
<th></th>
<th>Plant Capacity</th>
<th>Existing Service Area</th>
<th>Population Added</th>
<th>Employee Added</th>
<th>Total 2036 Build Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow (MGD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average-Day</td>
<td></td>
<td></td>
<td>2.02</td>
<td>0.5</td>
<td>0.04</td>
</tr>
<tr>
<td>Maximum-Month</td>
<td>4.5</td>
<td></td>
<td>3.06</td>
<td>0.65</td>
<td>0.07</td>
</tr>
<tr>
<td>Peak Hour</td>
<td>9.94</td>
<td></td>
<td>9.94</td>
<td>1.35</td>
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<td>BOD (lbs/day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Maximum-Month</td>
<td>6400</td>
<td></td>
<td>3717</td>
<td>1356</td>
<td>145</td>
</tr>
<tr>
<td>TSS (lbs/day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum-Month</td>
<td>6400</td>
<td></td>
<td>4674</td>
<td>1356</td>
<td>145</td>
</tr>
</tbody>
</table>

Evaluation of Existing Plant Capacity

The projected loads developed above were compared with the actual design capacity of the existing treatment plant. The three potentially limiting parameters reviewed included biochemical oxygen demand (BOD), solids loadings (TSS), and influent flow. The BOD and TSS loadings are related to biological processes and related limiting conditions are typically maximum month (lbs/day) loadings. The Maximum Month Flow (MMF), measured in million gallon per day (MGD), is used as the design flow for sizing treatment processes.

The City's wastewater NPDES permit provides a maximum month design loading for BOD of 6400 lbs/day. Current maximum month loading is at 57 percent of plant capacity. Projected maximum month loading at build-out is at 80 percent of plant capacity.

The NPDES permit provides a maximum month design solids loading for TSS of 6400 lbs/day. Current maximum month loading is presently at 73 percent of plant capacity. Projected maximum month solids loading at build-out is at 96 percent of design maximum month. TSS levels are currently higher than would be expected. The reason for this is not well understood at this time. This is something that will need to be monitored as growth occurs.

City of Anacortes

Sanitary Sewer Plan 2015
The plant has adequate capacity to treat influent BOD and TSS loads for build-out conditions.

The analysis demonstrates based on the projected flows that the plant has adequate capacity to treat wastewater influent associated with the 2036 build-out population, including a "normal", or typical amount of inflow and infiltration. Anacortes, however, has a higher rate of inflow and infiltration (I&I) than would be expected for a City the size of Anacortes. If nothing was done to address this I&I problem, the hydraulic capacity will be exceeded for peak hour flow conditions at build-out. In fact, there have already been occurrences when flows to the plant exceeded the hydraulic capacity of the plant. There have been eight occasions since 2003 where this exceedance of plant hydraulic capacity has resulted in an overflow of the collection system resulting in untreated sewage entering Fidalgo Bay.

Two of the last three events were directly attributable to equipment failure and likely would not have occurred in the absence of these failures. An overflow which happened on January 5, 2015, was directly influenced by the failure of a stormwater pump station owned and operated by another jurisdiction. That failure caused hundreds of thousands of gallons of stormwater to flow directly into the City's sanitary sewer collection system through damaged sanitary sewer manholes. Those manholes have since been repaired and made watertight. And on November 17, 2015, a failure of variable frequency drives (VFDs) at the plant's effluent pump station caused treated wastewater to be reintroduced to the plant's headworks, thereby greatly reducing the plant's outflow at a time when the inflow was increasing. Those VFDs have since been repaired.

The latest event, which occurred subsequent to the original draft of this Plan, occurred on February 15, 2016. There are no known equipment failure associated with this latest event which overflowed an estimated 500,000 gallons of wastewater. If the previous two events had not occurred, this is the first I&I caused overflow to occur since 2011.

These exceedances of the WWTP hydraulic capacity are not caused by inadequacies of the WWTP, and so, the best solution does not lie at the WWTP. The problem is caused by a high inflow and infiltration problem due, primarily, to leaky pipes and manholes that result in too much infiltration.

There are two alternatives available to correct this problem. The first is to eliminate the high levels of inflow and infiltration within the system. This would require an increase in the City's I&I reduction program. Since overflow events occur infrequently, another alternative is to provide storage for these peak flows. The preferred method of storage would likely be an "in-line" storage system which employs oversized pipes within the collection system to provide the required storage volume, which is likely to be on the order of 500,000 gallons, based on the latest overflow event.

The recommended alternative is to increase the City's inflow and infiltration program. With this alternative, not only is the peak flow issue being addressed, but the overall City of Anacortes

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condition of the collection system is being improved, pumping costs are reduced, and the overall burden on the treatment plant is being reduced as well. The storage option would not help solve the root problem which is a collection system in poor condition, and, in fact, would take resources away from that effort.

In recent years, the City has been increasing its I&I reduction efforts. The Capital Improvement Plan presented in Chapter 7 recommends increasing the annual budget for inflow and infiltration reduction to $1,000,000 by the year 2020. This represents a significant increase in the program. This amount is based on the rehabilitation of the portion of the collection system that is clay and concrete pipe, which is about half the system, over a 20-year period. The Capital Improvement Plan also recommends the addition of two full-time employees dedicated to collection system maintenance, primarily pipe cleaning and inspection.

The City currently takes a basin by basin approach to reducing I&I. In general, the approach is to correct deficiencies within a selected project basin before moving on to the next basin. Within a project basin, sewer lines are inspected via television and are smoke tested to identify sources of inflow and infiltration. This approach was followed in the recent rehabilitation of the “L” district, completed in 2013 which is believed to have removed a significant amount of storm drainage from the wastewater collection system and also removed an abandoned CSO outfall that is believed to have been tidally influenced, allowing seawater to flow backwards into the collection system under certain tide conditions.

The City has conducted studies in the past regarding I&I reduction, and could conduct another evaluation where flows are monitored during wet weather conditions and drainage basins with the highest levels of I&I are identified. That approach is not being taken at this time. It is felt that any reduction in I&I, regardless of location, helps reduce the problem. Rather than spending resources on study, the approach has been to select project basins based on knowledge of the system and judgement, taking into account basins known to have high levels of I&I because of pump station records, for example, and/or the maintenance history indicates a problem. This Plan recommends the addition of two full time employees for collection system maintenance which is primarily cleaning and inspection. This increase in inspection efforts will provide additional information that will be useful in deciding where the City should spend its resources. Moving forward, the City should confirm the effectiveness of its I&I reduction effort by evaluating before and after flow for the project basin.

Evaluation of Existing Collection System

Within Current City Limits

Not including bodies of water and the Anacortes Forest Lands which are not developable, Anacortes’s wastewater utility serves over 4307 acres of residential and City of Anacortes

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commercial customers within the City of Anacortes. The system is classified as a combined sewer system, with the presence of stormwater in wastewater system and two active Combined Sewer Overflows (CSOs). The City is working to remove stormwater from the wastewater system where feasible and no new stormwater connections to the wastewater system are allowed. The wastewater system consists of gravity sewers, pump stations, force mains and septic tanks and the wastewater treatment plant. There are a number of single-family homes located in the southeast of the service area that are served by individual on-site septic systems, which are not maintained by the City.

A large portion of the original wastewater collection system was constructed and brought on-line in the late 1960s. The system has grown incrementally since that time as additional development occurred and wastewater facilities were constructed. The system experienced substantial growth in the later part of the 1990s, and is presently experiencing growth as well.

The system collects and transports wastewater to the treatment plant at 5th St. & "T" Avenue in the northeast corner of the city. The wastewater utility is responsible for operating and maintaining approximately 106 miles of gravity and force main piping sized from 1.5-inch through 36 inches in diameter, as well as 23 conventional lift stations. All pump stations are set-up for emergency power generation.

The City has a well-developed collection system that serves the majority of the land area within the city limits. Within the current city limits, there are no large undeveloped land areas that do not have sewer available to them. Even with the high levels of inflow and infiltration the collection system experiences, there are no known collection system components with deficient capacity under current conditions.

Consideration was given to whether the City’s system should be modeled. The Department of Ecology’s Criteria for Sewage Works Design provides the following caveat: "The decision process for using modeling must realistically weigh the potential benefits of the model against the costs associated with gathering necessary information and constructing the model". In this case, the City concluded that the benefits of having a model do not outweigh the costs associated with developing a model, both in terms of time and money, and so, the decision was made to not model the system at this time. It was concluded that the long term flow monitoring that would need to be completed with the development of the model would cause too long of a delay in completing the Plan. Most of the City already has sewer service. A model could be useful in indicating if the existing sewers have adequate capacity both in current conditions and at build-out. However, this is not necessary to adequately accommodate growth. There are no known capacity issues with the collection system under current conditions. This is true even with the high levels of inflow and infiltration the system experiences. A reduction in inflow and infiltration within the collection system will cause a corresponding increase the capacity available for new flow caused by growth. In the future, the selection of project basins for inflow and infiltration reduction will need to

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consider areas that may experience significant growth, so that the capacity of the existing collection system can be increased with the reduction of inflow and infiltration.

**Outside Current City Limits**

In 2008, the City completed a plan for the extension of sewer service into the Urban Growth Area (UGA) located at the eastern extent of the Anacortes city limits. This *Padilla Heights Sanitary Sewer Plan and Cost Estimate* is located in Appendix H. The plan includes conceptual design and planning using estimated sewer loads and current zoning.

This UGA referred to consists of two separate areas totaling 187 acres. The first is generally made up of the properties adjacent to Padilla Heights Road, consisting of approximately 162 acres, and bordered by SR20 to the north and Reservation Road to the west, as shown in 5-1. The second portion of UGA is an area of approximately 25 acres sited between Stevenson Road to the north, and Similk Bay Road to the south. Projects associated with serving these areas are included in the Chapter 7 Capital Improvement Plan.
Sea Level Rise

Since the time of the Last Glacial Maximum about 20,000 years ago, sea level has been on the rise at varying rates. Over the last century, sea level rose globally by 19 cm.\(^8\) The rate of increase in sea level appears to have doubled in the last 20 years. Global warming is thought to cause the two main mechanisms contributing to sea level rise: (1) thermal expansion (ocean water expands as it warms); and (2) melting stores of ice sheets and glaciers.\(^9\) Local application of global projections of sea level rise are complicated by multiple factors such as atmospheric circulation patterns and vertical land movement (tectonics).\(^10\) Taking into account these variables, the National Research Council has made projections of anticipated sea level rise for California, Oregon, and Washington.\(^11\) For the coast of Washington the projected rise is 2-inches by 2030, with a range of -2-inches (sea level fall) to 8-inches; and 6-inches by 2050, with a range of 4-inches to approximately 19-inches. The 2030 projections are used for this study period analysis.

To evaluate extreme high tide levels that are currently anticipated, graphs provided by the National Oceanic and Atmospheric Administration (NOAA) that compare 10% and 1% exceedance probability levels, which correspond to sea levels that would be exceeded ten times and one time per century, for selected stations throughout the United States were consulted.\(^12\) (A 10-year exceedance probability level can be thought of as the extreme sea level that has the probability of occurring on a ten year interval and a 100 year exceedance probability level as the extreme sea level that has the probability of occurring on a 100 year interval). Exceedance probabilities are based on a statistical analysis of historic values. Extreme levels are a combination of the astronomical tide, storm surge, and limited wave setup caused by breaking waves. NOAA tide projections for Anacortes are based on the Port Townsend tide gauge corrected for Anacortes (Anacortes experiences high tides that are 96% of Port Townsend high tides.) NOAA exceedance probabilities are given for 10 year and 100 year events in terms of meters above Mean Higher High Water (MHHW) elevations. For Anacortes, MHHW is 8.2 feet. For Port Townsend (and therefore Anacortes) the 10-year exceedance level is 0.86 meters (2.8 feet) and the 100-year exceedance level is 0.96 meters (3.2 feet.) As a reference, the highest tide on record for Anacortes was 11.3 feet in December 1982. In order to estimate possible extreme sea levels in this Plan's study period, Table 5-4 shows the sum of the MHHW elevation, exceedance levels, and the projected sea level rise values (that is, the current estimated extreme high tides plus anticipated rise in sea level).

\(^{8}\) Geophysical Research Letters, Recent global sea level acceleration started over 200 years ago?
\(^{9}\) Intergovernmental Panel on Climate Change (IPCC), FAQ 5.1: Is Sea Level Rising?
\(^{10}\) Skagit Climate Science Consortium, Sea Level Rise
\(^{11}\) National Research Council Committee on Sea-Level Rise, Sea-Level Rise for the Coasts of California, Oregon, and Washington; Past, Present, Future
\(^{12}\) NOAA Website, Extreme Water Levels

City of Anacortes
The effect of high sea levels were considered for three major components of the wastewater system: the wastewater treatment plant (WWTP), the collection system, and the CSOs.

**Wastewater Treatment Plant**

There are two potential concerns associated with the WWTP that might result from an extreme high sea level. One is the possibility of sea water intrusion into the storm drainage system that surrounds the plant. Storm water from the WWTP site drains into, and is treated by, the WWTP. If sea level reached catch basins in the system, the plant could be overwhelmed. The lowest catch basin grate elevation is 14.86 feet. With a worst case sea level elevation of 12.1 feet, this system is not in danger.

The second danger to the WWTP would be if sea level reached an elevation high enough where it caused flooding of below-grade rooms at the plant, causing damage to WWTP components and ultimately causing a complete shutdown of the plant. Walkway elevations at the plant are approximately 15.8 feet and door thresholds elevations are approximately 16.8 feet. Again, with a worst case sea level elevation of 12.1 feet, the plant is not in danger.

**Collection system**

There are two potential concerns associated with the collection system that could result from extreme high sea level. One is the overtopping of manholes which would cause a large volume of inflow into the collection system potentially causing pump stations and/or the WWTP to be overwhelmed. The other concern is the potential for a higher sea level to cause a rise in groundwater elevations and, therefore, exasperating the City’s inflow and infiltration (I/I) problem.

Sanitary sewer manholes in low lying areas were examined to determine if any are located below the projected extreme sea levels. Two areas were discovered that could be impacted. There are as many as 10 to 15 manholes located on Cabana Lane and City of Anacortes.

---

### TABLE 5-4
ESTIMATED MAXIMUM SEA LEVELS

<table>
<thead>
<tr>
<th>2030 Sea Level Rise Projection</th>
<th>Maximum Water Level with 10 year Exceedance Probability</th>
<th>Maximum Water Level with 100 year Exceedance Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 Feet (Predicted)</td>
<td>11.2 feet ( (8.2 + 2.8 + 0.2) )</td>
<td>11.6 feet ( (8.2 + 3.2 + 0.2) )</td>
</tr>
<tr>
<td>0.7 Feet (Range Maximum)</td>
<td>11.7 feet ( (8.2 + 2.8 + 0.7) )</td>
<td>12.1 feet ( (8.2 + 3.2 + 0.7) )</td>
</tr>
</tbody>
</table>
Flounder Bay Lane with rim elevations at approximately 11.5 feet. Those manholes are probably safe in the near term. If the 100 year extreme tide were to occur and manholes were submerged, pump station 13 could be overwhelmed. In that case, the WWTP would receive an alarm and staff would then go out and place sandbags on the lids of the manholes causing the problem. Over the long term, these low lying manholes should be fitted with watertight lids under the I&I reduction program.

There are also manholes on the gravity sewer line on the north end of the Swinomish golf course located near Christianson Road and Highway 20, and on Christianson Road, that have rim elevations in the range of 6 to 10 feet. These manholes are currently protected by a ground and stormwater pumping system operated by Skagit County. In an extreme tide event, it is not likely this pumping system could prevent flooding of this area. This is a problem area that has been recognized in the past and, as a result, a project was completed under the City's I&I reduction program that raised rim elevations on some manholes and outfitted others with water tight lids. However, not all manholes in the area are protected in this way and it is recommended that the remaining manholes in this area be made watertight under the I&I reduction program.

Rising sea levels will cause a corresponding increase in the ground water table at elevations that are tidally influenced. Since the sanitary sewer collection system piping is located significantly below grade, in many low elevation areas the sewer pipes are at depths that the ground water table is tidally influenced. Rising sea levels will apply additional pressure to hold up the level of the ground water. Increasing sea level may cause an increase in the amount of infiltration into the sanitary sewer collection system. The problem would be reduced or resolved with an adequate I&I reduction program.

**Combined Sewer Overflows (CSO)**

The sanitary sewer collection system is equipped with a combined sewer overflow (CSO) located at 2nd Street and Commercial Avenue. In large storm events the sanitary sewer collection system becomes overwhelmed with extraneous water from inflow and infiltration. The CSO provides some hydraulic relief by diverting some of the water in the collection system directly out into the Guemes Channel. This is preferable to overwhelming the collection system and having raw sewage spill out of manholes and run down streets and/or into the storm drain system. The impacts the projected extreme sea level might have on the function of the CSO were considered. The CSO outfall is equipped with a "duckbill" valve that prevents sea water from flowing backwards into the outfall so the gravity system is protected. However, the increase in sea level will reduce the elevation difference between the sewage in the collection system (CSO) manhole and the level of the sea, which could reduce the capacity the CSO. The CSO manhole rim elevation is at 13.5'. During an extreme event where sea level rises to an elevation of 12.1 feet, the CSO will still function, but less hydraulic pressure (reduced head) will be available to force flow out the CSO outfall. The best solution to this problem is to reduce inflow and infiltration, which is what causes the need for the CSO, so that demand to release sewage through the CSO is correspondingly reduced.
In conclusion, the City's wastewater system is not at risk in the near term to effects of sea level rise per se, and no capital improvement projects are required to deal with sea level rise within this 20-year planning period. However, there is already some risk to the system associated with potential extreme tides that should be addressed through the City's I&I reduction program, including making vulnerable manholes watertight and continuing to improve the condition of the collection system.
Chapter 6- Operation and Maintenance

Introduction

This chapter addresses the operation and maintenance of the components in the City's sewer system. The system includes pump stations, generators, force mains, and gravity pipelines, as well as the various components of the Wastewater Treatment Plant. The sections of this chapter include responsibility and authority, normal system operation, O&M costs, routine and preventative maintenance criteria, as well as current and future staffing needs.

There are two primary objectives of this chapter. The first objective is to provide documentation of satisfactory wastewater system management operations in accordance with WAC 173-230. This objective includes a description of the staff organization, existing facilities and their normal operation. The second objective is to provide an evaluation of staffing needs.

Responsibility and Authority

The city is governed by a mayor and seven council members. The Public Works Director reports directly to the Mayor and oversees the management of the Public Works Department, including the sewer system. The organization chart for the Public Works Department is shown in Exhibit 6-1. There are currently a total of 65 FTEs on the Public Works staff. Department responsibilities include the water system, streets, storm sewers, sanitation, fleet, facilities, the wastewater treatment plant, and the sewer collection system.

The Street Maintenance Crew is responsible for the maintenance and operation of the gravity sewer system, which includes routine maintenance functions such as pipe cleaning as well as video inspection. The crew is also responsible for repairs to the gravity system. The crew consists of nine members including the Street Maintenance Supervisor, who reports to the Operations Manager. Other tasks such as utility locates are shared with water system maintenance.

In addition to the running of the wastewater plant (WWTP), the WWTP staff are responsible for the maintenance and operation of the City's wastewater pump stations and force mains. There are 13 WWTP staff members including 3 supervisors, who report to the WWTP Manager.
The Washington State Department of Ecology, under WAC 173-230, requires every operator in charge of a wastewater treatment plant to be certified at a level equal to or higher than the classification rating of the facility. Under condition S5 of the City's wastewater NPDES permit, an operator certified for at least a Class III Plant shall be in responsible charge of the day-to-day operations and an operator certified for a Class II Plant shall be in charge during all regularly scheduled shifts.

There are currently no Washington State certification requirements for wastewater collection system operators. However, the Department of Ecology encourages participation in a program for collection system certification.

Table 6-1 summarizes the certification of staff as of July 2015.

### Table 6-1
2015 Personnel Certification

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Certification Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebecca Fox</td>
<td>WWTP - Plant Manager</td>
<td>Group III</td>
</tr>
<tr>
<td>Steve Doebler</td>
<td>WWTP - Maintenance Supervisor</td>
<td>Group III</td>
</tr>
<tr>
<td>Robert Hendrix</td>
<td>WWTP - Operations Supervisor</td>
<td>Group III, Incinerator Certified</td>
</tr>
<tr>
<td>Harry Whyte</td>
<td>WWTP - Laboratory Supervisor</td>
<td>Group III, Incinerator Certified</td>
</tr>
<tr>
<td>Alan Bower</td>
<td>WWTP Operator</td>
<td>Group III, Incinerator Certified</td>
</tr>
<tr>
<td>Wayne Davis</td>
<td>WWTP Operator</td>
<td>Group III, Incinerator Certified</td>
</tr>
<tr>
<td>Odilon Flores Jr.</td>
<td>WWTP Operator</td>
<td>Group IV, Incinerator Certified</td>
</tr>
<tr>
<td>Mark Gatto</td>
<td>WWTP Operator</td>
<td>Group IV, Incinerator Certified</td>
</tr>
<tr>
<td>Ven Johnson</td>
<td>WWTP Operator</td>
<td>Group III, Incinerator Certified</td>
</tr>
<tr>
<td>Allen Lindbo</td>
<td>WWTP Operator</td>
<td>Group III, Incinerator Certified</td>
</tr>
<tr>
<td>Adam Veal</td>
<td>WWTP Operator</td>
<td>Group II, Incinerator Certified</td>
</tr>
<tr>
<td>Katy Wynn</td>
<td>WWTP Operator</td>
<td>Group III, Incinerator Certified</td>
</tr>
<tr>
<td>Lou Zurcher</td>
<td>WWTP Operator</td>
<td>Group III, Incinerator Certified</td>
</tr>
</tbody>
</table>

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Normal System Operation

The existing system of pump stations, force mains, and gravity lines is summarized in Tables 4-1, 4-2, 4-3, and 4-4 with additional pump station details included in Appendix D.

The City's wastewater collection system currently consists of 23 sewage pump stations, approximately 9.4 miles of force main, 96.8 miles of gravity sewer pipe. There are currently 6966 service connections in the system. Detailed operating instructions for wastewater treatment plant components, as well as pump stations components, are provided in Operation and Maintenance (O&M) manuals which are in electronic format (eO&M). The manuals have been compiled from manufacturer's information and are on file at the wastewater plant.

Operation and Maintenance Costs

Operation and Maintenance (O&M) costs associated with the wastewater system are split between the treatment plant, which includes the operation and maintenance of the plant as well as pump stations and force mains, and the operations street crew, who are responsible for the maintenance of the gravity system, including gravity pipes and manholes.

Treatment plant/pump station costs include administration, pumping expenses, sewage treatment, laboratory expenses, and solids handling expenses. Actual expenditures in 2014, which was a typical year, were $2,414,595.05.

Gravity sewer costs include administration and maintenance (e.g. pipe inspection and cleaning) expenses. Actual expenditures in 2014 were $290,383.69.

There is no debt service associated with the wastewater system.

Table 6-2
2014 O&M Cost per Service

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost Per Mile of Pipe</th>
<th>Cost Per Service Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Treatment Plant O&amp;M</td>
<td>$22,736.30</td>
<td>$346.63</td>
</tr>
<tr>
<td>Annual Gravity Sewer O&amp;M</td>
<td>$2,734.31</td>
<td>$41.69</td>
</tr>
<tr>
<td>Total</td>
<td>$25,470.61</td>
<td>$388.32</td>
</tr>
</tbody>
</table>

There are no new facilities planned that will significantly change operating, maintenance, or debt service costs within the planning horizon. Projected O&M and debt service costs per connection, therefore, are not expected to change significantly.

City of Anacortes
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Routine and Preventative Maintenance Criteria

The wastewater treatment plant manages equipment maintenance with a computerized maintenance management program named Antero. The software package allows the maintenance supervisor to schedule preventative maintenance, print work orders, track employee labor and dollars spent. Maintenance tasks can be scheduled on any repeating frequency (e.g. monthly, semi-annually, and biennially). Corrective maintenance is also entered into the data base permitting management access to the full cost of maintaining plant and pump station equipment.

On a scheduled basis, usually monthly, the maintenance supervisor prints out work orders and assigns the work to maintenance staff. The work order describes the work to be done, the number of people required and the tools that are needed. The work crew completes the job, fills out the work order and makes suggestions for improvement or recommendations for additional information that should be on the work order.

Tasks that are scheduled for time periods shorter than a month are usually tracked on a separate system, typically recorded on rounds sheets. An example of this type of maintenance task would be draining condensate traps or checking grease cups.

The primary tasks associated with the operation and maintenance of the wastewater collection system include inspection of pump stations and generators, televising and cleaning gravity sewer lines, and manhole inspection. Staffing and equipment requirements vary greatly with age, size, and type of system. The City's current maintenance schedule is shown in Table 6-3.
## Table 6-3
Preventative Maintenance Schedule

<table>
<thead>
<tr>
<th>Component</th>
<th>Visitation Schedule</th>
<th>Maintenance Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telemetry</td>
<td>Daily</td>
<td>• System Checked Daily</td>
</tr>
</tbody>
</table>
| Gravity Sewer and Manholes | On an as needed basis | • Pipelines cleaned
• Video inspected as required
• Lines identified as potential problem areas are maintained on a 6-month or more frequent basis
• Manholes inspected |
| Force Mains                | As necessary        | • As necessary
• Pump station pumping rate (gpm) is monitored by the SCADA system
When gpm drops to 80% of the normal rate, the plant staff doses the line with caustic to remove the slime growth |
| Pump Stations              | Quarterly           | • Inspected quarterly
• Service Station; lubricate locks, exercise valves
• Alarms Tested
• Pumps pulled for oil checks |
|                            | Annually            |                                                                                       |
| Generators                 | Weekly              | • Exercised automatically on a weekly basis by auto switch gear
• Fuel storage tanks are refilled twice annually at a minimum
• Annual Services by equipment rental
• Load Tests annually by outside contractor |
|                            | Annually            |                                                                                       |
Pump Station and Generator Maintenance

Table 6-4, covers maintenance items for the City's larger wet well/dry well pump stations.

<table>
<thead>
<tr>
<th>Item</th>
<th>Continuously</th>
<th>Weekly</th>
<th>Quarterly</th>
<th>Annually</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump Stations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCADA System</td>
<td></td>
<td></td>
<td>Check pump station operation</td>
<td>Pull Pumps for inspection and oil checks</td>
</tr>
<tr>
<td>• monitors and trends pump</td>
<td></td>
<td></td>
<td>• Clean floats</td>
<td>• Test Alarms</td>
</tr>
<tr>
<td>station activities</td>
<td></td>
<td></td>
<td>• Test all controls</td>
<td>• Verify pump station communication alarms</td>
</tr>
<tr>
<td>• Alarm system will notify plant</td>
<td></td>
<td></td>
<td>• Inspect Vaults</td>
<td></td>
</tr>
<tr>
<td>or on call operator of pump</td>
<td></td>
<td></td>
<td>• Clean grounds</td>
<td></td>
</tr>
<tr>
<td>long on time or high wet well level</td>
<td></td>
<td></td>
<td>• Check generators</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Check battery fluid level</td>
<td></td>
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<tr>
<td><strong>Pump Station Generators</strong></td>
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<td></td>
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<tr>
<td>• Generator coolant level,</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>fuel level, RPM and</td>
<td></td>
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<tr>
<td>condition are monitored by</td>
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<tr>
<td>the generator control system</td>
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<tr>
<td>that reports to SCADA</td>
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<tr>
<td>system for status checks and</td>
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<tr>
<td>alarming.</td>
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<tr>
<td><strong>Pump Station check by Equipment</strong></td>
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<td></td>
</tr>
<tr>
<td>Rental (Generators)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Check Oil</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>• Check Oil Filter</td>
<td></td>
<td></td>
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<tr>
<td>• Check battery terminals for</td>
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<tr>
<td>corrosion</td>
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<tr>
<td>• Check alternator output volts</td>
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</tr>
<tr>
<td>• Check fan belts</td>
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</tbody>
</table>
Gravity Sewers and Manholes

The major maintenance activities with respect to gravity sewers and manholes are periodic inspection and flushing. The older portions of the City's sewer collection system should be given special attention because the potential for breaks in sewer lines or accumulated solids in these areas. For the City of Anacortes, the older sewers are located in the neighborhood areas of Downtown, Old Town area which is north of 12th Street and Cap Sante. In addition, sewers with minimum grade will require more frequent cleaning.

Pipeline Cleaning

Periodic cleaning of the sewer collection system will ensure that sewers remain clear of blockages and free of odors. Root intrusion, grease, and deposited solids are the most common cleaning problems. Root intrusion develop through deteriorated joints or broken pipe. Over time, roots cause restrictions in the pipeline, which may cause system backups. Grease buildup in a pipe results from waste oils from commercial and residential food preparation. Grease floats to the surface and coats the inside of the pipe. Repeated coatings harden over time and may constrict the pipe diameter to a fraction of its original size. Deposit of solids result from low flow pipelines or low pipeline velocities. To maintain minimum scouring in pipelines, a velocity greater than 2-feet per second is required. However, because of minimum slope, low flow, and misaligned joints, this minimum velocity is not always achieved and solid material has an opportunity to deposit in the pipe channel. There are several methods available for pipeline cleaning: hydraulic, mechanical, and chemical. Each one is described below.

Hydraulic Cleaning

Hydraulic cleaning refers to any application of water to clean the pipe. Typically, the hydraulic unit is either trailer or truck mounted and has various sizes of water tanks and different types of power drives. A water pump delivers water through a nozzle at a high pressure and volume moving most materials in a pipe. The newest development in high velocity cleaning is the addition of vacuum systems to form a combination cleaner. This system employs the same cleaning techniques as high velocity cleaners but also use a vacuum to remove material from the pipe. A positive displacement or air pump is used to generate the vacuum.

Mechanical Cleaning

Power rodding equipment is utilized to remove blockages in sewer pipelines such as those caused by root intrusion or grease accumulations. The rod, which is stored on a reel, is fed into the line and turned automatically. Rodding machines can be trailer or truck mounted and are available with various engine sizes and a wide array of rod diameters and lengths. Rodders are often used in conjunction with high velocity hydraulic cleaners to first remove debris. Then, the rodder is used to remove the blockage. For follow-up action, the high velocity cleaner should be used periodically to City of Anacortes.
prevent future buildup and blockages. The location of all blockages should be mapped and used for the cleaning program.

**Chemical Cleaning**

Chemical treatment can be used for root and grease control. Chemical products such as copper sulfate and sodium hydroxide may kill roots with repeated applications but do not necessarily inhibit regrowth. Typically, roots would first be removed by mechanical means and then herbicides applied to prevent regrowth. Herbicides can inhibit growth for two to seven years. Chemical additives are also available for grease control. Agents such as bacterial cultures, enzymes, hydroxides, caustics, bioacids, and neutralizers are available to help control severe grease buildups but require regular application.

Chemical applications for root and grease control are recommended only as a last resort. These applications may negatively impact the operation of the treatment plant or simply transfer a problem to a downstream location. However, in limited access or high-traffic areas where set-up of cleaning or rodding machinery may be difficult, chemicals may be the viable solution.

**Video Inspection**

Inspection by closed circuit television is the most effective method of determining the nature and extent of internal problems in the sewer collection. The video inspection can locate misaligned joints, broken and cracked pipe, pipeline intrusions, and other structural defects. Particularly where older pipe is in service, a record of structural defects is required for establishing a pipeline rehabilitation program. When structural defects are found, replacement or rehabilitation is required. If the pipeline contains deteriorated joints but is otherwise in good condition, trenchless means for pipeline rehabilitation are available. The current range of inspection is almost unlimited. Small cameras can inspect even 4-inch service laterals. Also as with rodding equipment, video inspection equipment is often utilized with hydraulic cleaning. Video inspection equipment will not operate well in pipelines with debris and gravel accumulation.

**Cleaning and Inspection Standards**

There is no well-established industry standard for cleaning and inspection intervals. The Environmental Protection Agency reports in document EPA 832-F-99-031 that the average frequency of pipe cleaning is 29.9% of systems per year and of pipe TV inspection is 6.8% of systems per year.

Cleaning is performed more often than inspection because it addresses the accumulation of debris which can cause hydraulic disruptions in a short period of time. Inspection, on the other hand, identifies deteriorated or damaged structures due to corrosion, root penetration, or soil shifting which occur at a relatively slow, albeit consistent rate. TV inspection is also more time consuming than pipe cleaning. The
recommended system goals for Anacortes are 33 percent per year for cleaning and 10 percent per year for video inspection.

Typical rates of inspection and cleaning vary from 12 to 97, and 29 to 932 feet per hour. Table 6-5 estimates the staffing requirements for the current system at the system goal frequency stated above. The table uses an inspection and cleaning rate for a 2 person crew of 50 and 250 feet per hour, respectively, as the basis for the calculations.

Table 6-5
Staffing Requirements for Inspection and Cleaning

<table>
<thead>
<tr>
<th></th>
<th>Length of Gravity Pipe (mi)</th>
<th>Target Interval (yrs)</th>
<th>Length per year (ft)</th>
<th>Rate per Crew (ft/hr)</th>
<th>Required Number of Crew Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Inspection</td>
<td>96.8</td>
<td>10</td>
<td>51,000</td>
<td>50</td>
<td>1022</td>
</tr>
<tr>
<td>Pipeline Cleaning</td>
<td>96.8</td>
<td>3</td>
<td>170,000</td>
<td>250</td>
<td>681</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1703 hrs/yr (3406 crew hrs/yr)</td>
</tr>
</tbody>
</table>

Characterization of staffing often refers to full-time employees (FTEs). One FTE is defined as the equivalent labor force of one person working full time for one year. One employee may work a maximum of 2080 hours per year. However, due to vacation days and other time off such as holidays and sick leave and training, the hours worked by one FTE is less than 2080 hours per year. For this analysis, it is assumed that the actual hours worked per FTE is 1768 hours per year. The total hours shown in Table 6-5 are crew hours for a two person crew. Since there are 2 FTEs per crew, the total hours needed is 3406 hours/yr. The total additional FTEs required to adequately maintain the City's collection system is, therefore, 1.9 FTE.

Current Staffing Needs

The Operations street crew is responsible for the operations and maintenance of the gravity sewer system. The street crew has many duties and responsibilities and, as a result, does not have adequate staff to do video inspection or pipe cleaning other than on an as-needed basis. As shown in Table 6-5, in order to increase the video inspection and routine pipe cleaning to a level that is typical of other cities, staffing levels on the street crew would need to be increased by 2 FTE.
Future Staffing Needs

There are no significant areas of the City that do not have sanitary sewer available. Population growth will likely be accommodated by in-filling vacant parcels within the current city limits and increased density. The sewer system is not expected to expand significantly. No additional staff is expected to be needed to continue current activities as the population grows. However, to add activities that are not currently being accomplished, such as routine cleaning and inspection of the collection system, additional staff will be required.
Chapter 7- Capital Improvement Plan

Introduction

This Chapter presents a 6-year Capital Improvement Plan (CIP) in accordance with the requirements of WAC 173-240, as well as a 20-year CIP. Wastewater system capital improvements have been scheduled and prioritized on the basis of growth, regulatory requirements, component reliability, system benefit, and cost.

Location maps for the collection system and wastewater treatment plant CIP improvements are presented on Figure 7-1. For each capital improvement project, project descriptions and preliminary project cost estimates are provided. Each project cost estimate includes design and engineering, construction with a 20 percent contingency, 8.6 percent state sales tax, and construction management.

Project scopes and timing of each recommended improvement is provided for budgeting and financial projections purposes only. The actual design parameters should be evaluated at the design phase of the project, using accepted engineering procedures. Updated population and flow data should be used when available to ensure that the proposed facilities are adequately sized to handle build-out conditions.

One of the sources of information in this CIP is the City’s Capital Facility Plan (CFP), which is a document maintained by the City’s Finance Department and is used to project and track potential capital project needs. Each department in the City, including Public Works and the wastewater system, projects their capital needs in a 6-year window and contributes their department’s anticipated project’s scope, schedule, and budget to the CFP. The CFP is updated on a biannual basis.

The City’s wastewater CIP projects are shown in Table 7-1. This CIP anticipates increasing the annual budget for inflow and infiltration (I/I) reduction to $1,000,000 in the year 2020. The collection system has approximately 280,000 feet of concrete and clay pipe, which is about half the pipe in the system. The other half is primarily PVC pipe. Concrete and clay pipe are of older construction and are of greater concern both in terms of sources of I/I and overall condition and should be the focus of the I/I reduction effort. There are several alternative methods of pipe repair and rehabilitation available, ranging from cured-in-place (CIPP) technologies and pipe bursting up to complete pipe replacement. Per foot costs range from approximately $50 per foot for CIPP in ideal conditions, to as much as $300 per foot for pipe replacement in adverse conditions. To rehabilitate the 280,000 feet of concrete and clay pipe over a 20-year period, using an average rehabilitation cost of $75 per foot, the City would need to spend approximately $1,000,000 annually.

City of Anacortes

Sanitary Sewer Plan 2015
The selection of the rehabilitation method is situational and is made on a case by case basis, depending on such things as pipe condition, size, alignment, and/or grade. This estimated need of $1,000,000 per year is based on limited knowledge of the condition of the system. If the City initiates a routine cleaning and inspection effort, it will be in a much better position to estimate the need in the coming years.

Future projects that are not included as part of the City’s CIP presented in this chapter may become necessary. Such projects may be required in order to remedy an emergency situation, to address unforeseen problems, or to accommodate development. Due to budgetary constraints, the completion of such projects may require modifications to the recommended CIP. The City retains the flexibility to reschedule, expand, or reduce the projects included in the CIP and to add new projects to the CIP as new information becomes available for review and analysis.
### Table 7-1

#### Capital Improvements Plan

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<tr>
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</thead>
<tbody>
<tr>
<td><strong>Sanitary Sewer Collection System</strong></td>
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<td></td>
</tr>
<tr>
<td>Collection System Maintenance/Inflow and Infiltration Reduction</td>
<td>$200,000.00</td>
<td>$218,000.00</td>
<td>$237,000.00</td>
<td>$259,000.00</td>
<td>$300,000.00</td>
<td>$388,000.00</td>
<td>$22,874,000.00</td>
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</tr>
<tr>
<td>Pump Station Upgrades</td>
<td>$300,000.00</td>
<td>$305,000.00</td>
<td>$226,000.00</td>
<td>$225,000.00</td>
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<td>$238,000.00</td>
<td>$18,130,000.00</td>
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<tr>
<td>Pump Station #5 Removal</td>
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<tr>
<td>E Avenue Sewer Extension (at 41st)</td>
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<tr>
<td>Cap Sante Sewer Extension (7th Street &amp; W Avenue)</td>
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<tr>
<td>Pasillas Heights Road Sewer Extention</td>
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<tr>
<td>Reservation Road/Similk Bay Road Sewer Extention</td>
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<tr>
<td>Additional Collection System Inspection and Maintenance (Chapter 6)</td>
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<td>$216,000.00</td>
<td>$212,000.00</td>
<td>$219,000.00</td>
<td>$223,000.00</td>
<td>$232,000.00</td>
<td>$18,130,000.00</td>
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<td><strong>Total Sanitary Sewer Collection System</strong></td>
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<td>$1,133,000.00</td>
<td>$1,167,000.00</td>
<td>$1,203,000.00</td>
<td>$1,456,000.00</td>
<td>$1,500,000.00</td>
<td>$32,143,000.00</td>
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<tr>
<td><strong>WWTP Improvements</strong></td>
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<td></td>
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<tr>
<td>Incinerator Offgas Scrubbing System</td>
<td></td>
<td></td>
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<tr>
<td>Septage Handling Facility Upgrade</td>
<td></td>
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<tr>
<td>Replace Bar Screens and upgrade grit handling system</td>
<td></td>
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<tr>
<td>Outfall Maintenance and Rehabilitation</td>
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<td></td>
<td></td>
<td>$275,000.00</td>
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<tr>
<td>Influent Pumping Upgrade</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>$210,000.00</td>
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<tr>
<td>Dechlorination/Disinfection Upgrade</td>
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<td>$100,000.00</td>
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<tr>
<td>Effluent Pump Station Upgrade</td>
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<td></td>
<td>$150,000.00</td>
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<tr>
<td>Nutrient Removal Upgrade</td>
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<td>$100,000.00</td>
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<tr>
<td>Outlet Planum and Crossover Duct Rehabilitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>$300,000.00</td>
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<tr>
<td>Basin Rehabilitation</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>$340,000.00</td>
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<td>WWTP Equipment Replacement</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>$5,280,000.00</td>
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<tr>
<td><strong>Total WWTP Improvements</strong></td>
<td>$1,375,000.00</td>
<td>$1,433,000.00</td>
<td>$1,507,000.00</td>
<td>$1,563,000.00</td>
<td>$2,386,000.00</td>
<td>$2,560,000.00</td>
<td>$9,645,000.00</td>
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#### Total Sanitary Sewer 20 Year CIP Costs

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<tr>
<td></td>
<td>$2,475,000.00</td>
<td>$1,483,000.00</td>
<td>$1,507,000.00</td>
<td>$1,563,000.00</td>
<td>$2,386,000.00</td>
<td>$2,560,000.00</td>
<td>$37,423,000.00</td>
<td>$40,347,000.00</td>
</tr>
</tbody>
</table>
Projects

**Existing Sanitary Sewer Collection System**

**SS 1 – Collection System Maintenance and Rehabilitation**

The City budgets an annual amount (currently $300,000) to repair or replace deteriorating components of the sewer collection system, with the primary focus being the gravity system.

**SS 2 – Inflow and Infiltration Reduction**

The City budgets an annual amount (currently $300,000) to take measures to reduce inflow and infiltration, such as repairing or replacing leaky pipe and/or manholes.

*Note*: Subsequent to the initial drafting of this chapter, SS 1 and SS 2 were combined as shown in Table 7-1. The primary focus of this effort is intended to be I&I reduction and the recommended budget has been increased to $1,000,000 by year 2020.

Estimate Project Cost: $1,000,000 annually

**SS 3 – Pump Station Upgrades**

The City owns and operates 23 pump stations. It is anticipated that any particular pump station will need work, such as pump, piping, or controls upgrades, on an approximate 20-year rotation. Therefore, the City budgets an annual amount (currently $400,000) for such work. The current state of the pump stations is such that the recommended budget is reduced to $218,000 by 2018.

Estimate Project Cost: $218,000 annually

**SS 4 – Pump Station #6 Removal**

Make pipe and manhole modifications required to provide a gravity sewer allowing the removal of Pump Station #6.

Estimate Project Cost: $200,000
Collection System Additions

SC 1 – E Avenue Sewer Extension

This project will provide gravity sewer in the vicinity of 41st Street, a part of town currently served by on-site systems. The project includes running gravity pipe on E Avenue (south of 41st Street) to 41st Street.

Estimate Project Cost: $400,000

SC 2 – Cap Sante Sewer Extension

This project will provide gravity sewer to approximately 9 homes on Cap Sante that are currently served by on-site systems. The project includes gravity pipe between 5th Street/V Avenue and 7th Street/W Avenue.

Estimate Project Cost: $296,000

SC 3 – Padilla Heights Road Sewer Extension

This project will serve parcels east of Reservation Road between SR 20 and the potential future city limits to the south. The project includes a new pump station near the intersection of Padilla Heights Road and SR20; a gravity sewer line beginning at the crest of Padilla Heights Road and running east to the new pump station; a force main running back up the hill parallel to the gravity line; and a gravity line running north on Padilla Heights Road, then west to Reservation Road, connecting with an existing manhole on Reservation Road.

Estimate Project Cost: $3,163,000

SC 4 – Reservation Road/Similk Bay Road

This project will serve parcels adjacent to Reservation Road between Stevenson Road and Similk Bay Road, as well as properties adjacent to Similk Bay Road. The project includes a new pump station near the intersection of Similk Bay Road and Reservation Road and a force main on Reservation Road from the new pump station to an existing gravity sewer near Padilla Heights Road; gravity pipe on Reservation Road, from Stevenson Road to the new pump station; and gravity pipe on Similk Bay Road to the new pump station.

Estimate Project Cost: $1,683,000
(SC 3 and SC 4 are discussed in detail in the Padilla Heights Sanitary Sewer Plan and Cost Estimate (June 2008) – Appendix H)

Wastewater Treatment Plant

**WWTP 1 – Incinerator Off gas Scrubbing System**

To comply with new federal regulations, install a new incinerator off gas scrubbing system which will reduce the emission of certain constituents from the incinerator off gasses including mercury and sulfur oxides.

*Estimate Project Cost* $1,000,000

**WWTP 2 – Septage Handling Facility Upgrade (WWTP)**

Install new valves and actuators on inlets and outlets of both septage handling tanks, replace control panels and fully automate the operation of the septage handling facility.

*Estimate Project Cost* $80,000

**WWTP 3 – Replace Sewage Mechanical Bar Screens (WWTP)**

Remove existing mechanical bar screens and replace with new screens and equipment that meet current requirement for disposal in a sanitary landfill. New equipment will grind and wash screenings.

*Estimate Project Cost* $960,000

**WWTP 4 – Outfall Maintenance and Rehabilitation (WWTP)**

Replace approximately 150 feet of deteriorated outfall diffuser concrete pipe to connect the existing slip-lined 18-inch HDPE pipe with the existing 24-inch HDPE outfall diffuser.

*Estimate Project Cost* $275,000

**WWTP 5 – Influent Pumping Upgrades**

Re-grout both influent pump channels, channel and coat the influent pump inlet chambers, sandblast and coat the interior of the influent pump room. Replace the explosion proof lights and conduit system. Install a level sensor in the influent pump channel to monitor the capacity in the collection system.

*Estimate Project Cost* $210,000
**WWTP 6 – Dechlorination/Disinfection Upgrade**

The existing chemical feed pumps are obsolete and parts are no longer available. Replace all of the obsolete pumps with new peristaltic pumps.

Estimate Project Cost $100,000

**WWTP 7 – Effluent Pumping Upgrades**

Upgrade effluent pump station to increase pumping capacity during high flow events. Upgrade the electrical service to the pumps, upsize the pumps, and improve the control system.

Estimate Project Cost $1,000,000

**WWTP 8 – Nutrient Removal Upgrade**

Upgrade the plant to meet new effluent nutrient limits.

Estimate Project Cost $100,000

**WWTP 9 – Outlet Plenum and Crossover Duct Rehabilitation**

Replace the incinerator exhaust gas outlet plenum and crossover duct.

Estimated Project Cost $300,000

**WWTP 10 – WWTP Basin Rehabilitation**

Sandblast and coat the interior of basins to protect the concrete structures from further erosion. Coat the primary clarifiers, gravity thickeners, chlorine contact chambers, and secondary clarifiers.

Estimated Project Cost $350,000

**WWTP 11 – Incinerator Preheat Unit**

Completely rebuilt the incinerator preheat burner.

Estimated Project Cost $250,000
WWTP 12 – WWTP Equipment Replacement

This provides an annual budget for undefined equipment upgrade or replace beyond what can be foreseen.

Estimate Project Cost $300,000 annually after 2021
Chapter 8- Financing Plan

Introduction

This Chapter reviews the financial status of current wastewater system operations and the rates and charges used to fund the maintenance, replacement, and construction of new facilities as recommended in this Plan.

Wastewater Rates and Charges

Table 8-1 summarizes wastewater rates and Table 8-2 lists existing GFCs. Currently, wastewater rates are billed monthly and include uniform rates for residential, multifamily, and commercial customers. All customers are charged a minimum base rate plus the volume charge for their given strength class. Standard industrial code (SIC) is used to determine a customer's strength class, and residents are automatically classified as SIC 1.

<table>
<thead>
<tr>
<th>Table 8-1</th>
<th>Monthly Rates</th>
</tr>
</thead>
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<td>Base Charges</td>
<td>Duplexes Are Double The Base Charge</td>
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<tr>
<td>Meter Size</td>
<td>Base Charge</td>
</tr>
<tr>
<td>5/8&quot; x 3/4&quot;</td>
<td>31.61</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>37.94</td>
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<td>91.70</td>
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<tr>
<td>3&quot;</td>
<td>347.81</td>
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<td>4&quot;</td>
<td>442.67</td>
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</table>

Commodity (consumption) Charge per 100 CF

<table>
<thead>
<tr>
<th>Classification</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sic 1</td>
<td>2.25</td>
</tr>
<tr>
<td>Sic 2</td>
<td>2.81</td>
</tr>
<tr>
<td>Sic 3</td>
<td>5.47</td>
</tr>
<tr>
<td>Sic 4</td>
<td>0.89</td>
</tr>
<tr>
<td>SIC 4: BOD per Pound</td>
<td>1.18</td>
</tr>
<tr>
<td>SIC 4: TSS per Pound</td>
<td>0.72</td>
</tr>
</tbody>
</table>
Sewer charges are based on water consumption, by assuming that most water that comes into a home leaves the home through the City sanitary sewer system. During the warmer months, many homes have increased water usage that is not expelled through the sewer, mostly due to yard watering. In order to allow for the increase in water use without the increased burden on sewer, the City of Anacortes sets a “cap” on sewer charges for residential and single metered duplex accounts. This cap is based on the average winter water use (AWWU), taking the average consumption between November 1 and March 1. Adjustments due to leaks or misreads during the averaging period are factored in. The cap is then applied to the account for the next 12 months, beginning in April. There are 5 AWWU categories as shown here:

AWWU #1 Less than 600 cf/mo use, cap is 600 cf.
AWWU #2 600 to 800 cf/mo use, cap is 800 cf.
AWWU #3 801 to 1,000 cf/mo use, cap is 1,000 cf.
AWWU #4 1,001 to 1,500 cf/mo use, cap is 1,500 cf.
AWWU #5 1,501 cf or more used, there is no cap.

The wastewater utility also utilizes a capital charge for new customers connecting to the wastewater system known as a general facility charge or connection charge. General facility charges (GFCs) are intended to ensure a new customer pays a pro/rata share of both existing facilities from which they will benefit and a share of the cost of planned facilities. Revenues from GFCs are used to minimize the impact on monthly rates to provide new capital facilities required to serve growth. Table 8-2 lists existing GFCs.

<table>
<thead>
<tr>
<th>GFC</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential &amp; Commercial</td>
<td>$ 8,828.48</td>
</tr>
<tr>
<td>Wet Industrial Commercial</td>
<td>Based on Formula</td>
</tr>
</tbody>
</table>

In addition to the rates shown in Table 8-1 and 8-2, the City has elected to increase rates yearly, every January, based on two cost indices. For base and consumption rates, the Seattle-Tacoma-Bremerton—All Urban Wage Earners (CPI-U) is used, up to a maximum of 2% per year, to offset increases in expenses from price inflation. For GFC rates, the engineering news record (ENR) construction cost index is used to increase rates, not subject to the above mentioned 2% cap. Current City code specifies these automatic rate adjustments; however, the City will be updating this code and as with the other utilities, remove the 2% cap on base and consumption rate CPI increases.
Financial Status of the Existing System

The City operates a sewer utility fund which accounts for all revenues and expenses related to the sewer utility. Further, the City utilizes a detailed schedule of revenues and expenses that have been summarized for presentation purposes.

Historical Operating Cash Flows

Table 8-3 presents a summary of historical revenues and expenses associated with the wastewater system. These numbers represent cash flows from operating activities and do not include significant capital improvement costs. Positive operating cash flows indicate the ability of existing revenue sources to fund ongoing operations. Any remaining leftover operating revenue is available to fund capital construction, additional debt obligations, or to build capital reserves.

Table 8-3
Historical Wastewater Revenues and Expenses

<table>
<thead>
<tr>
<th>Operating Cash Flows</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015*</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+) General</td>
<td>$4,225,384</td>
<td>$4,416,866</td>
<td>$5,504,807</td>
<td>$5,034,959</td>
</tr>
<tr>
<td>Revenues</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>(-) Total Operations</td>
<td>$2,076,068</td>
<td>$2,255,721</td>
<td>$2,229,899</td>
<td>$2,414,595</td>
</tr>
<tr>
<td>(-) Total Maintenance</td>
<td>$1,146,425</td>
<td>$1,109,618</td>
<td>$1,081,630</td>
<td>$1,100,364</td>
</tr>
<tr>
<td>(-) Total Debt**</td>
<td>$854,977</td>
<td>$889,978</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Net Operating Revenue</td>
<td>$147,914</td>
<td>$161,549</td>
<td>$2,193,278</td>
<td>$1,520,000</td>
</tr>
</tbody>
</table>

*2015 amounts are projected, final numbers are not yet available
**All debt related to sewer was paid off in 2013

As can be seen in Table 8-3, the total amount expended on debt dropped off in 2014 as a result of the wastewater treatment plant bond being paid off. The sewer utility now is debt free.

Projected Operating Cash Flows

The City's projected operating cash flows show a gradual increase in both estimated revenues and operations and maintenance costs. Revenue increases are attributable
to the aforementioned rate adjustments capped at 2% annual increase and anticipated annual system growth. Expense increases are due to the effect of price inflation and system growth and are forecast at 3% per year. A budget forecast summary is presented in Table 8-4.
### Table 8-4
Projected Operating Cash Flows

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(+) General Revenues*</td>
<td>$4,498,063</td>
<td>$4,588,024</td>
<td>$4,679,785</td>
<td>$4,773,380</td>
<td>$4,868,848</td>
<td>$4,966,225</td>
<td>$80,916,775</td>
</tr>
<tr>
<td>(-) Total Operations**</td>
<td>$2,461,140</td>
<td>$2,534,974</td>
<td>$2,611,023</td>
<td>$2,689,354</td>
<td>$2,770,034</td>
<td>$2,853,135</td>
<td>$50,212,082</td>
</tr>
<tr>
<td>(-) Total Maintenance**</td>
<td>$1,313,633</td>
<td>$1,353,042</td>
<td>$1,393,634</td>
<td>$1,435,443</td>
<td>$1,478,506</td>
<td>$1,522,861</td>
<td>$26,800,701</td>
</tr>
<tr>
<td>Net Operating Revenue</td>
<td>$723,290</td>
<td>$700,008</td>
<td>$675,128</td>
<td>$648,584</td>
<td>$620,308</td>
<td>$590,229</td>
<td>$3,903,992</td>
</tr>
</tbody>
</table>

*General revenues increase at 2% for this model. Per current ordinance, they are CPI adjusted with maximum of 2%

**Both operations and maintenance expenses increase at 3% per year for this model
Projected Operating Cash Flows

- General Revenues*
- Total Operations**
- Total Maintenance**
- Net Operating Revenue
Capital Funds Available for Future Improvements

As indicated in Table 8-4, wastewater operations are expected to generate revenues in excess of O&M which will be available for funding future capital projects. The wastewater utility also generates capital revenues from sources such as general facility charges and recovery contracts (latecomer agreements) that also are available for funding capital projects. Table 8-5 presents a summary of forecasted net revenue from operations and capital revenues that are available for funding planned capital improvements.

As shown in Table 8-5, the wastewater utility is expected to generate approximately $1.4 million in capital improvement funds in 2016, which will be available to construct capital facilities identified in this plan. This amount will gradually decrease over time as expenses are projected to grow faster than revenue.

In order to fund capital projects for the 6-year capital improvement plan (2016 – 2021) as presented in Table 7-1, the City must generate $11.9 million over the next six years. The sanitary sewer collection system, which includes funds that are dedicated to pump station upgrades and general system improvements, accounts for $7.56 million, while Wastewater Treatment Plant improvements total $4.37 million. As summarized in Table 8-5, the wastewater utility will generate approximately $8.4 million between 2016 and 2021. Due to paying off the wastewater treatment plan bonds in 2013, the wastewater utility can fund most of its planned capital improvements from projected operating and capital revenues. However, the planned improvements exceed the expected revenue by $2.5 million over the next 6 years.

As Table 8-5 shows, the capital reserve balance will slowly decrease as yearly spending exceeds revenues. However, the current capital reserve balance of the wastewater utility will enable the city to slowly implement the required rate increases. Also, several alternative funding options, such as grants or low interest rate loans such as Public Works Trust Fund Loans, may be available to the City for consideration in funding capital projects for the wastewater utility. These sources shall be considered when determining additional funding sources for the capital improvement projects in the 6-year CIP.
Table 8-5
Projected Funds Available for Capital Funding

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(+) Transfer from operations</td>
<td>$723,290</td>
<td>$700,008</td>
<td>$675,128</td>
<td>$648,584</td>
<td>$620,308</td>
<td>$590,229</td>
<td>$3,903,992</td>
</tr>
<tr>
<td>(+) GFC Revenue</td>
<td>$785,320</td>
<td>$801,026</td>
<td>$817,047</td>
<td>$833,388</td>
<td>$850,056</td>
<td>$887,057</td>
<td>$13,850,311</td>
</tr>
<tr>
<td>(+) Latecomer Hookup Fee</td>
<td>$81,128</td>
<td>$82,751</td>
<td>$84,406</td>
<td>$86,094</td>
<td>$87,816</td>
<td>$89,572</td>
<td>$1,430,815</td>
</tr>
<tr>
<td>Total Cash Flows</td>
<td>$1,427,482</td>
<td>$1,418,284</td>
<td>$1,407,770</td>
<td>$1,395,878</td>
<td>$1,382,548</td>
<td>$1,367,714</td>
<td>$16,323,488</td>
</tr>
<tr>
<td>Capital Expenses</td>
<td>$2,475,000</td>
<td>$1,433,000</td>
<td>$1,507,000</td>
<td>$1,563,000</td>
<td>$2,386,000</td>
<td>$2,560,000</td>
<td>$37,423,000</td>
</tr>
<tr>
<td>Surplus/(Deficit)</td>
<td>$(1,047,518)</td>
<td>$(14,716)</td>
<td>$(99,230)</td>
<td>$(167,122)</td>
<td>$(1,003,452)</td>
<td>$(1,192,286)</td>
<td>$(21,099,512)</td>
</tr>
<tr>
<td>Beginning Capital Balance</td>
<td>$4,015,923</td>
<td>$2,968,405</td>
<td>$2,963,689</td>
<td>$2,854,458</td>
<td>$2,687,337</td>
<td>$1,683,885</td>
<td>$491,598</td>
</tr>
<tr>
<td>Ending Capital Balance*</td>
<td>$2,968,405</td>
<td>$2,953,689</td>
<td>$2,854,458</td>
<td>$2,687,337</td>
<td>$1,683,885</td>
<td>$491,598</td>
<td>$(20,607,914)</td>
</tr>
</tbody>
</table>

The recently adopted utility financial policies were used to determine the beginning capital reserve balance. The operating as well as capital contingency reserves are fully funded.

*Cash balances are estimated since 2015 year end amounts are not yet available.
Implementation of Utility Financial Policies

In October 2015 the City council passed a resolution adopting utility financial policies that set specific reserve amounts as well as guide the development of user fees and rates. The above discussed rates and projections meet the requirements of the financial policies.

**Operating Reserve**

The wastewater utility has sufficient cash reserves to fully fund the required operating reserve. The projected balance of the operating reserve is $940,000, which is 25% of 2016 budgeted operating expenses.

**Capital Contingency**

As with the operating reserve, the City is able to fully fund the capital contingency at year end 2015 with a projected balance of $510,000.

**Capital Reserve**

The remainder of the wastewater utilities fund balance will be classified as capital reserve. This balance is projected to be $4.1 million at year end 2015 and will be used to fund system improvements over the next six year capital improvement plan period. Without any rate increases, this capital reserve balance is projected to be completely used up by 2021.
APPENDIX A
Determination of Non-Significance (DNS)

Subject Proposal: The non-project legislative action is to update the City of Anacortes Wastewater Comprehensive Plan. The Wastewater Comprehensive Plan is a planning document describing the location and type of facilities needed to provide wastewater service through 2035. It provides recommendations for capital improvement projects which include extensions, repairs, upgrades, rehabilitation, and improvements to sanitary sewer mains, pump stations, and the Wastewater Treatment Plant. The Plan was last updated in 1996.

Applicant/Proponent: City of Anacortes Public Works Department

Location of Proposal: City limits of the City of Anacortes &/or applicable service areas

Lead Agency: City of Anacortes, Planning, Community, & Economic Development Department

Threshold Determination: Determination of Nonsignificance (DNS). The lead agency has determined that this non-project action proposal does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public upon request.

☐ There is no comment period for this DNS.

☒ This DNS is issued under WAC 197-11-340(2); the City of Anacortes will not act on this proposal for 14 days from the date of this notice. Written comments on this threshold determination must be submitted by 5:00 p.m. December 16, 2015. Pursuant to the procedures adopted under AMC § 18.04.250, no administrative appeal of the SEPA threshold determination is provided for this legislative action. The SEPA threshold determination may be appealed to the Skagit County Superior Court under RCW 43.21C.075 after the City's final action on the underlying action(s). The issuance of this DNS does not constitute project approval.

Comments: Please direct any comments concerning this threshold determination to:
Libby Grage, Planning Manager; Planning, Community, & Economic Development Department; P.O. Box 547, Anacortes, WA 98221; libbyb@cityofanacortes.org.

The draft Wastewater Comprehensive Plan document may be viewed on-line at the following address: www.cityofanacortes.org/comprehensive_plans_ENG.php. A public hearing concerning the review, approval, and adoption of the Wastewater Comprehensive Plan will be held before the City Council on a date to be determined.

SEPA Responsible Official: Don Measamer, Director, Planning, Community & Economic Development Department

Signature:

Don Measamer, Interim Director, Planning, Community & Economic Development Department

Date of Decision: November 30, 2015
SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Government agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization, or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements —that do not contribute meaningfully to the analysis of the proposal.
A. BACKGROUND

1. Name of proposed project, if applicable: City of Anacortes Wastewater Comprehensive Plan.

2. Name of applicant: City of Anacortes

3. Address and phone number of applicant and contact person:
   City of Anacortes Public Works Department
   Attn: G. Matt Reynolds
   PO Box 547
   Anacortes, WA 98277
   360-299-1951

4. Date checklist prepared: November 2, 2015

5. Agency requesting checklist: City of Anacortes

6. Proposed timing or schedule (including phasing, if applicable): Projects in the Capital Improvement Plan are identified for construction over 6-year and 20-year periods.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. No. This plan proposal is a result of the Wastewater Comprehensive Plan. Future plan updates or developments unknown to the City at this time may identify wastewater system needs that are not identified in this plan.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. The need for SEPA review for each proposed project will be made on a project specific basis.

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. There are ongoing residential and commercial projects throughout the City's sewer service area. These proposals will continue to be developed and submitted to the City for approval.

10. List any government approvals or permits that will be needed for your proposal, if known. No permits are required. The Plan will need to be approved by the Washington State Department of Ecology and Skagit County. Approvals and permits for specific projects will be addressed on a project specific 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 Anacortes Wastewater Comprehensive Plan is a planning document describing the location and type of facilities needed to provide wastewater...
service through 2035. It provides recommendations for capital improvement projects which include extensions, repairs, upgrades, rehabilitation, and improvements to sanitary sewer mains, pump stations, and the Wastewater Treatment Plant.

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. The project area includes the City's sewer service area as shown in the Plan.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other: The service area is generally flat near the shoreline with hills as high as 900 feet running generally northwest to southeast

b. What is the steepest slope on the site (approximate percent slope)? Approximately 30%.

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 major soil unit for most of the soils is Bow-Coveland-Swinomish. Bow soils are on glacial remnant terraces. They are very deep and somewhat poorly drained, and were formed in glacial drift over glacial lake sediment with a mantle of volcanic ash. Coveland soils are located in swales on glaciated hills. The soils are very deep and somewhat poorly drained. They also formed in glacial lake sediment. Swinomish soils are found on glaciated hills and are moderately deep and moderately well drained. They formed glacial till with an admixture of wind-deposited silts and volcanic ash. Till soils cover approximately 60% of the land area.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. Yes. There are unstable slopes identified along a portion of the Guemes Channel as well as along a portion of the southern Fidalgo Bay.

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. There will be no filling as a direct result of this report. Grading and filling quantities will be addressed on a project specific basis.
f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. Erosion control measures will be addressed on a project specific basis.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? Sewer project generally do not increase impervious surfaces. This will be addressed on a project specific basis.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: This will be addressed on a project specific basis.

2. Air

i. 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. Construction dust and increased exhaust from construction equipment will have a short term impact during construction. This will be addressed on a project specific basis. The existing wastewater treatment plant odor control and incinerator emissions are subject to regulations and permit requirements that will not change as a result of this Plan.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. None known.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: Use of dust control measures during construction and emission control devices will be addresses on a project specific basis.

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. Anacortes is bordered by Burrows Bay, the Guemes Channel, and Fidalgo Bay. Major water bodies include Lake Shannon, Ship Harbor, Little Beaver Pond, Big Beaver Pond, Little Cranberry Lake, 32nd Avenue Swamp, Mitten Pond, and Heart Lake.

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. The Plan identifies some projects within 200 feet of these described waters. Plans will be developed on a project specific basis.
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. This will be addressed on a project specific basis.

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. This will be addressed on a project specific basis.

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. This will be addressed on a project specific basis. The wastewater treatment plant effluent is discharged into the Guemes Channel, which is subject to the requirements of the City's wastewater NPDES permit. Population growth alone would cause the effluent volume to increase over time. However, the inflow and infiltration reduction projects proposed in the Plan will reduce the effluent volume. The net effect is difficult to predict.

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. This will be addressed on a project specific basis.

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. Not applicable.

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. This will be addressed on a project specific basis.

2) Could waste materials enter ground or surface waters? If so, generally describe. The Plan addresses wastewater treatment and discharge as well as inflow and infiltration reduction/improvement to the existing sewer collection system which will help reduce the potential for unintended discharge into ground or surface waters.

j. 3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. It is not expected that drainage patterns will be altered - This will be addressed on a project specific basis.
k. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: This will be addressed on a project specific basis. Measures will be consistent with Department of Ecology and City of Anacortes Standards and applicable code conditions.

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
   - other types of vegetation

b. What kind and amount of vegetation will be removed or altered?
   This will be addressed on a project specific basis.

c. List threatened and endangered species known to be on or near the site.
   This will be addressed on a project specific basis.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
   This will be addressed on a project specific basis.

e. List all noxious weeds and invasive species known to be on or near the site.
   This will be addressed on a project specific basis.

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:
   - mammals: deer, bear, elk, beaver, other:
   - fish: bass, salmon, trout, herring, shellfish, other
   This will be addressed on a project specific basis.
b. List any threatened and endangered species known to be on or near the site.
   *This will be addressed on a project specific basis.*

c. Is the site part of a migration route? If so, explain.
   *This will be addressed on a project specific basis.*

d. Proposed measures to preserve or enhance wildlife, if any:
   *This will be addressed on a project specific basis.*

e. List any invasive animal species known to be on or near the site.
   *This will be addressed on a project specific basis.*

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. The Wastewater Treatment Plant (WWTP) and the pump stations consume electrical energy. Diesel is used to fuel emergency generators and some service vehicles, and is used to help the combustion solids in the WWTP's incinerator. Some service vehicles also run on gasoline.

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:
   The ongoing inflow and infiltration (I/I) reduction projects proposed in the Plan are intended to reduce the amount of influent at the plant which will reduce that amount of treatment and, therefore, reduce energy consumption. I/I reduction will also reduce pump station run times, thereby reducing energy consumption. The ongoing pump station upgrade projects result in more efficient pumps operating in the proper pump curve, which will also reduce energy consumption. The Pump Station #6 Removal project will use gravity to convey sewage that is now pumped, reducing energy consumption. Most projects at the WWTP will result in more efficient operations, thereby reducing energy consumption.

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. During construction, there is a small risk of spills from hydraulic fluid or from sewer bypass pumping. However, the overall result of the projects will be a reduction of risk overall. For example, the inflow and infiltration reduction projects will result in less risk of sewer overflows.
1) Describe any known or possible contamination at the site from present or past uses. This will be addressed on a project specific basis.

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. This will be addressed on a project specific basis.

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. This will be addressed on a project specific basis.

4) Describe special emergency services that might be required. None are expected but construction activities could result in the need for emergency medical services.

5) Proposed measures to reduce or control environmental health hazards, if any: This will be addressed on a project specific basis.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? This will be addressed on a project specific basis.

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. No long term negative effects are expected. Temporary noise will be typical of construction, primarily from the use of heavy equipment. Hours of operation will be addressed on a project specific basis.

3) Proposed measures to reduce or control noise impacts, if any: Construction equipment operation is required to follow local noise ordinances.

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. Land use is a mixture of
residential, commercial, and industrial. Sewer work is typically located within City right-of-way or easements, or on City owned property.

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? This will be addressed on a project specific basis.

1) Will the proposal affect or be affected by surrounding working farmland or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: No affect is expected but this will be addressed on a project specific basis.

c. Describe any structures on the site. Residential, commercial, industrial, and public structures exist throughout the sewer service area.

d. Will any structures be demolished? If so, what? The removal of Pump Station #6 will result in the abandonment of a wet-well and various projects at the WWTP will result in the removal/replacement of equipment. The removal of structures will be addressed on a project specific basis.

e. What is the current zoning classification of the site? Zoning throughout the service area is a mix of residential, commercial, central business, commercial marine, manufacturing, public use, and airport.

f. What is the current comprehensive plan designation of the site? This will be addressed on a project specific basis.

g. If applicable, what is the current shoreline master program designation of the site? This will be addressed on a project specific basis.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. This will be addressed on a project specific basis.

i. Approximately how many people would reside or work in the completed project? The current population of Anacortes is 16,398.

j. Approximately how many people would the completed project displace? None are expected. This will be addressed on a project specific basis.

k. Proposed measures to avoid or reduce displacement impacts, if any: Not applicable

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: This will be addressed on a project specific basis.
m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any: This will be addressed on a project specific basis.

9. Housing
   a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. Not applicable
   
   b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. Not applicable
   
   c. Proposed measures to reduce or control housing impacts, if any: Not applicable

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?
      No new structures are proposed
   
   b. What views in the immediate vicinity would be altered or obstructed?
      None
   
   c. Proposed measures to reduce or control aesthetic impacts, if any: Not applicable

11. Light and glare
   a. What type of light or glare will the proposal produce? What time of day would it mainly occur?
      None of the projects are expected to produce light or glare.
   
   b. Could light or glare from the finished project be a safety hazard or interfere with views?
      Not applicable
   
   c. What existing off-site sources of light or glare may affect your proposal?
      Not applicable
   
   d. Proposed measures to reduce or control light and glare impacts, if any: [help]
12. Recreation
a. What designated and informal recreational opportunities are in the immediate vicinity? This will be addressed on a project specific basis.

b. Would the proposed project displace any existing recreational uses? If so, describe.
No

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:
No negative impact to recreation are expected.

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.
Not likely. This will be addressed on a project specific basis.

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.
This will be addressed on a project specific basis.

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. This will be addressed on a project specific 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.
This will be addressed on a project specific basis.

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.
This will be addressed on a project specific basis. Projects proposed in the Plan typically are within City right-of-way, easements, or City owned property.
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? This will be addressed on a project specific basis.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? Not applicable

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 improvements impacting existing streets will require restoration in accordance with City standards.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. Not applicable

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? Not applicable

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: This will be addressed on a project specific basis.

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. The Plan does not result in an increased need for public services per se. However, the Plan addresses the need for future sewer service which is driven by anticipated growth.

b. Proposed measures to reduce or control direct impacts on public services, if any. Not applicable

16. Utilities

a. Circle utilities currently available at the site:
   electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other __________. All within the service area.

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. Not applicable
C. SIGNATURE

I certify (or declare) under penalty of perjury under laws of the State of Washington that 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 a decision.

Signature: ______________________________

Name of signee: G. Matt Reynolds

Position and Agency/Organization: Assistant Public Works Director

Date Submitted: 11/24/15
**Use of checklist for nonproject proposals:**

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the **SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D)**. Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements—that do not contribute meaningfully to the analysis of the proposal.

**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 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?

Population growth will result in additional flow into the sanitary sewer system while inflow and infiltration reduction will reduce the flow, with a corresponding increase/decrease in the discharge from the wastewater system. Construction projects will temporarily result in normal construction noise and air emissions from construction vehicles and equipment.

Proposed measures to avoid or reduce such increases are:

Construction projects must comply with noise abatement and air quality regulations.
2. How would the proposal be likely to affect plants, animals, fish, or marine life?  
Improvements recommended in the sewer plan are not anticipated to effect plants, animals, fish, or marine life.

   Proposed measures to protect or conserve plants, animals, fish, or marine life are:
   NA

3. How would the proposal be likely to deplete energy or natural resources?  
Population growth will result in additional flow into the sanitary sewer system which will cause an increase in energy consumption due to increased run times at pump stations and additional flow being treated at the wastewater treatment plant.

   Proposed measures to protect or conserve energy and natural resources are:
   Inflow and infiltration reduction will reduce wastewater flows and, therefore, the affect of population growth. Water conservation measures will also help reduce wastewater flows.

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?  
No anticipated affect.

   Proposed measures to protect such resources or to avoid or reduce impacts are:
   NA

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?  
The wastewater plan is consistent with land use plans adopted and under consideration by the City of Anacortes and will not allow or encourage incompatible uses.

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

6. How would the proposal be likely to increase demands on transportation or public services and utilities?  
The improvements recommended in the wastewater plan are primarily infrastructure improvements necessary, at least in part, to meet anticipated growth needs. The Plan itself is not expected to increase demand.
Proposed measures to reduce or respond to such demand(s) are:

In addition to improvements related to growth, the Plan includes recommendations for projects, as well as operational changes, to maintain and improve the overall function of the wastewater system.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

The Plan is consistent with local, state, and federal laws and requirements and all projects will be coordinated with appropriate agencies. The wastewater system exists for the protection of the environment.
June 21, 2012

The Honorable H. Dean Maxwell, Mayor
City of Anacortes
PO Box 547
Anacortes, WA 98221

Re: National Pollutant Discharge Elimination System (NPDES)
   Permit WA-002025-7; City of Anacortes Wastewater Treatment Plant

Under Chapter 90.48 RCW and The Clean Water Act, the enclosed NPDES Permit is being issued to the City of Anacortes Wastewater Treatment Plant located at 500 T Avenue, Anacortes, WA. The permit authorizes the Permittee to discharge treated municipal effluent into Guemes Channel, Puget Sound subject to the terms and conditions of the permit.

The Department of Ecology, in response to the passage of Initiative 97 in 1988, has adopted a regulation to recover costs associated with issuing and administering wastewater discharge permits (Chapter 173-224 WAC). The annual fee for both industrial and municipal/domestic discharges is computed according to the permit fee schedules contained in WAC 173-224-040. Ecology will notify permit holders of fee charges by mailed billing statements.

You have the right to appeal this permit within thirty (30) days upon receipt of this document. Pursuant to chapter 43.21B RCW, your appeal must be filed with the Pollution Control Hearings Board, and served on the Department of Ecology, within thirty (30) days of the date of your receipt of this document.

If you choose to appeal this action or decision, your notice of appeal must contain: (1) A copy of the permit you are appealing, and (2) A copy of the application for the permit.

Your appeal must be filed with:
   The Pollution Control Hearings Board
   4224 - 6th Avenue SE, Rowe Six, Bldg. 2
   P.O. Box 40903
   Lacey, Washington 98504-0903

Your appeal must also be served on:
   The Department of Ecology
   Appeals Coordinator
   P.O. Box 47608
   Olympia, Washington 98504-7608.
In addition, please send a copy of your appeal to:

Laura Fricke
Department of Ecology
Northwest Regional Office
3190 – 160th Avenue SE
Bellevue, WA 98008-5452

An application for permit renewal must be made at least 180 days prior to the expiration date of this permit. If at any time during the term of this permit a question should arise regarding the permit or discharge, or if there is a significant change in the discharge or operation, please contact Laura Fricke at (425) 649-7062 or Email at lfri461@ecy.wa.gov. at our Northwest Regional Office.

Sincerely,

Kevin C. Fitzpatrick
Water Quality Section Manager
Northwest Regional Office

KCF:tm
Enclosures

By Certified Mail 7010 3090 0001 7208 5850

cc: John Franz, City of Anacortes WWTP
    Bev Poston, Permit Fee Unit
    Laura Fricke, P.E., Facility Manager
    Mark Henley, P.E., Municipal Unit Supervisor
    Chris Smith, PARIS
    Central Files: City of Anacortes WWTP; WA002025-7; WQ 1.1
National Pollutant Discharge Elimination System
Waste Discharge Permit No. WA0020257

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 ANACORTES
P.O. Box 547
Anacortes, WA 98221

is authorized to discharge in accordance with the Special and General Conditions that follow.

<table>
<thead>
<tr>
<th>Plant Location:</th>
<th>Discharge Locations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 T Avenue</td>
<td>Outfall 001</td>
</tr>
<tr>
<td>Anacortes, WA 98221</td>
<td>Latitude: 48.523056</td>
</tr>
<tr>
<td></td>
<td>Longitude: -122.608611</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment Type:</th>
<th>Receiving Water:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated Sludge</td>
<td>Guemes Channel, Puget Sound</td>
</tr>
<tr>
<td></td>
<td>Latitude: 48.515278</td>
</tr>
<tr>
<td></td>
<td>Longitude: -122.634167</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discharge Locations:</th>
<th>CSO Outfall 004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude:</td>
<td>48.521667</td>
</tr>
<tr>
<td>Longitude:</td>
<td>-122.609444</td>
</tr>
</tbody>
</table>

Kevin C. Fitzpatrick
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology
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<th>Submittal</th>
<th>Frequency</th>
<th>First Submittal Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3.E</td>
<td>Reporting Permit Violations</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>S4.D</td>
<td>Plans for Maintaining Adequate Capacity</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>S4.D</td>
<td>Notification of New or Altered Sources</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>S5.F</td>
<td>Bypass Notification</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>S5.G</td>
<td>Operations and Maintenance Manual Update</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>S8</td>
<td>Application for Permit Renewal</td>
<td>1/permit cycle</td>
<td>December 30, 2016</td>
</tr>
<tr>
<td>S10</td>
<td>Wet Weather Operation Report</td>
<td>Annually</td>
<td>April 15, 2013</td>
</tr>
<tr>
<td>S11</td>
<td>Outfall Evaluation</td>
<td>1/permit cycle</td>
<td>December 30, 2016</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>April 30, 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Each following October 30 and April 30</td>
</tr>
<tr>
<td>S12.D</td>
<td>Acute Toxicity, &quot;Causes and Preventative Measures for Transient Events&quot;</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>S12.D</td>
<td>Acute Toxicity T/TRE Plan</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>December 30, 2016</td>
</tr>
<tr>
<td>G1</td>
<td>Notice of Change in Authorization</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Reporting Planned Changes</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>G5</td>
<td>Engineering Report for Construction or Modification Activities</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>G7</td>
<td>Notice of Permit Transfer</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>G10</td>
<td>Duty to Provide Information</td>
<td>As necessary</td>
<td></td>
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<tr>
<td>G13</td>
<td>Payment of Fees</td>
<td>As assessed</td>
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<tr>
<td>G20</td>
<td>Compliance Schedules</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>G21</td>
<td>Contract Submittal</td>
<td>As necessary</td>
<td></td>
</tr>
</tbody>
</table>
## 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 and lasting through the expiration date, the Permittee may discharge municipal wastewater to Guemes Channel at the permitted location subject to compliance with the following limits:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Average Monthly</th>
<th>Average Weekly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonaceous Biochemical Oxygen Demand (5-day)</td>
<td>25 milligrams/liter (mg/L) 998 pounds/day (lbs/day) 85% removal of influent CBOD₅</td>
<td>40 mg/L 1,501 lbs/day</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>30 mg/L 1,128 lbs/day 85% removal of influent TSS</td>
<td>45 mg/L 1,686 lbs/day</td>
</tr>
<tr>
<td>pH</td>
<td>6.0 standard units</td>
<td>9.0 standard units</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>200/100 milliliter (mL)</td>
<td>400/100 mL</td>
</tr>
<tr>
<td>Total Residual Chlorine</td>
<td>189 µg/L</td>
<td>494 µg/L</td>
</tr>
<tr>
<td>Acute Toxicity</td>
<td>The effluent limit for acute toxicity is: No acute toxicity detected in a test concentration representing the acute critical effluent concentration (ACEC). The ACEC equals 2.6% effluent. See S12 for more information.</td>
<td></td>
</tr>
</tbody>
</table>

#### Footnotes:

- **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 limitation 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 publication No. 04-10-020, Information Manual for Treatment Plant Operators, provides directions to calculate the monthly and the 7-day geometric mean. See: http://www.ecy.wa.gov/pubs/0410020.pdf

- **d** Maximum daily effluent limit is the highest allowable daily discharge. The daily discharge is the average discharge of a pollutant measured during a calendar day. For pollutants with limits expressed in units of mass, calculate the daily discharge as the total mass of the pollutant discharged over the day. This does not apply to pH or temperature.
S1.B. Mixing zone authorization

Mixing zone for outfall no.001

The following paragraphs define the maximum boundaries of the mixing zones:

Chronic mixing zone

The mixing zone is a circle with radius of 231 feet (70.4 meters) measured from the center of each discharge port. 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 acute mixing zone is a circle with radius of 23.1 feet (7.04 meters) measured from the center of each discharge port. 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.

<table>
<thead>
<tr>
<th>Available Dilution (dilution factors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Aquatic Life Criteria</td>
</tr>
<tr>
<td>Chronic Aquatic Life Criteria</td>
</tr>
<tr>
<td>Human Health Criteria - Carcinogen</td>
</tr>
<tr>
<td>Human Health Criteria - Non-carcinogen</td>
</tr>
</tbody>
</table>

S2. Monitoring requirements

S2.A. Monitoring schedule

The Permittee must monitor in accordance with the following schedule and the requirements specified in Appendix A.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units &amp; Speciation</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater Influent</td>
<td>mg/L</td>
<td>2/month</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Biochemical Oxygen Demand (BOD₅)</td>
<td>lbs/day</td>
<td>2/month</td>
<td>Calculated</td>
</tr>
<tr>
<td>Carbonaceous Biochemical Oxygen Demand (CBOD₅)</td>
<td>mg/L</td>
<td>3/week</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>mg/L</td>
<td>3/week</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS)</td>
<td>lbs/day</td>
<td>3/week</td>
<td>Calculated</td>
</tr>
</tbody>
</table>
### (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 BOD₅ analysis before or after the disinfection process. If taken after, the Permittee must dechlorinate and reseed the sample.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units &amp; Specification</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>MGD</td>
<td>Continuous</td>
<td>Metered/recorded</td>
</tr>
<tr>
<td>CBOD₅</td>
<td>mg/L</td>
<td>3/week</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>CBOD₅</td>
<td>lbs/day</td>
<td>3/week</td>
<td>Calculated</td>
</tr>
<tr>
<td>CBOD₅ % removal</td>
<td>%</td>
<td>1/month</td>
<td>Calculated</td>
</tr>
<tr>
<td>TSS</td>
<td>mg/L</td>
<td>3/week</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>TSS % removal</td>
<td>%</td>
<td>1/month</td>
<td>Calculated</td>
</tr>
<tr>
<td>Chlorine (Total Residual)</td>
<td>µg/L</td>
<td>1/day</td>
<td>Grab</td>
</tr>
<tr>
<td>Fecal Coliform</td>
<td>#Organisms /100 ml</td>
<td>3/week</td>
<td>Grab</td>
</tr>
<tr>
<td>pH</td>
<td>Standard Units</td>
<td>1/day</td>
<td>Measurement</td>
</tr>
<tr>
<td>Temperature</td>
<td>Degrees centigrade (°C)</td>
<td>1/day</td>
<td>Grab</td>
</tr>
</tbody>
</table>

### (3) Whole Effluent Toxicity Testing -- Final Wastewater Effluent

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Test Method</th>
<th>Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity Testing</td>
<td>See S12</td>
<td>2/year (February &amp; August)</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Chronic Toxicity Testing</td>
<td>See S13</td>
<td>2/year in last year only (April &amp; October 2016)</td>
<td>24-hour composite</td>
</tr>
</tbody>
</table>

### (4) Effluent Characterization -- Final Wastewater Effluent

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units &amp; Specification</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Ammonia</td>
<td>mg/L as N</td>
<td>1/month</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>mg/L as P</td>
<td>1/month</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Soluble Reactive Phosphorus</td>
<td>mg/L as P</td>
<td>1/month</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Nitrate-Nitrite Nitrogen</td>
<td>mg/L as N</td>
<td>1/month</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen (TKN)</td>
<td>mg/L as N</td>
<td>1/month</td>
<td>24-hour composite</td>
</tr>
</tbody>
</table>

### (5) 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 for priority pollutant testing with the discharge monitoring report.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units &amp; Specification</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolved Oxygen</td>
<td>mg/L</td>
<td>1/year</td>
<td>Grab</td>
</tr>
<tr>
<td>Oil and Grease</td>
<td>mg/L</td>
<td>1/year</td>
<td>Grab</td>
</tr>
<tr>
<td>Total Dissolved Solids</td>
<td>mg/L</td>
<td>1/year</td>
<td>24-Hour composite</td>
</tr>
<tr>
<td>Total Hardness</td>
<td>mg/L</td>
<td>1/year</td>
<td>24-Hour composite</td>
</tr>
<tr>
<td>Priority Pollutants (PP) -- Metals, Cyanide, &amp; Total Phens</td>
<td>µg/L; nanograms/ng/L for mercury</td>
<td>1/year</td>
<td>Grab for mercury, cyanide, and total phenols</td>
</tr>
<tr>
<td>PP - Volatile Compounds</td>
<td>µg/L</td>
<td>1/year</td>
<td>Grab</td>
</tr>
<tr>
<td>PP - Acid Compounds</td>
<td>µg/L</td>
<td>1/year</td>
<td>24-Hour composite</td>
</tr>
<tr>
<td>PP - Base/Neutral Compounds</td>
<td>µg/L</td>
<td>1/year</td>
<td>24-Hour composite</td>
</tr>
</tbody>
</table>

### (6) Combined Sewer Overflows (CSO)

CSO discharge is defined as any untreated CSO which will exit or has exited any CSO outfall. See Section S9.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units &amp; Specification</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume Discharged</td>
<td>Gallons</td>
<td>Per Event</td>
<td>Measurement/Calculation</td>
</tr>
<tr>
<td>Discharge Duration</td>
<td>Hours</td>
<td>Per Event</td>
<td>Measurement</td>
</tr>
</tbody>
</table>
Storm Duration | Hours | Per Event | Measurement | **Parameter** | Units & Specification | Minimum Sampling Frequency | Sample Type
---|---|---|---|---|---|---|---
Precipitation | Inches | Per Event | Measurement/Calculation

| a | 24-hour composite means a series of individual samples collected over a 24-hour period into a single container, and analyzed as one sample. |
|---|---|---|---|---|---|---|---
| b | Calculation 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 |
| c | Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance. |
| d | % removal = \( \frac{(\text{Influent concentration (mg/L)} - \text{Effluent concentration (mg/L)}) \times 100}{\text{Influent concentration(mg/L)}} \)

Calculate the percent (%) removal of CBOD₅ and TSS using the above equation.

| f | Report the daily pH and the minimum and maximum for the monitoring period. |
| g | Temperature grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon. If measuring temperature continuously, the Permittee must determine and report a daily maximum from half-hour measurements in a 24-hour period. Continuous monitoring Instruments must achieve an accuracy of 0.2 degrees C and the Permittee must verify accuracy annually. |
| h | See Appendix A for the required detection (DL) or quantitation (QL) levels.

Report single analytical values below detection as “less than (detection level)” where (detection level) is the numeric value specified in Appendix A.

Report single analytical values between the agency-required detection and quantitation levels with qualifier code of j following the value.

To calculate the average value (monthly average):

- Use the reported numeric value for all parameters measured between the agency-required detection value and the agency-required quantitation value.
- For values reported below detection, use one-half the detection value if the lab detected the parameter in another sample for the reporting period.
- For values reported below detection, use zero if the lab did not detect the parameter in another sample for the reporting period.

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.

| i | Per Event means a unique CSO event, defined as any 24-hour period when a CSO discharge or multiple discharges occur. |
| j | Measurement/Calculation means the total volume of the discharge or amount of precipitation event as estimated by direct measurement or indirectly by calculation (i.e. flow weirs, pressure transducers, tipping bucket). The Permittee must use the nearest possible precipitation-measuring device to measure and report precipitation and actively monitor the device during the period of interest. |
| k | Storm duration is the amount of total time when precipitation occurred that contributed to a discharge event. It is determined on a case-by-case basis. |
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.

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. Calibrate continuous monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring records. The Permittee may calibrate apparatus for continuous monitoring of dissolved oxygen by air calibration.

4. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.

5. Calibrate these devices at the frequency recommended by the manufacturer.

6. Calibrate flow monitoring devices at a minimum frequency of at least one calibration per year.

7. Maintain calibration records for at least three years.

S2.D. Laboratory accreditation

The Permittee must ensure that all monitoring data required by Ecology 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. The Permittee must obtain accreditation for conductivity and pH if it must receive accreditation or registration for other parameters.

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 a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by Ecology. Include a summary listing daily results for the parameters tabulated in Special Condition S2, including MDLs and QLs (when applicable). If submitting DMRs electronically, report a value for each day sampling occurred and for the summary values (when applicable) included on the form.

2. Submit the form as required with the words "no discharge" entered in place of the monitoring results, if the facility did not discharge during a given monitoring period. If submitting DMRs electronically, you must enter "no discharge" for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate.

3. Report the test method, the DL, and the QL on the discharge monitoring report or in the required report, if the Permittee used an alternative method not specified in the permit and as allowed in Appendix A.

4. Include the following information (for priority pollutant organic and metal parameters lab reports): sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), laboratory practical quantitation limit (PQL), reporting units, and concentration detected. The Permittee must submit a copy of the contract laboratory report to provide this information. Analytical results from samples sent to a contract laboratory must also include information on the chain of custody, QA/QC results, and documentation of accreditation for the parameter. If the Permittee submits electronic DMRs, then it must attach an electronic file of the lab report to the electronic DMR.

5. Ensure that DMR forms are postmarked or received by Ecology no later than the dates specified below, unless otherwise specified in this permit. If submitting DMRs electronically, submit the DMR no later than the dates specified below, unless otherwise specified in this permit.

   a. The Permittee must submit monthly DMRs by the 15th day of the following month.

   b. Submit whole effluent toxicity test reports and annual effluent monitoring reports according to the schedule specified in the “Summary of Permit Report Submittals” and in S12 and S13.
6. Submit reports to Ecology online using Ecology’s electronic DMR submittal forms or send 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 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.

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, Shellfish Program, and the Local Health Jurisdiction (at the numbers listed below), all:

- Failures of the disinfection system.
- Non-CSO collection system overflows that discharge to marine surface water or in areas open to public access.
- Plant bypasses discharging to marine surface waters.
- Any other failures of the sewage system that may impact marine water or public health.

<table>
<thead>
<tr>
<th>Northwest Regional Office</th>
<th>425-649-7000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Health,</td>
<td>360-236-3330 (business hours)</td>
</tr>
<tr>
<td>Shellfish Program</td>
<td>360-789-8962 (after business hours)</td>
</tr>
<tr>
<td>Skagit County Health Department</td>
<td>360-336-9474</td>
</tr>
</tbody>
</table>

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.
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 non-CSO 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 provide a written submission within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The written submission 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**

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. You can obtain further instructions at the following website:


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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Month Design Flow (MMDF)</td>
<td>4.5 MGD</td>
</tr>
<tr>
<td>BOD$_5$ Influent Loading for Maximum Month</td>
<td>6,400 lbs/day</td>
</tr>
<tr>
<td>TSS Influent Loading for Maximum Month</td>
<td>6,400 lbs/day</td>
</tr>
</tbody>
</table>
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.
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)].

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 III 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 II 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 non-critical 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 430/9-74-001) 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), or transport of untreated wastes to another treatment facility.

c. Ecology is properly notified of the bypass as required in 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 submission and requirements

The Permittee must:

1. Review and update the O&M Manual as needed according to the requirements of 173-240-150 WAC.

2. Submit to Ecology for review substantial changes or updates to the O&M Manual whenever it incorporates them into the manual. The Permittee must submit an electronic copy (preferably as a PDF).

3. Keep the approved O&M Manual at the permitted facility.

4. 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. Wastewater system maintenance procedures that contribute to the generation of process wastewater.

3. Reporting protocols for submitting reports to Ecology to comply with the reporting requirements in the discharge permit.

4. 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).
5. The treatment plant process control monitoring schedule.

6. Minimum staffing adequate to operate and maintain the treatment processes and carry out compliance monitoring required by the permit.

7. 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, (BODs, 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 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 significant industrial user (SIU) [see fact sheet definitions or refer to 40 CFR 403.5(i)(i)(ii)].

3. Require all SIUs to obtain a SWDP from Ecology prior to accepting their non-domestic 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 B 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.

S6.E. Industrial user survey

The Permittee must complete an industrial user survey listing all SIUs and potential significant industrial users (PSIUs) discharging to the POTW. The Permittee must submit the survey to Ecology by December 30, 2016. At a minimum, the Permittee must develop the list of SIUs and PSIUs by means of a telephone book search, a water utility billing records search, and a physical reconnaissance of the service area. Information on PSIUs must include, at a minimum, the business name, telephone number, address, description of the industrial process(es), and the known wastewater volumes and characteristics.

S7. Solid wastes

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.

S8. Application for permit renewal or modification for facility changes

The Permittee must submit an application for renewal of this permit by December 30, 2016. 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.
S9. Combined sewer overflows

S9.A. Authorized combined sewer overflow (CSO) discharge locations

The following list of combined sewer overflow (CSO) outfalls represents occasional point sources of pollutants as a result of overloading of the combined sewer system from precipitation events. This permit prohibits discharges not caused by precipitation. This permit does not authorize a discharge from a CSO outfall that causes adverse impacts that threaten characteristic uses of the receiving water as identified in the water quality standards, chapter 173-201A WAC.

<table>
<thead>
<tr>
<th>CSO Outfall Number</th>
<th>CSO Location</th>
<th>Receiving Water Body</th>
<th>Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>North end of B Avenue</td>
<td>Guemes Channel</td>
<td>48.515278</td>
<td>-122.634167</td>
</tr>
<tr>
<td>004</td>
<td>North end of Q Avenue</td>
<td>Guemes Channel</td>
<td>48.521667</td>
<td>-122.609444</td>
</tr>
</tbody>
</table>

S9.B. CSO annual monitoring report

The Permittee must submit to Ecology for review and approval by April 15th of each year an annual CSO report that covers the previous calendar year. The Annual CSO Report must include the following:

1. A summary of the number and volume of untreated discharge events per outfall for that year.
2. A summary of the 5-year moving average number of untreated discharge events per outfall, calculated once annually.
3. Complete event-based reporting form (provided by Ecology) for all CSO discharges for the reporting period, summarizing all monitoring data in S2.

Documentation of compliance with the Nine Minimum Controls for CSOs described in section S9.C.

S9.C. Nine minimum controls

In accordance with chapter 173-245 WAC and US EPA CSO control policy (59 FR 18688), the Permittee must implement and document the following nine minimum controls (NMC) for CSOs. The Permittee must document compliance with the NMC in the annual CSO report as required in S9.B.

The Permittee must comply with the following technology-based requirements; the Permittee must:

1. Implement proper operation and maintenance programs for the sewer system and all CSO outfalls to reduce the magnitude, frequency, and duration of CSOs. The program must consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.
2. Implement procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.

3. Review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from the discharges from non-domestic users.

4. Operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The Permittee must deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.

5. Not discharge overflows from CSO outfalls during dry weather. The Permittee must report each dry weather overflow to the permitting authority as soon as it becomes aware of the overflow. When it detects a dry weather overflow, the Permittee must begin corrective action immediately and inspect the dry weather overflow each subsequent day until it has eliminated the overflow.

6. Implement measures to control solid and floatable materials in CSOs.

7. Implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

8. Implement a public notification process to inform the citizens of when and where CSOs occur. The process must include (a) mechanism to alert persons of the occurrence of CSOs and (b) a system to determine the nature and duration of conditions that are potentially harmful for users of receiving waters due to CSOs.

9. Monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls. This must include collection of data that it will use to document the existing baseline conditions, evaluate the efficacy of the technology-based controls, and determine the baseline conditions upon which it will base the long-term control plan. This data must include:
   a. Characteristics of the combined sewer system, including the population served by the combined portion of the system and locations of all CSO outfalls in the CSS.
   b. Total number of CSO events, and the frequency and duration of CSOs for a representative number of events.
   c. Locations and designated uses of receiving water bodies.
   d. Water quality data for receiving water bodies.
   e. Water quality impacts directly related to CSO (e.g., beach closing, floatables, wash-up episodes, fish kills).
S9.D. Requirements for controlled CSO outfalls

1. CSOs identified as controlled

Based on monitoring data, the CSO outfalls listed in S9.A meet the requirement of "greatest reasonable reduction," defined in WAC 173-245-020(22). Frequency of overflow events at these CSO outfalls, as a result of precipitation events, must continue to meet the performance standard.

2. Performance standard for controlled CSO outfalls

The performance standard for controlled CSOs is not more than one discharge event per outfall per year on average. Ecology will evaluate compliance with the performance standard annually based on a 5-year moving average. The averaging period includes the past four years and the current year. The Permittee must report the average number of discharge events per controlled outfall per year based on a 5-year moving average in the annual CSO report.

3. Post Construction Monitoring Program

The Permittee must implement a post construction compliance monitoring program to verify the effectiveness of CSO controls and to demonstrate compliance with water quality standards and protection of designated uses.

   a. CSO Post Construction Monitoring Plan

The Permittee must submit to Ecology for review and approval a CSO Post Construction Monitoring Plan no later than June 30, 2015. The plan must describe the monitoring protocols to be followed, including effluent monitoring and, where appropriate, other monitoring protocols such as ambient monitoring, biological assessments, whole effluent toxicity testing, and sediment sampling.

   b. CSO Post Construction Monitoring Data Report

Following Ecology approval of the CSO Post Construction Monitoring Plan, the Permittee must implement the plan. The Permittee must submit to Ecology a data report containing the results of the monitoring and analysis by December 30, 2016. The data report must conform to the approved CSO Post Construction Monitoring Plan.

S10. Wet weather operation

This permit authorizes CSO-related bypasses of the secondary treatment portion of the Anacortes WWTP when the instantaneous flow rate to the WWTP exceeds 7.8 MGD as a result of precipitation events. Bypasses that occur when the instantaneous flow rate is less than 7.8 MGD are not authorized under this condition and are subject to the bypass provisions as stated in S5.F of the permit. In the event of a CSO-related bypass authorized under this condition, the Permittee must minimize the discharge of pollutants to the environment. At a minimum, CSO-related bypass flows must receive solids and floatables removal, primary clarification, and disinfection. The final discharge must at all times meet the effluent limits of this permit as listed in S1.
The Permittee must maintain records of all CSO-related bypasses at the treatment plant. All occurrences of bypassing must be reported on a monthly and annual basis. These records must document. The records must also indicate the instantaneous influent flow rate at the time when bypassing is initiated.

1. The monthly discharge monitoring report must include the date, duration, and volume of each bypass event, and the magnitude of the precipitation event.
2. All of the above information in summary format should be included in the annual CSO report.

S11. Outfall evaluation

The Permittee must inspect the submerged portion of the outfall line and diffuser to document its integrity and continued function. If conditions allow for a photographic verification, the Permittee must include such verification in the report. If damage is found, the report must include a plan for completing repairs. The Permittee must submit the inspection report to Ecology by December 30, 2016.

S12. Acute toxicity

S12.A. Effluent limit for acute toxicity

The effluent limit for acute toxicity is:

No acute toxicity detected in a test concentration representing the acute critical effluent concentration (ACEC).

The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Section S1 of this permit. The ACEC equals 2.6% effluent.

S12.B. Compliance with the effluent limit for acute toxicity

Compliance with the effluent limit for acute toxicity means the results of the testing specified in Section C show no statistically significant difference in survival between the control and the ACEC.

If the test results show a statistically significant difference in survival between the control and the ACEC, the test does not comply with the effluent limit for acute toxicity. The Permittee must then immediately conduct the additional testing described in Section D. The Permittee will comply with the requirements of this section by meeting the requirements of Section D.

The Permittee must determine the statistical significance by conducting a hypothesis test at the 0.05 level of significance (Appendix H, EPA/600/4-89/001). If the difference in survival between the control and the ACEC is less than 10%, the Permittee must conduct the hypothesis test at the 0.01 level of significance.
S12.C. Compliance testing for acute toxicity

The Permittee must:

1. Perform the acute toxicity tests with 100% effluent, the ACEC (2.6% effluent), and a control, or with a full dilution series.

2. Conduct acute toxicity testing on the final effluent in February and August of each year. The Permittee must perform compliance tests using the species and protocols listed in the table below.

3. Submit a written report to Ecology no later than April 30 and October 30 of each year. Further instructions on testing conditions and test report content are in Section E below.

<table>
<thead>
<tr>
<th>Acute Toxicity Tests</th>
<th>Species/Method</th>
<th>Test Date</th>
<th>Written Report Submittal Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fathead minnow 96-hour static-renewal test</td>
<td><em>Pimephales promelas</em> / EPA-821-R-02-012</td>
<td>August 2012</td>
<td>October 30, 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>February 2013</td>
<td>April 30, 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>August 2014</td>
<td>October 31, 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>February 2015</td>
<td>April 30, 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>August 2016</td>
<td>October 31, 2016</td>
</tr>
<tr>
<td>Daphnid 48-hour static test</td>
<td><em>Ceriodaphnia dubia</em>, <em>Daphnia pulex</em>, or <em>Daphnia magna</em> / EPA-821-R-02-012</td>
<td>August 2013</td>
<td>October 31, 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>February 2014</td>
<td>April 30, 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>August 2015</td>
<td>October 31, 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>February 2016</td>
<td>April 30, 2016</td>
</tr>
</tbody>
</table>

S12.D. Response to noncompliance with the effluent limit for acute toxicity

If a toxicity test conducted under Section C determines a statistically significant difference in response between the ACEC and the control, using the statistical test described in Section C; the Permittee must begin additional testing within one week from the time of receiving the test results. The Permittee must:

1. Conduct one additional test each week for four consecutive weeks, using the same test and species as the failed compliance test. Test the next four discharge events using the same test and species as the failed compliance test (Use for intermittent discharges).

2. Test at least five effluent concentrations and a control to determine appropriate point estimates. One of these effluent concentrations must equal the ACEC. The results of the test at the ACEC will determine compliance with the effluent limit for acute toxicity as described in Section A.
3. Return to the original monitoring frequency in Section C after completion of the additional compliance monitoring.

Anomalous test results: If a toxicity test conducted under Section C indicates noncompliance with the acute toxicity limit and the Permittee believes that the test result is anomalous, the Permittee may notify Ecology that the compliance test result may be anomalous. The Permittee may take one additional sample for toxicity testing and wait for notification from Ecology before completing the additional testing. The Permittee must submit the notification with the report of the compliance test result and identify the reason for considering the compliance test result to be anomalous.

If Ecology determines that the test result was not anomalous, the Permittee must complete all of the additional monitoring required in this section. Or,

If the one additional sample fails to comply with the effluent limit for acute toxicity, then the Permittee must complete all of the additional monitoring required in this section. Or,

If Ecology determines that the test result was anomalous, the one additional test result will replace the anomalous test result.

If all of the additional testing in this section complies with the permit limit, the Permittee must submit a report to Ecology on possible causes and preventive measures for the transient toxicity event, which triggered the additional compliance monitoring. This report must include a search of all pertinent and recent facility records, including:

- Operating records
- Monitoring results
- Inspection records
- Spill reports
- Weather records
- Production records
- Raw material purchases
- Pretreatment records, etc.

If the additional testing in this section shows another violation of the acute toxicity limit, the Permittee must submit a Toxicity Identification/Reduction Evaluation (TI/RE) plan to Ecology within sixty (60) days after the sample date (WAC 173-205-100(2)).

S12.E. Sampling and reporting requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.
2. The Permittee must collect 24-hour composite effluent samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.

3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria.

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Subsection C and the Ecology Publication No. WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.

5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Section A or pristine natural water of sufficient quality for good control performance.

6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.

7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the acute critical effluent concentration (ACEC). The ACEC equals 2.6% effluent.

8. All whole effluent toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

S13. Chronic toxicity

S13.A. Testing when there is no permit limit for chronic toxicity

The Permittee must:

1. Conduct chronic toxicity testing on final effluent during April 2016 and October 2016.

2. Submit the results to Ecology by June 30, 2016 and December 30, 2016.

3. Conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control. This series of dilutions must include the acute critical effluent concentration (ACEC). The ACEC equals 2.6% effluent. The series of dilutions should also contain the CCEC of 1.4% effluent.
4. Compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.

5. Perform chronic toxicity tests with all of the following species and the most recent version of the following protocols:

<table>
<thead>
<tr>
<th>Saltwater Chronic Test</th>
<th>Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topsmelt survival and growth</td>
<td>Atherinops affinis</td>
<td>EPA/600/R-95/136</td>
</tr>
<tr>
<td>Mysid shrimp survival and growth</td>
<td>Americamysis bahia (formerly Mysidopsis bahia)</td>
<td>EPA-821-R-02-014</td>
</tr>
</tbody>
</table>

S13.B. Sampling and reporting requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the most recent version of Ecology Publication No. WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Reports must contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology’s database, then the Permittee must send the data to Ecology along with the test report, bench sheets, and reference toxicant results.

2. The Permittee must collect 24-hour composite effluent samples for toxicity testing. The Permittee must cool the samples to 0 - 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.

3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the most recent version of Ecology Publication No. WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria.

4. All toxicity tests must meet quality assurance criteria and test conditions specified in the most recent versions of the EPA methods listed in Section A and the Ecology Publication no. WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.

5. The laboratory must use control water and dilution water meeting the requirements of the EPA methods listed in Subsection A or pristine natural water of sufficient quality for good control performance.

6. The Permittee must conduct whole effluent toxicity tests on an unmodified sample of final effluent.

7. The Permittee may choose to conduct a full dilution series test during compliance testing in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the CCEC and the ACEC. The CCEC and the
ACEC may either substitute for the effluent concentrations that are closest to them in the dilution series or be extra effluent concentrations. The CCEC equals 1.4% effluent. The ACEC equals 2.6% effluent.

8. All whole effluent toxicity tests that involve hypothesis testing must comply with the chronic statistical power standard of 39% as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.
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.
      • In the case of a partnership, by a general partner.
      • In the case of sole proprietorship, by the proprietor.
      • 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 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 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 sixty (60) 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 (B) below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR 122.62(b)(2), or a minor modification made under 40 CFR 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

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 must 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 Condition S3.E.
4. The Permittee complied with any remedial measures required under S4.C 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 must, 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 must 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. Contract review

The Permittee must submit to Ecology any proposed contract 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. In the event that Ecology does not comment within a thirty (30)-day period, the Permittee may assume consistency and proceed with the contract.
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.

When the permit requires the Permittee to measure the base neutral compounds in the list of priority pollutants, it must measure all of the base neutral pollutants listed in the table below. The list includes EPA required base neutral priority pollutants and several additional polynuclear aromatic hydrocarbons (PAHs). The Water Quality Program added several PAHs to the list of base neutrals below from Ecology’s Persistent Bioaccumulative Toxics (PBT) List. It only added those PBT parameters of interest to Appendix A that did not increase the overall cost of analysis unreasonably.

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

<table>
<thead>
<tr>
<th>Pollutant &amp; CAS No. (if available)</th>
<th>Recommended Analytical Protocol</th>
<th>Detection (DL) ( ^1 ) ( \mu g/L ) unless specified</th>
<th>Quantitation Level (QL) ( ^2 ) ( \mu g/L ) unless specified</th>
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</thead>
<tbody>
<tr>
<td>Biochemical Oxygen Demand</td>
<td>SM5210-B</td>
<td>2 mg/L</td>
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<tr>
<td>Chemical Oxygen Demand</td>
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<tr>
<td>Total Organic Carbon</td>
<td>SM5310-B/C/D</td>
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<tr>
<td>Total Suspended Solids</td>
<td>SM2540-D</td>
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<td>Total Ammonia (as N)</td>
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<tr>
<td>Flow</td>
<td>Calibrated device</td>
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<tr>
<td>Dissolved oxygen</td>
<td>SM4500-CC/OG</td>
<td>0.2 mg/L</td>
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<td>Temperature (max. 7-day avg.)</td>
<td>Analog recorder or Use micro-recording devices known as thermistors</td>
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<tr>
<td>pH</td>
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<td>N/A</td>
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<td>Pollutant &amp; CAS No. (if available)</td>
<td>Recommended Analytical Protocol</td>
<td>Detection Level (DL)</td>
<td>Quantitation Level (QL)^2</td>
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<tr>
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<td>--------------------------</td>
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<tr>
<td>Total Alkalinity</td>
<td>SM2320-B</td>
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<td>Fluoride (16984-48-8)</td>
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<td>Nitrate-Nitrite (as N)</td>
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<td>Oil and Grease (HEM)</td>
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<td>1,400</td>
<td>5,000</td>
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<tr>
<td>Salinity</td>
<td>SM2520-B</td>
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<td>Settleable Solids</td>
<td>SM2540- F</td>
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<td>Sulfate (as mg/L SO₄)</td>
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<td>Sulfide (as mg/L S)</td>
<td>SM4500-S²F/D/E/G</td>
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<td>Sulfite (as mg/L SO₃)</td>
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<td>Total dissolved solids</td>
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<td>Total Hardness</td>
<td>SM2340B</td>
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<td>BTEX (benzene + toluene + ethylbenzene + m,o,p-xylenes)</td>
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<td>Cobalt, Total (7440-48-4)</td>
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<td>Iron, Total (7439-89-9)</td>
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<td>Magnesium, Total (7439-95-4)</td>
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<td>Manganese, Total (7439-96-5)</td>
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<td>Ecology NWTPH Dx</td>
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<td>NWTPH Gx</td>
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<td>Tin, Total (7440-31-5)</td>
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<td>Titanium, Total (7440-32-6)</td>
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<td>0.5</td>
<td>2.5</td>
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## PRIORITY POLLUTANTS

<table>
<thead>
<tr>
<th>Pollutant &amp; CAS No. (if available)</th>
<th>Recommended Analytical Protocol</th>
<th>Detection (DL) $^1$ (μg/L unless specified)</th>
<th>Quantitation Level (QL) $^2$ (μg/L unless specified)</th>
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<tbody>
<tr>
<td><strong>METALS, CYANIDE &amp; TOTAL PHENOLS</strong></td>
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<tr>
<td>Antimony, Total (7440-36-0)</td>
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<td>Arsenic, Total (7440-38-2)</td>
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<td>Beryllium, Total (7440-41-7)</td>
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<td>Cadmium, Total (7440-43-9)</td>
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<td>Chromium (hex) dissolved (18540-29-8)</td>
<td>SM3500-Cr EC</td>
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<td>Chromium, Total (7440-47-3)</td>
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<td>Copper, Total (7440-50-8)</td>
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<td>Lead, Total (7439-92-1)</td>
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<td>Mercury, Total (7439-97-6)</td>
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<td>Cyanide, Weak Acid Dissociable</td>
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<td>Cyanide, Free Amenable to Chlorination (Available Cyanide)</td>
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<td>Phenols, Total</td>
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<td><strong>ACID COMPOUNDS</strong></td>
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<td>2-Chlorophenol (95-57-6)</td>
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<td>2,4-Dichlorophenol (120-83-2)</td>
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<td>2,4-Dimethylphenol (105-87-9)</td>
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<td>4,6-dinitro-o-cresol (534-52-1)</td>
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<td>2,4 dinitrophenol (51-28-5)</td>
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<td>2-Nitrophenol (88-75-5)</td>
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<td>4-nitrophenol (100-02-7)</td>
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<td>Parachlororore cresol (59-50-7)</td>
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<td>Pentachlorophenol (87-86-5)</td>
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<td>Phenol (108-85-2)</td>
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<td>2,4,6-Trichlorophenol (88-06-2)</td>
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### PRIORITY POLLUTANTS (continued)

<table>
<thead>
<tr>
<th>Pollutant &amp; GAS No. (if available)</th>
<th>Recommended Analytical Protocol</th>
<th>Detection (DL) (^1) (\mu g/l) unless specified</th>
<th>Quantitation Level (QL) (^2) (\mu g/l) unless specified</th>
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<tr>
<td><strong>VOLATILE COMPOUNDS</strong></td>
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<td>Acrolein (107-02-8)</td>
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<td>Acrylonitrile (107-13-1)</td>
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<td>Benzene (71-43-2)</td>
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<td>Bromoform (75-25-2)</td>
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<td>Carbon tetrachloride (56-23-5)</td>
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<td>Chloroethane (75-00-3)</td>
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<td>Chloroform (67-66-3)</td>
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<td>Dibromochloromethane (124-48-1)</td>
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<td>1,2-Dichlorobenzene (95-50-1)</td>
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<td>1,3-Dichlorobenzene (541-73-1)</td>
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<td>1,4-Dichlorobenzene (106-48-7)</td>
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<td>1,2-Dichloroethane (107-06-2)</td>
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<td>1,1-Dichloroethylene (75-35-4)</td>
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<td>1,2-Dichloropropane (78-87-5)</td>
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<td>1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) (542-75-3)</td>
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<td>Tetrachloroethylene (127-18-4)</td>
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<td>1,2-Trans-Dichloroethylene (156-60-5) (Ethylene dichloride)</td>
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<td>1,1,2-Trichloroethane (79-00-5)</td>
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<td>Trichloroethylene (79-01-6)</td>
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<td>Vinyl chloride (75-01-4)</td>
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### PRIORITY POLLUTANTS (continued)

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<tr>
<th>Pollutant &amp; CAS No. (if available)</th>
<th>Recommended Analytical Protocol</th>
<th>Detection (DL)(^1) µg/L unless specified</th>
<th>Quantitation Level (QL)(^2) µg/L unless specified</th>
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<tbody>
<tr>
<td><strong>BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)</strong></td>
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<td>Acenaphthene (83-32-9)</td>
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<td>Acenaphthylene (208-96-8)</td>
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<td>Anthracene (120-12-7)</td>
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<td>Benzidine (92-87-5)</td>
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<td>Benzy] butyl phthalate (85-68-7)</td>
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<tr>
<td>Benzo(a)anthracene (56-55-3)</td>
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<td>0.6</td>
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<tr>
<td>Benzo(b)fluoranthene (3,4-benzofluoranthene) (205-99-2)(^4)</td>
<td>610/625</td>
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<tr>
<td><strong>Benzo(j)fluoranthene (205-82-3)(^4)</strong></td>
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<td>Benzo(k)fluoranthene (11,12-benzofluoranthene) (207-08-9)(^4)</td>
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<td><strong>Benzo(r,s,t)pentaphene (169-55-9)</strong></td>
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<td>Benzo(a)pyrene (50-32-8)</td>
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<td>Benzo(ghi)Perylene (191-24-2)</td>
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<td>Bis(2-chloroethoxy)methane (111-91-1)</td>
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<tr>
<td>Bis(2-chloroethyl)ether (111-44-4)</td>
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<td>Bis(2-chloroisopropyl)ether (39638-32-9)</td>
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<td>Bis(2-ethylhexyl)phthalate (117-81-7)</td>
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<td>4-Bromophenyl phenyl ether (101-55-3)</td>
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<td>2-Chloronaphthalene (91-58-7)</td>
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<td>4-Chlorophenyl phenyl ether (7005-72-3)</td>
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<tr>
<td>Chrysene (218-01-9)</td>
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<tr>
<td>Dibenz[a,j]acridine (224-42-0)</td>
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<tr>
<td>Dibenz[a,h]acridine (226-36-8)</td>
<td>610M/625M</td>
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<td>Dibenz[a,j]anthracene (53-70-3)(^1)(^2) (1,2,5,6-dibenzanthracene)</td>
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<tr>
<td>Dibenz[a,e]pyrene (192-65-4)</td>
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<tr>
<td>Dibenz[a,h]pyrene (189-64-0)</td>
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<tr>
<td>3,3-Dichlorobenzidine (91-94-1)</td>
<td>605/625</td>
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<tr>
<td>Diethyl phthalate (84-66-2)</td>
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<tr>
<td>Dimethyl phthalate (131-11-3)</td>
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<td>Di-n-butyl phthalate (84-74-2)</td>
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<td>2,4-Dinitrotoluene (121-14-2)</td>
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<tr>
<td>2,6-Dinitrotoluene (606-20-2)</td>
<td>609/625</td>
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# PRIORITY POLLUTANTS (continued)

<table>
<thead>
<tr>
<th>Pollutant &amp; CAS No. (If available)</th>
<th>Recommended Analytical Protocol</th>
<th>Detection Level (DL)¹</th>
<th>Quantitation Level (QL)²</th>
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<tbody>
<tr>
<td><strong>BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)</strong></td>
<td></td>
<td>µg/L unless specified</td>
<td>µg/L unless specified</td>
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<tr>
<td>Di-n-octyl phthalate (117-84-0)</td>
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<td>1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)</td>
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<td>Fluoranthene (206-44-0)</td>
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<td>Fluorene (86-73-7)</td>
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<tr>
<td>Hexachlorobenzene (118-74-1)</td>
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<td>Hexachlorobutadiene (67-68-3)</td>
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<td>Hexachlorocyclopentadiene (77-47-4)</td>
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<td>Hexachloroethane (67-72-1)</td>
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<tr>
<td>Indeno(1,2,3-cd)Pyrene (193-39-5)</td>
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<td>Isophorone (78-59-1)</td>
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<td>3-Methyl cholanthrene (56-49-5)</td>
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<td>Naphthalene (91-20-3)</td>
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<td>N-Nitrosodimethylamine (82-75-9)</td>
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<td>N-Nitrosodi-n-propylamine (621-64-7)</td>
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<td>N-Nitrosodiphenylamine (89-30-6)</td>
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<td>Perylene (198-55-0)</td>
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<td>Phenanthrene (85-01-8)</td>
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<td>Pyrene (129-00-0)</td>
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<td>1,2,4-Trichlorobenzene (120-82-1)</td>
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<td><strong>DIOXIN</strong></td>
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<td>2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (176-40-16)</td>
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**PRIORITY POLLUTANTS (continued)**

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<th>Pollutant &amp; CAS No. (if available)</th>
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<th>Detection (DL) 1 µg/L, unless specified</th>
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<td>PESTICIDES/PCBs</td>
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<td>alpha-BHC (319-84-6)</td>
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<td>beta-BHC (319-85-7)</td>
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<td>gamma-BHC (68-83-9)</td>
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<td>delta-BHC (319-96-8)</td>
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<td>alpha-Endosulfan (959-98-8)</td>
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<td>beta-Endosulfan (33213-65-9)</td>
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<td>Endrin Aldehyde (7421-93-4)</td>
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<td>Heptachlor (76-44-8)</td>
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<td>Heptachlor Epoxide (1024-57-3)</td>
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<td>PCB-1242 (53469-21-9)</td>
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<td>PCB-1254 (11097-69-1)</td>
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<td>PCB-1280 (11098-62-5)</td>
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<td>Toxaphene (6001-35-2)</td>
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</table>

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).
3. **1, 3-dichloroproylene (mixed isomers)** You may report this parameter as two separate parameters: cis-1, 3-dichloropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).

4. **Total Benzo(a)fluoranthenes** - Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzo(a)fluoranthenes.

5. **Chlordane** - You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 0.025/0.050.

6. **PCB 1016 & PCB 1242** - You may report these two PCB compounds as one parameter called PCB 1016/1242.
Fact Sheet for NPDES Permit WA0020257
City of Anacortes Wastewater Treatment Plant
June 21, 2012

Purpose of this fact sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for the City of Anacortes Wastewater Treatment Plant (WWTP).

This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for the City of Anacortes Wastewater Treatment Plant (WWTP), NPDES permit WA0020257, were available for public review and comment from May 15, 2012, until June 14, 2012. For more details on preparing and filing comments about these documents, please see Appendix A – Public Involvement Information.

The City of Anacortes reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions regarding the facility’s location, history, wastewater discharges, or receiving water prior to publishing this draft fact sheet for public notice.

After the public comment period closes, Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as Appendix F – Response to Comments, and publish it when issuing the final NPDES permit. Ecology will not revise the rest of the fact sheet, but the full document will become part of the legal history contained in the facility’s permit file.

Summary

The City of Anacortes operates an activated sludge wastewater treatment plant that discharges to Guemes Channel. Ecology issued the previous permit for this facility on August 24, 2005, and modified it on July 1, 2006.

The proposed permit contains the same effluent limits for Carbonaceous Biological Oxygen Demand (CBOD$_3$), Total Suspended Solids, Fecal Coliform Bacteria, Chlorine, and pH as the permit modification issued in 2006. The proposed permit includes a new limit for Acute Whole Effluent Toxicity, revised conditions for combined sewer outfalls, and additional nutrient monitoring to support Puget Sound water quality studies. It does not include any other significant changes.
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I. Introduction

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the state of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The Legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington).

The following regulations apply to domestic wastewater NPDES permits:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC).
- Technical criteria for discharges from municipal wastewater treatment facilities (chapter 173-221 WAC).
- Water quality criteria for surface waters (chapter 173-201A WAC).
- Water quality criteria for ground waters (chapter 173-200 WAC).
- Whole effluent toxicity testing and limits (chapter 173-205 WAC).
- Sediment management standards (chapter 173-204 WAC).
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC).

The following additional regulations apply to communities operating collection systems with Combined Sewer Overflows:

- Submission of plans and reports for construction and operation of combined sewer overflow reduction facilities (chapter 173-245 WAC).
- US EPA CSO control policy (59 FR 18688).

These rules require any treatment facility owner/operator to obtain an NPDES permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for requirements imposed by the permit.

Under the NPDES permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make them available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days (WAC 173-220-050). (See Appendix A – Public Involvement Information for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft NPDES permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in Appendix F.
II. Background Information

Table 1. General facility information

<table>
<thead>
<tr>
<th>Facility Information</th>
<th>City of Anacortes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
<td>Anacortes Wastewater Treatment Plant</td>
</tr>
<tr>
<td>Facility Name and Address</td>
<td>500 T Avenue</td>
</tr>
<tr>
<td></td>
<td>Anacortes, WA 98221</td>
</tr>
<tr>
<td>Contact at Facility</td>
<td>John Franz, Plant Manager</td>
</tr>
<tr>
<td></td>
<td>360-299-0953</td>
</tr>
<tr>
<td>Responsible Official</td>
<td>H. Dean Maxwell, Mayor</td>
</tr>
<tr>
<td></td>
<td>P.O. Box 547</td>
</tr>
<tr>
<td></td>
<td>Anacortes, WA 98221</td>
</tr>
<tr>
<td></td>
<td>360-299-1950</td>
</tr>
<tr>
<td>Type of Treatment</td>
<td>Activated Sludge</td>
</tr>
<tr>
<td>Facility Location (NAD83/WGS84 reference datum)</td>
<td>Latitude: 48.518040;</td>
</tr>
<tr>
<td></td>
<td>Longitude: -122.606344</td>
</tr>
<tr>
<td>Discharge Waterbody Name and Location (NAD83/WGS84 reference datum)</td>
<td>Guemes Channel (Puget Sound)</td>
</tr>
<tr>
<td></td>
<td>Outfall 001</td>
</tr>
<tr>
<td></td>
<td>Latitude: 48.523056; Longitude: -122.608611</td>
</tr>
<tr>
<td></td>
<td>CSC 002</td>
</tr>
<tr>
<td></td>
<td>Latitude: 48.515278; Longitude: -122.634167</td>
</tr>
<tr>
<td></td>
<td>CSC 004</td>
</tr>
<tr>
<td></td>
<td>Latitude: 48.521667; Longitude: -122.609444</td>
</tr>
</tbody>
</table>

Permit Status

| Issuance Date of Previous Permit                          | August 24, 2005 |
| Modification Date                                         | July 1, 2006   |
| Application for Permit Renewal Submittal Date             | February 23, 2010 |
| Date of Ecology Acceptance of Application                 | August 19, 2010 |

Inspection Status

| Date of Last Sampling Inspection                          | February 21, 2012 |
| Date of Last Non-sampling Inspection                      | October 19, 2004  |
A. Facility description

The City of Anacortes wastewater treatment plant (WWTP) began operation in 1992. The treatment plant includes facilities for preliminary, primary, and secondary treatment, disinfection, and sludge handling. The facility includes a septage receiving station (holding tanks, grinder, and pump). During 2009 the Anacortes WWTP received an average of 2,698 gallons of septage per day. The liquid treatment system includes bar screens, grit removal, primary sedimentation, aeration basins, secondary clarifiers, chlorine disinfection and dechlorination. Figure 2 shows the treatment process schematic.

The treatment plant incorporates a bypass that diverts primary treated flows greater than 7.8 MGD around the aeration basins and secondary clarifiers. City of Anacortes constructed modifications in 2008 to correct excess diversions, as required by the previous NPDES permit.

Significant industrial/commercial discharges to the Anacortes WWTP include two seafood processors, Sugiyo USA and Trident Seafood Corporation. The Port of Anacortes discharges storm water into the sewer system, and the state ferry terminal discharges sewage pumped from its vessels.
Collection system status

The City of Anacortes' collection system dates back to the early 1900s. It includes 23 pump stations. Two combined sewer overflow (CSO) outfalls have the potential to discharge untreated sewage mixed with stormwater into Guemes Channel as a result of precipitation events. One of the CSO outfalls (004 - Q Avenue) had six discharge events during 1999-2010; the other CSO outfall (002 - B Avenue) had none during this time period. The City of Anacortes has permanently decommissioned a third CSO outfall (003 - M Avenue), which has had no discharges since 1997.

Solid wastes

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Waste activated sludge removed from the primary and secondary clarifiers is incinerated in a fluidized bed incinerator. The City of Anacortes disposes of the solid wastes and ash at the Klickitat County regional landfill. Figure 3 shows a diagram of the solids process.
WWTP outfall

The treated and disinfected effluent flows into Guemes Channel, on the west side of the Port of Anacortes Pier 2. The outfall diffuser is a pile-supported, 24-inch diameter concrete cylinder pipe, attached perpendicular to the end of the outfall pipe. The diffuser section is parallel to Guemes Channel, situated on the seabed grade at a depth of approximately 31 feet below mean lower low water (MLLW). The diffuser section is 52 feet long, with seven 6-inch ports spaced approximately 8.7 feet apart. All ports discharge laterally into the channel.

B. Description of the receiving water

The Anacortes WWTP discharges to Guemes Channel, part of Puget Sound. Guemes Channel is designated “excellent quality” marine water. Other nearby point source outfalls include Dakota Creek Industries (industrial stormwater and drydock flood water) and Tesoro Refining & Marketing Company. Significant nearby non-point sources of pollutants include municipal, industrial and construction stormwater, agricultural activities and forestry.

The ambient background data used for this permit comes from Ecology’s monitoring station FID001, located in Fidalgo Bay east of Anacortes. Ecology monitored this station between 1993 and 1997 (see http://www.ecy.wa.gov/apps/eap/marinewq/mwdataset.asp).

Table 2. Ambient background data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (highest measured 1-DMax)</td>
<td>15.6 °C</td>
</tr>
<tr>
<td>pH (maximum / minimum)</td>
<td>8.1 / 7.6 standard units</td>
</tr>
<tr>
<td>Dissolved Oxygen (10th percentile)</td>
<td>6.4 mg/L</td>
</tr>
<tr>
<td>Fecal Coliform (maximum)</td>
<td>5/100 mL</td>
</tr>
<tr>
<td>Salinity (10th percentile)</td>
<td>28.8 psu</td>
</tr>
</tbody>
</table>

C. Wastewater influent characterization

The City of Anacortes reported the concentration of influent pollutants in discharge monitoring reports. The influent wastewater is characterized in Table 3:

Table 3. Wastewater influent characterization

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Average Value</th>
<th>Maximum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD₅</td>
<td>mg/L</td>
<td>218</td>
<td>391</td>
</tr>
<tr>
<td>BOD₅</td>
<td>lbs/day</td>
<td>3,207</td>
<td>4,978</td>
</tr>
<tr>
<td>CBOD₅</td>
<td>mg/L</td>
<td>178</td>
<td>346</td>
</tr>
<tr>
<td>TSS</td>
<td>mg/L</td>
<td>243</td>
<td>708</td>
</tr>
<tr>
<td>TSS</td>
<td>lbs/day</td>
<td>3,576</td>
<td>11,803</td>
</tr>
</tbody>
</table>
D. Wastewater effluent characterization

The City of Anacortes reported the concentration of pollutants in the discharge in the permit application and in discharge monitoring reports. The tabulated data represents the quality of the wastewater effluent discharged from September 2005 through December 2011. The wastewater effluent is characterized as follows:

Table 4. Wastewater effluent characterization

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Average value</th>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>MGD</td>
<td>1.86</td>
<td>9.57</td>
</tr>
<tr>
<td>CBOD₅</td>
<td>mg/L</td>
<td>6.8</td>
<td>26.2</td>
</tr>
<tr>
<td>CBOD₅</td>
<td>lbs/day</td>
<td>106</td>
<td>517</td>
</tr>
<tr>
<td>CBOD₅ Removal</td>
<td>percent</td>
<td>96%</td>
<td>--</td>
</tr>
<tr>
<td>TSS</td>
<td>mg/L</td>
<td>8.4</td>
<td>26.6</td>
</tr>
<tr>
<td>TSS</td>
<td>lbs/day</td>
<td>137</td>
<td>848</td>
</tr>
<tr>
<td>TSS Removal</td>
<td>percent</td>
<td>96%</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Average monthly</th>
<th>Maximum 7-day geometric mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal Coliforms</td>
<td>#/100 ml</td>
<td>4.9</td>
<td>149</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Minimum value</th>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>standard units</td>
<td>6.4</td>
<td>8.6</td>
</tr>
<tr>
<td>Temperature</td>
<td>degrees Celsius</td>
<td>14.8°C (winter average)</td>
<td>21.2°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th># of samples</th>
<th>Average value</th>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine (Total Residual)</td>
<td>µg/L</td>
<td>&gt;300</td>
<td>57</td>
<td>360</td>
</tr>
<tr>
<td>Ammonia</td>
<td>mg/L</td>
<td>&gt;300</td>
<td>24.9</td>
<td>59.7</td>
</tr>
<tr>
<td>Dissolved oxygen</td>
<td>mg/L</td>
<td>&gt;300</td>
<td>4.6</td>
<td>9.5</td>
</tr>
<tr>
<td>Total Kjeldahl nitrogen (TKN)</td>
<td>mg/L</td>
<td>4</td>
<td>28</td>
<td>32.4</td>
</tr>
<tr>
<td>Nitrate plus nitrite nitrogen</td>
<td>mg/L</td>
<td>4</td>
<td>1.56</td>
<td>3.87</td>
</tr>
<tr>
<td>Oil and grease</td>
<td>mg/L</td>
<td>4</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Phosphorus (total)</td>
<td>mg/L</td>
<td>4</td>
<td>3.93</td>
<td>5.12</td>
</tr>
<tr>
<td>Total dissolved solids</td>
<td>mg/L</td>
<td>4</td>
<td>297</td>
<td>325</td>
</tr>
<tr>
<td>Arsenic</td>
<td>µg/L</td>
<td>15</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Cadmium</td>
<td>µg/L</td>
<td>15 (detected once)</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>µg/L</td>
<td>15</td>
<td>10.7</td>
<td>20</td>
</tr>
<tr>
<td>Nickel</td>
<td>µg/L</td>
<td>15</td>
<td>3.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Zinc</td>
<td>µg/L</td>
<td>15</td>
<td>37</td>
<td>70</td>
</tr>
<tr>
<td>Chloroform</td>
<td>µg/L</td>
<td>4</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>1,4-Dichlorobenzene</td>
<td>µg/L</td>
<td>4</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>µg/L</td>
<td>4</td>
<td>(detected once)</td>
<td>2.9</td>
</tr>
</tbody>
</table>
All other pollutants (including other metals, volatile organic compounds, acid-extractable compounds, and base-neutral compounds) tested for the permit application were not detected at measurable levels.

The City of Anacortes tested its effluent for acute and chronic toxicity in January 2008 and July 2008. The test results showed no chronic toxicity. Acute toxicity tests showed less than 65% survival in 100% effluent. The probable cause of toxicity was ammonia. Because of this acute toxicity test result, the proposed permit includes a limit and increased monitoring for acute toxicity (see section III.1 of this fact sheet).

E. Summary of compliance with previous permit issued August 24, 2005

The previous permit placed effluent limits on BOD₅ (prior to July 1, 2006), CBOD₅ (after July 1, 2006), TSS, fecal coliform bacteria, pH, and total residual chlorine.

The Anacortes WWTP has complied with the effluent limits and permit conditions throughout the duration of the permit issued on August 24, 2005 and modified on July 1, 2006, with one exception listed in Table 5 below. Ecology assessed compliance based on its review of the facility’s discharge monitoring reports (DMRs) and on inspections.

The following table summarizes the violations that occurred during the permit term.

Table 5. Violations

<table>
<thead>
<tr>
<th>Date</th>
<th>Parameter</th>
<th>Violation</th>
<th>Value</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/2006</td>
<td>BOD₅ percent removal</td>
<td>Numeric effluent violation</td>
<td>83</td>
<td>85 minimum</td>
</tr>
</tbody>
</table>

The following table summarizes compliance with report submittal requirements over the permit term.

Table 6. Permit submittals

<table>
<thead>
<tr>
<th>Submittal name</th>
<th>Due date/frequency</th>
<th>Compliance status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance schedule to correct excess bypass of secondary treatment</td>
<td>12/15/2008</td>
<td>Design and construction completed on time</td>
</tr>
<tr>
<td>Acute and chronic toxicity characterization test results</td>
<td>4/30/2008, 10/31/2008</td>
<td>Submitted on time</td>
</tr>
<tr>
<td>Chemical analysis of influent and effluent</td>
<td>1/quarter</td>
<td>Submitted on time</td>
</tr>
<tr>
<td>Combined sewer overflow report</td>
<td>1/year</td>
<td>Submitted on time</td>
</tr>
<tr>
<td>Combined sewer overflow reduction plan amendment</td>
<td>4/15/2007, 2/24/2010</td>
<td>Received by Ecology 4/16/2007 and 7/30/2010</td>
</tr>
</tbody>
</table>
F. State environmental policy act (SEPA) compliance

State law exempts reissuance or modification of any wastewater discharge permit from the SEPA process as long as the permit contains conditions are no less stringent than federal and state rules and regulations (RCW 43.21C.0383). The exemption applies only to existing discharges, not to new discharges.

III. Proposed Permit Limits

Federal and state regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC), or the National Toxics Rule (40 CFR 131.36).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application and from supporting reports (engineering, hydrogeology, etc.). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the state of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Ecology does not usually develop limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility’s effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent [40 CFR 122.42(a)]. Until Ecology modifies the permit to reflect additional discharge of pollutants, a permitted facility could be violating its permit.

A. Design criteria

Under WAC 173-220-150 (1)(g), flows and waste loadings must not exceed approved design criteria. Ecology approved design criteria for this facility’s treatment plant in the engineering report, Anacortes Wastewater Treatment Plant Capacity Evaluation dated April 1998, prepared by HDR Engineering, Inc. The table below includes design criteria from the referenced report.
Table 7. Design criteria for Anacortes WWTP

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Design Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum month design flow (MMDF)</td>
<td>4.5 MGD</td>
</tr>
<tr>
<td>BOD₅ loading for maximum month</td>
<td>6,400 lbs/day</td>
</tr>
<tr>
<td>TSS loading for maximum month</td>
<td>6,400 lbs/day</td>
</tr>
<tr>
<td>Peak flow to secondary treatment</td>
<td>7.8 MGD</td>
</tr>
<tr>
<td>Peak flow to primary treatment</td>
<td>9.6 MGD</td>
</tr>
</tbody>
</table>

B. Technology-based effluent limits

Federal and state regulations define technology-based effluent limits for municipal wastewater treatment plants. These effluent limits are given in 40 CFR Part 133 (federal) and in chapter 173-221 WAC (state). These regulations are performance standards that constitute all known, available, and reasonable methods of prevention, control, and treatment (AKART) for municipal wastewater. The federal CSO Control Policy (59 FR 18688) also requires entities with Combined Sewer Overflows to implement “Nine Minimum Controls” as technology-based performance standards for CSO discharges. Section V of this fact sheet includes more details on CSO requirements.

The facility owner/operator can request and Ecology can approve substitution of carbonaceous BOD₅ (CBOD₅) for the standard BOD₅ limitation. In such cases, Ecology may substitute a 25 mg/L CBOD₅ average monthly limit for a 30 mg/L BOD₅ average monthly limit. A 40 mg/L CBOD₅ average weekly limit may replace a 45 mg/L BOD₅ average weekly limit.

The table below identifies technology-based limits for pH, fecal coliform, CBOD₅, and TSS, as listed in chapter 173-221 WAC. The technology limits apply only to discharges of treated effluent from the wastewater treatment plant.

Table 8. Technology-based limits

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Average monthly limit</th>
<th>Average weekly limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBOD₅ (concentration)</td>
<td>25 mg/L</td>
<td>40 mg/L</td>
</tr>
<tr>
<td>CBOD₅ (concentration)</td>
<td>In addition, the CBOD₅ effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.</td>
<td></td>
</tr>
<tr>
<td>TSS (concentration)</td>
<td>30 mg/L</td>
<td>45 mg/L</td>
</tr>
<tr>
<td>TSS (concentration)</td>
<td>In addition, the TSS effluent concentration must not exceed fifteen percent (15%) of the average influent concentration.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Monthly geometric mean limit</th>
<th>Weekly geometric mean limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>200 organisms/100 ml</td>
<td>400 organisms/100 ml</td>
</tr>
</tbody>
</table>

Technology-based mass limits are based on WAC 173-220-130(3)(b), WAC 173-221-030(11)(b), WAC 173-220-130(1)(a) and (g), and WAC 173-221-040(1). Ecology calculated the monthly and weekly average mass limits for CBOD₅ as follows:
Mass Limit = CL x DF x CF

where:

- \( CL \) = Technology-based concentration limits listed in Table X.
- \( DF \) = Maximum Monthly Average Design flow (MGD)
- \( CF \) = Conversion factor of 8.34

Ecology calculated the monthly and weekly average mass limits for Total Suspended Solids as follows:

Average Monthly Mass Effluent Limit = Influent Mass Design Loading Criteria (lb/day) x 0.15

Average Weekly Mass Effluent Limit = 1.5 x Average Monthly Mass Effluent TSS Limit

### Table 9. Technology-based mass limits

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Concentration limit (mg/L)</th>
<th>Mass limit (lbs/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBOD(_5) monthly average</td>
<td>25</td>
<td>938</td>
</tr>
<tr>
<td>CBOD(_5) weekly average</td>
<td>40</td>
<td>1,501</td>
</tr>
<tr>
<td>TSS monthly average</td>
<td>30</td>
<td>960</td>
</tr>
<tr>
<td>TSS weekly average</td>
<td>45</td>
<td>1,440</td>
</tr>
</tbody>
</table>

### C. Surface water quality-based effluent limits

The Washington State surface water quality standards (chapter 173-201A WAC) are designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet the surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily load study (TMDL).

**Numerical criteria for the protection of aquatic life and recreation**

Numerical water quality criteria are listed in the water quality standards for surface waters (chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

**Numerical criteria for the protection of human health**

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (EPA, 1992). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other diseases,
based on consuming fish and shellfish and drinking contaminated surface waters. The water quality standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

**Narrative criteria**

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200, 2006) and of all marine waters (WAC 173-201A-210, 2006) in the state of Washington.

**Antidegradation**

**Description**—The purpose of Washington’s Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.
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Facility Specific Requirements—This facility must meet Tier I requirements.

- Dischargers must maintain and protect existing and designated uses. Ecology must not allow any degradation that will interfere with, or become injurious to, existing or designated uses, except as provided for in chapter 173-201A WAC.

Ecology’s analysis described in this section of the fact sheet demonstrates that the proposed permit conditions will protect existing and designated uses of the receiving water.

Mixing zones

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric standards, so long as the discharge doesn’t interfere with designated uses of the receiving water body (for example, recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric standards.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state’s water quality standards allow Ecology to authorize mixing zones for the facility’s permitted wastewater discharges only if those discharges already receive all known, available, and reasonable methods of prevention, control, and treatment (AKART). Mixing zones typically require compliance with water quality criteria within a specified distance from the point of discharge and must not use more than 25% of the available width of the water body for dilution [WAC 173-201A-400 (7)(a)(ii-iii)].

Ecology uses modeling to estimate the amount of mixing within the mixing zone. Through modeling Ecology determines the potential for violating the water quality standards at the edge of the mixing zone and derives any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology’s Permit Writer’s Manual). Each critical condition parameter, by itself, has a low probability of occurrence and the resulting dilution factor is conservative. The term “reasonable worst-case” applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 10 means the effluent is 10% and the receiving water is 90% of the total volume of water at the boundary of the mixing zone. Ecology uses dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life acute criterion is based on the assumption that organisms are not exposed to that concentration for more than one hour and more often than one exposure in three years.
Each aquatic life *chronic* criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two liters/day for drinking water.
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

1. **Ecology must specify both the allowed size and location in a permit.**
   The proposed permit specifies the size and location of the allowed mixing zone (as specified below).

2. **The facility must fully apply “all known, available, and reasonable methods of prevention, control and treatment” (AKART) to its discharge.**
   Ecology has determined that the treatment provided at the Anacortes WWTP meets the requirements of AKART (see “Technology-based Limits”).

3. **Ecology must consider critical discharge conditions.**
   Surface water quality-based limits are derived for the water body’s critical condition (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated waterbody uses). The critical discharge condition is often pollutant-specific or waterbody-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents, and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology uses the water depth at mean lower low water (MLLW) for marine waters. *Ecology’s Permit Writer’s Manual* describes additional guidance on criteria/design conditions for determining dilution factors. The manual can be obtained from Ecology’s website at: [http://www.ecy.wa.gov/biblio/92109.html](http://www.ecy.wa.gov/biblio/92109.html).
<table>
<thead>
<tr>
<th>Critical Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water depth at MLLW</td>
<td>31 ft (9.4 m)</td>
</tr>
<tr>
<td>Density profile</td>
<td>Maximum and minimum stratification measured near the outfall</td>
</tr>
<tr>
<td>10th percentile current speed</td>
<td>0.167 ft/s (5.1 cm/sec)</td>
</tr>
<tr>
<td>Effluent flow rates</td>
<td>Range of projected average and maximum flows from 2.58-12 MGD</td>
</tr>
</tbody>
</table>

Ecology obtained ambient data at critical conditions in the vicinity of the outfall from the Outfall Dilution Study Report (January 1996) and Addendum to the Outfall Dilution Study Report (November 7, 1996), prepared by CH2M Hill.

4. **Supporting information must clearly indicate the mixing zone would not:**
   - Have a reasonable potential to cause the loss of sensitive or important habitat.
   - Substantially interfere with the existing or characteristic uses.
   - Result in damage to the ecosystem.
   - Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms and set the criteria to generally protect the species tested and to fully protect all commercially and recreationally important species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for one hour. They set chronic standards assuming organisms are exposed to the pollutant at the criteria concentration for four days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of discharge.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that the effluent will not exceed 33 degrees C for more than two seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics, and the discharge location. Based on this review, Ecology concluded that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristic uses, result in damage to the ecosystem, or adversely affect public health if the permit limits are met.
5. **The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.**

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant and concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone if permit limits are met.

6. **The size of the mixing zone and the concentrations of the pollutants must be minimized.**

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. Because tidal currents change direction, the plume orientation within the mixing zone changes. The plume mixes as it rises through the water column therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving waterbody. When a diffuser is installed, the discharge is more completely mixed with the receiving water in a shorter time. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95th percentile pollutant concentration, the 90th percentile background concentration, the centerline dilution factor, and the lowest flow occurring once in every ten years to perform the reasonable potential analysis.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

7. **Maximum size of mixing zone.**

The authorized mixing zone does not exceed the maximum size restriction.

8. **Acute mixing zone.**

- **The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.**

Ecology determined the acute criteria will be met at 10% of the distance of the chronic mixing zone.

- **The pollutant concentration, duration, and frequency of exposure to the discharge will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.**

As described above, the toxicity of any pollutant depends upon the exposure, the pollutant concentration, and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organisms near the point of discharge (below the rising effluent).
• Comply with size restrictions.

The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.


This mixing zone does not overlap another mixing zone.

D. Designated uses and surface water quality criteria

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (EPA 1992). The tables included below summarize the criteria applicable to the receiving water’s designated uses.

The Aquatic Life Uses and the associated criteria for this receiving water are identified below.

Table 10. Marine aquatic life uses and associated criteria

<table>
<thead>
<tr>
<th>Excellent Quality: Salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning, crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.); rearing and spawning.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Criteria – Highest 1D MAX</td>
</tr>
<tr>
<td>Dissolved Oxygen Criteria – Lowest 1-Day Minimum</td>
</tr>
</tbody>
</table>
| Turbidity Criteria                                           | • 5 NTU over background when the background is 50 NTU or less; or
|                                                             | • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU. |
| pH Criteria                                                  | pH must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units. |

To protect Shellfish Harvesting and Primary Contact Recreation Uses: Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.

The Miscellaneous Marine Water Uses are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

E. Water quality impairments

The water body “Padilla Bay, Fidalgo Bay, and Guemes Channel” is listed on the 2008 303(d) and is impaired for fecal coliform (water), benzo[a]anthracene (tissue), and chrysene (tissue). The data Ecology used as the basis for the listings did not come from the nearby vicinity of the Anacortes WWTP outfall. For further information on the 303(d) Water Quality Assessment, see http://www.ecy.wa.gov/programs/wq/303d/index.html.
F. Evaluation of surface water quality-based effluent limits for numeric criteria

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). Toxic pollutants, for example, are near-field pollutants; their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biochemical oxygen demand (BOD₅) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

With technology-based controls (AKART), predicted pollutant concentrations in the discharge exceed water quality criteria. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones by chapter 173-201A WAC.

The diffuser at Outfall 001 is 52 feet long with a diameter of 24 inches. The diffuser has a total of seven 6-inch diameter ports. The distance between ports is 8.7 feet. The diffuser depth is 31 feet (MLLW). Ecology obtained this information from the Outfall Dilution Study Report (January, 1996) and Addendum to the Outfall Dilution Study Report (November 7, 1996), prepared by CH2M Hill.

**Chronic Mixing Zone**—WAC 173-201A-400(7)(b) specifies that mixing zones must not extend in any horizontal direction from the discharge ports for a distance greater than 200 feet plus the depth of water over the discharge ports and may not occupy more than 25% of the width of the water body as measured during MLLW.

The horizontal distance of the chronic mixing zone is 231 feet. The mixing zone extends from the top of the discharge ports to the water surface.

**Acute Mixing Zone**—WAC 173-201A-400(8)(b) specifies that in estuarine waters a zone where acute criteria may be exceeded must not extend beyond 10% of the distance established for the chronic zone. The acute mixing zone for Outfall 001 extends 23.1 feet in any direction from any discharge port.
The dilution study used fluorescent dye and field measurements along with the model UDHKDEN to estimate dilution factors for a range of effluent flows. Ecology selected the dilution factors that occur within these zones at the critical conditions using the approved design flow of 4.5 MGD. The dilution factors are listed below.

Table 11. Dilution factors (DF)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Acute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Life</td>
<td>38</td>
<td>72</td>
</tr>
<tr>
<td>Human Health, Carcinogen</td>
<td></td>
<td>72*</td>
</tr>
<tr>
<td>Human Health, Non-carcinogen</td>
<td></td>
<td>72*</td>
</tr>
</tbody>
</table>

*Not specifically modeled, chronic aquatic life dilution factor used by default.

Ecology determined the impacts of dissolved oxygen deficiency, pH, fecal coliform, chlorine, ammonia, metals, other toxics, and temperature as described below, using the dilution factors in the above table. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

Dissolved Oxygen—BOD₅ and Ammonia Effects—Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The 5-day Biochemical Oxygen Demand (BOD₅) of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water. The amount of ammonia-based nitrogen in the wastewater also provides an indication of oxygen demand potential in the receiving water.
With technology-based limits, this discharge results in a small amount of biochemical oxygen demand \((\text{BOD}^3_s)\) relative to the large amount of dilution in the receiving water at critical conditions. Technology-based limits will ensure that dissolved oxygen criteria are met in the receiving water.

**pH**—Compliance with the technology-based limits of 6.0 to 9.0 will assure compliance with the water quality standards of surface waters because of the high buffering capacity of marine water.

**Fecal Coliform**—Ecology modeled the numbers of fecal coliform by simple mixing analysis using the technology-based limit of 400 organisms per 100 mL, an ambient fecal coliform concentration of 5 organisms per 100 mL, and a dilution factor of 72 (see Appendix E).

Under critical conditions, modeling predicts no violation of the water quality criterion for fecal coliform. Therefore, the proposed permit includes the technology-based effluent limit for fecal coliform bacteria.

**Turbidity**—Domestic wastewater dischargers do not routinely measure turbidity. Ecology expects no violations of the turbidity criteria outside the designated mixing zone provided the facility meets its technology-based total suspended solids permit limits.

**Toxic Pollutants**—Federal regulations (40 CFR 122.44) require Ecology to place limits in NPDES permits on toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. Ecology does not exempt facilities with technology-based effluent limits from meeting the surface water quality standards.

The toxic pollutants listed in Table 12 are present in the discharge. Ecology conducted a reasonable potential analysis (See Appendix E) on these parameters to determine whether it would require effluent limits in this permit.

### Table 12. Toxic pollutants for reasonable potential evaluation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th># of samples</th>
<th>Average value</th>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine (Total Residual)</td>
<td>µg/L</td>
<td>&gt;300</td>
<td>57</td>
<td>360</td>
</tr>
<tr>
<td>Ammonia</td>
<td>mg/L</td>
<td>&gt;300</td>
<td>24.9</td>
<td>59.7</td>
</tr>
<tr>
<td>Arsenic</td>
<td>µg/L</td>
<td>15</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Cadmium</td>
<td>µg/L</td>
<td>15</td>
<td>(only detected once)</td>
<td>0.5</td>
</tr>
<tr>
<td>Copper</td>
<td>µg/L</td>
<td>15</td>
<td>10.7</td>
<td>20</td>
</tr>
<tr>
<td>Nickel</td>
<td>µg/L</td>
<td>15</td>
<td>3.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Zinc</td>
<td>µg/L</td>
<td>15</td>
<td>37</td>
<td>70</td>
</tr>
</tbody>
</table>

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature, pH, and salinity of the receiving marine water. To evaluate ammonia toxicity, Ecology used the available receiving water information for ambient station FID001 and Ecology spreadsheet tools.

No valid ambient background data were available for the listed pollutants. Ecology used zero for background.
Ecology determined that the toxic pollutants listed in Table 12 (except chlorine) pose no reasonable potential to exceed the water quality criteria at the critical condition using procedures given in EPA, 1991 (Appendix E) and as described above. Ecology's determination assumes that this facility meets the other effluent limits of this permit.

Ecology derived effluent limits for the toxic pollutant chlorine, because at the technology-based limit of 0.75 mg/L it has a reasonable potential to cause a violation of the water quality standards. Ecology calculated effluent limits using methods from EPA, 1991 as shown in Appendix E.

The effluent limits for total chlorine residual are as follows:
• Average Monthly Limit – 189 µg/L
• Maximum Daily Limit – 494 µg/L

Temperature—The state temperature standards [WAC 173-201A-200-210 and 600-612] include multiple elements:
• Annual summer maximum threshold criteria (June 15 to September 15).
• Supplemental spawning and rearing season criteria (September 15 to June 15).
• Incremental warming restrictions.
• Protections against acute effects.

Ecology evaluates each criterion independently to determine reasonable potential and derive permit limits.
• Annual summer maximum and supplementary spawning/rearing criteria.

Each water body has an annual maximum temperature criterion [WAC 173-201A-200(1)(c), 210(1)(c), and Table 602]. These threshold criteria (e.g., 12, 16, 17.5, 20°C) protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures.

Some waters have an additional threshold criterion to protect the spawning and incubation of salmonids (9°C for char and 13°C for salmon and trout) [WAC 173-201A-602, Table 602]. These criteria apply during specific date-windows.

The threshold criteria apply at the edge of the chronic mixing zone. Criteria for most fresh waters are expressed as the highest 7-Day average of daily maximum temperature (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. Criteria for marine waters and some fresh waters are expressed as the highest 1-Day annual maximum temperature (1-DMax).

• Incremental warming criteria

The water quality standards limit the amount of warming human sources can cause under specific situations [WAC 173-201A-200(1)(c)(i)-(ii), 210(1)(c)(i)-(ii)]. The incremental warming criteria apply at the edge of the chronic mixing zone.

At locations and times when background temperatures are cooler than the assigned threshold criterion, point sources are permitted to warm the water by only a defined increment. These increments are permitted only to the extent doing so does not cause temperatures to exceed either the annual maximum or supplemental spawning criteria.
At locations and times when a threshold criterion is being exceeded due to natural
conditions, all human sources, considered cumulatively, must not warm the water more
than 0.3°C above the naturally warm condition.

When Ecology has not yet completed a TMDL, our policy allows each point source to
warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of
the background temperature and even if doing so would cause the temperature at the edge
of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C
warming for each point source is reasonable and protective where the dilution factor is
based on 25% or less of the critical flow. This is because the fully mixed effect on
temperature will only be a fraction of the 0.3°C cumulative allowance (0.075°C or less)
for all human sources combined.

- Protections for temperature acute effects
  Instantaneous lethality to passing fish: The upper 99th percentile daily maximum effluent
temperature must not exceed 33°C, unless a dilution analysis indicates ambient
temperatures will not exceed 33°C two seconds after discharge.
  General lethality and migration blockage: Measurable (0.3°C) increases in temperature at
the edge of a chronic mixing zone are not allowed when the receiving water temperature
exceeds either a 1DMax of 23°C or a 7DADMax of 22°C.
  Lethality to incubating fish: Human actions must not cause a measurable (0.3°C)
warming above 17.5°C at locations where eggs are incubating.

Reasonable Potential Analysis

Annual summer maximum and incremental warming criteria: Ecology evaluated the
reasonable potential for the discharge to exceed the annual summer maximum and the
incremental warming criteria at the edge of the chronic mixing zone during critical
conditions. No reasonable potential exists to exceed the temperature criterion when the
effluent temperature and dilution factor are outside the shaded area in Figure 5.
The water quality criterion for temperature in Guemes Channel is 16°C (dark green area in the chart above). The 95th percentile effluent temperature is 21.2°C (x-axis above). The chronic dilution factor at the mixing zone boundary is 72 (y-axis above). Based on these parameters and the above graph, no reasonable potential exists to exceed the numeric WQ criterion for temperature.

Therefore, the proposed permit does not include a temperature limit. Ecology will reevaluate the reasonable potential during the next permit renewal.

G. Human health

Washington’s water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

Ecology determined the effluent contains chemicals of concern for human health, based on the facility’s status as an EPA major discharger, and data or information reported in priority pollutant testing that indicate regulated chemicals occur in the discharge.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th># of samples</th>
<th>Average value</th>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel</td>
<td>µg/L</td>
<td>15</td>
<td>3.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Chloroform</td>
<td>µg/L</td>
<td>4</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>1,4-Dichlorobenzene</td>
<td>µg/L</td>
<td>4</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Tetrachloroethylene</td>
<td>µg/L</td>
<td>4 (only detected once)</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>µg/L</td>
<td>4</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Bis(2-ethylhexyl) phthalate</td>
<td>µg/L</td>
<td>4</td>
<td>0.2</td>
<td>13.6</td>
</tr>
</tbody>
</table>
Ecology evaluated the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d) by following the procedures published in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and Ecology's Permit Writer's Manual to make a reasonable potential determination (Appendix E). The evaluation showed that the discharge has no reasonable potential to cause a violation of water quality standards, and an effluent limit is not needed.

H. Sediment quality

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health. Under these standards Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website. http://www.ecy.wa.gov/programs/tcp/smu/sediment.html

In 2007, Ecology collected four sediment samples near the Anacortes WWTP outfall and analyzed them for the 47 chemicals with numeric standards in the sediment management standards. None of the detected concentrations were in violation of the numeric standards for sediment. However, other studies show that there are sediment concentrations that violate the standard in the Dakota Creek Industries basin near the outfall, where there are multiple discharges into the site.

The Port of Anacortes and Dakota Creek Industries have a sediment cleanup planned for this site. Additional sediment monitoring will be done after the cleanup is completed.

I. Whole effluent toxicity

The water quality standards for surface waters forbid discharge of effluent that has the potential to cause toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

- **Acute toxicity tests measure mortality as the significant response** to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.

- **Chronic toxicity tests measure various sublethal toxic responses**, such as reduced growth or reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Laboratories accredited by Ecology for WET testing know how to use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know about WET testing and how to calculate an NOEC, LC50, EC50, IC25, etc. Ecology gives all accredited labs the most recent version of Ecology Publication No. WQ-R-95-80, Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria (http://www.ecy.wa.gov/biblio/9580.html), which is referenced in the permit. Ecology recommends that the City of Anacortes send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.
WET testing conducted during the previous permit term showed the facility’s effluent has a reasonable potential to cause acute toxicity in the receiving water. The proposed permit will include an acute toxicity limit. **The effluent limit for acute toxicity is: No acute toxicity detected in a test sample representing the acute critical effluent concentration (ACEC).** The acute critical effluent concentration (ACEC) is the concentration of effluent at the boundary of the acute mixing zone during critical conditions. The ACEC equals 2.6% effluent.

Compliance with an acute toxicity limit is measured by an acute toxicity test comparing test organism survival in the ACEC (using a sample of effluent diluted to equal the ACEC) to survival in nontoxic control water. The City of Anacortes is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC sample and the control sample.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water chronic toxicity. The proposed permit will not include a chronic WET limit. The City of Anacortes must retest the effluent before submitting an application for permit renewal.

- If this facility makes process or material changes which, in Ecology’s opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization
- If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased. The City of Anacortes may demonstrate to Ecology that effluent toxicity has not increased by performing additional WET testing after the process or material changes have been made.

**J. Ground water quality limits**

The ground water quality standards (chapter 173-200 WAC) protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards (WAC 173-200-100).

The City of Anacortes does not discharge wastewater to the ground. No permit limits are required to protect ground water.

**K. Comparison of effluent limits with the previous permit as modified on July 1, 2006**

**Table 14. Comparison of previous and proposed effluent limits**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Basis of limit</th>
<th>Previous effluent limits: Outfall # 001</th>
<th>Proposed effluent limits: Outfall # 001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonaceous Technology</td>
<td></td>
<td>25 mg/L 938 lbs/day</td>
<td>40 mg/L 1,501 lbs/day</td>
</tr>
<tr>
<td>Biochemical Oxygen Demand (5-day) Technology</td>
<td></td>
<td>30 mg/L 1,126 lbs/day</td>
<td>45 mg/L 1,889 lbs/day</td>
</tr>
</tbody>
</table>
### IV. Monitoring Requirements

Ecology requires monitoring, recording, and reporting (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit’s effluent limits.

#### A. Lab accreditation

Ecology requires that facilities must use a laboratory registered or accredited under the provisions of chapter 173-50 WAC, Accreditation of Environmental Laboratories, to prepare all monitoring data (with the exception of certain parameters). Ecology accredited the laboratory at this facility for: ammonia, BOD, CBOD, dissolved oxygen, pH, TSS, and total residual chlorine.

#### B. Wastewater monitoring

The monitoring schedule is detailed in the proposed permit under Special Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology’s Permit Writer’s Manual (Publication Number 92-09) for an activated sludge treatment plant with average design flow of 2.0-5.0 MGD.

Ecology has included some additional monitoring of nutrients in the proposed permit to establish a baseline for this discharger. It will use this data in the future as it develops TMDLs for dissolved oxygen and establishes WLAs for nutrients.

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

A. Reporting and record keeping

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and record keeping requirements to prevent and control waste discharges (WAC 173-220-210).

B. Prevention of facility overloading

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the City of Anacortes to:

- Take the actions detailed in proposed permit Special Condition S.4.
- Plant expansions or modifications before the treatment plant reaches existing capacity.
- Report and correct conditions that could result in new or increased discharges of pollutants.

Special Condition S.4 restricts the amount of flow.

C. Operation and maintenance

The proposed permit contains Special Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, chapter 173-230 WAC, and WAC 173-240-080. Ecology included it to ensure proper operation and regular maintenance of equipment, and to ensure that the City of Anacortes takes adequate safeguards so that it uses constructed facilities to their optimum potential in terms of pollutant capture and treatment.

D. Pretreatment

Duty to enforce discharge prohibitions

This provision prohibits the publicly owned treatment works (POTW) from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer.

- The first section of the pretreatment requirements prohibits the POTW from accepting pollutants which causes “pass-through” or “interference.” This general prohibition is from 40 CFR §403.5(a). Appendix C of this fact sheet defines these terms.
- The second section reinforces a number of specific state and federal pretreatment prohibitions found in WAC 173-216-060 and 40 CFR §403.5(b). These reinforce that the POTW may not accept certain wastes, which:
  a. Are prohibited due to dangerous waste rules.
  b. Are explosive or flammable.
  c. Have too high or low of a pH (too corrosive, acidic or basic).
  d. May cause a blockage such as grease, sand, rocks, or viscous materials.
  e. Are hot enough to cause a problem.
  f. Are of sufficient strength or volume to interfere with treatment.
g. Contain too much petroleum-based oils, mineral oil, or cutting fluid.

h. Create noxious or toxic gases at any point.

40 CFR Part 403 contains the regulatory basis for these prohibitions, with the exception of the pH provisions which are based on WAC 173-216-060.

- The third section of pretreatment conditions reflects state prohibitions on the POTW accepting certain types of discharges unless the discharge has received prior written authorization from Ecology. These discharges include:
  a. Cooling water in significant volumes.
  b. Stormwater and other direct inflow sources.
  c. Wastewaters significantly affecting system hydraulic loading, which do not require treatment.

**Federal and state pretreatment program requirements**

Ecology administers the Pretreatment Program under the terms of the addendum to the “Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10” (1986) and 40 CFR, part 403. Under this delegation of authority, Ecology issues wastewater discharge permits for significant industrial users (SIUs) discharging to POTWs which have not been delegated authority to issue wastewater discharge permits. Ecology must approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i) and(iii)].

Industrial dischargers must obtain a permit from Ecology before discharging waste to the Anacortes WWTP [WAC 173-216-110(5)]. Industries discharging wastewater that is similar in character to domestic wastewater do not require a permit.

**Routine identification and reporting of industrial users**

The permit requires non-delegated POTWs to take “continuous, routine measures to identify all existing, new, and proposed significant industrial users (SIUs) and potential significant industrial users (PSIUs)” discharging to their sewer system. Examples of such routine measures include regular review of water and sewer billing records, business license and building permit applications, advertisements, and personal reconnaissance. System maintenance personnel should be trained on what to look for so they can identify and report new industrial dischargers in the course of performing their jobs. The POTW may not allow SIUs to discharge prior to receiving a permit, and must notify all industrial dischargers (significant or not) in writing of their responsibility to apply for a State Waste Discharge Permit. The POTW must send a copy of this notification to Ecology.

**Industrial user survey update**

This provision requires the POTW to submit an updated list of existing and proposed significant industrial users (SIUs) and potential significant industrial users (PSIUs). This provides Ecology with notice of any new or proposed industrial users in the POTW's service area. This level of effort is often sufficient for small municipalities which have not seen any adverse effects potentially attributable to industries, have loadings commensurate with domestic flows, and have a small proportion of industrial flow.
E. Solid wastes

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

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under chapter 70.95J RCW, chapter 173-308 WAC “Biosolids Management,” and chapter 173-350 WAC “Solid Waste Handling Standards.” The disposal of other solid waste is under the jurisdiction of the Skagit County Health Department.

F. Combined sewer overflows

Chapter 173-245 WAC requires that “All CSO sites shall achieve and at least maintain the greatest reasonable reduction, and neither cause violations of applicable water quality standards, nor restrictions to the characteristic uses of the receiving water, nor accumulation of deposits which: (a) exceed sediment criteria or standards; or (b) have an adverse biological effect.” “The greatest reasonable reduction” means control of each CSO outfall such that an average of no more than one untreated discharge may occur per year. Ecology includes specific conditions in the proposed permit to ensure that the City of Anacortes continues to meet the state’s CSO rule and water quality standards for each CSO outfall in its system.

Ecology requires municipalities to develop combined sewer overflow (CSO) reduction plans in chapter 173-245 WAC. These plans are substantially equivalent to the long-term control plan (LTCP) as defined by EPA in its CSO control policy (59 FR 18688). Ecology originally approved the City of Anacortes’s CSO reduction plan in 1990. In 1990, the City of Anacortes had three combined sewer overflow outfalls. Since 1990, the City has controlled all three CSO outfalls. Specifically, Outfall #003 was eliminated, Outfall #002 had no discharges from 1999-2010, and Outfall #004 which had six discharges from 1999-2010, or approximately 0.5/year.

Table 15. CSO frequency

<table>
<thead>
<tr>
<th>Year</th>
<th>002 B Avenue CSO Events</th>
<th>003 M Avenue CSO Events</th>
<th>004 Q Avenue CSO Events</th>
<th>Volume Discharged (gallons)</th>
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</thead>
<tbody>
<tr>
<td>2010</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>128,887</td>
</tr>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>98,704</td>
</tr>
<tr>
<td>2008</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>38,212</td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>2003</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>648</td>
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<td></td>
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<td>0</td>
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<tr>
<td>1999</td>
<td>0</td>
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The proposed permit requires the City of Anacortes to meet the requirements of WAC 173-245 and EPA’s CSO control policy as follows:

- Monitor the volume, duration and precipitation associated with each CSO discharge event at each identified outfall.
- Continue to implement the “nine minimum controls” as technology-based standards for CSO discharges. The nine minimum controls are largely programmatic policies and practices designed to minimize the impacts untreated CSOs have on human health and the environment.
- Submit annual reports according to the requirements of WAC 173-245-090(1). The reports must document CSO monitoring, implementation of the nine minimum controls, and wet weather operation (flow blending) at the treatment plant.
- Ecology will assess compliance with the state standard of one untreated discharge per year per CSO by using a moving averaging period of 5 years (the past 4 years and the current year of CSO discharge data). Ecology will assess compliance annually.
- Because all CSOs are controlled to the state standard of one untreated discharge per year per CSO, the City of Anacortes is not required to submit an amendment to the CSO reduction plan as described in WAC 173-245-090(2) for this permit term.
- Develop a post construction compliance monitoring program adequate to verify compliance with water quality-based requirements and ascertain the effectiveness of CSO controls. The on-going monitoring for CSO frequency and volume will help supplement information required in the post-construction monitoring plan.

G. Wet weather operation

The Anacortes WWTP has a larger primary treatment capacity than secondary treatment capacity. The design flow through the influent pump station, headworks, primary clarifiers, chlorine contact basin, and outfall is 9.6 MGD. Design peak flow for secondary treatment is 7.8 MGD. The proposed permit authorizes bypass of the secondary treatment portion of the Anacortes WWTP only when the instantaneous flow rate to the WWTP exceeds 7.8 MGD as a result of precipitation events. The bypass flows receive primary treatment, and are mixed with the secondary treated effluent before disinfection and final discharge. The mixed final effluent must meet the permit limits at all times. The City of Anacortes must report CSO-related bypass events in the monthly discharge monitoring reports and in the annual CSO report.

One effective strategy to abate pollution resulting from CSOs is to maximize the delivery of flows during wet weather to the treatment plant. This practice is consistent with EPA’s Nine Minimum Control #4, eliminates or minimizes overflows, and it provides at least primary treatment to combined sewer flows. Under EPA regulations, the intentional diversion of waste streams from any portion of a treatment facility, including secondary treatment, is a bypass. A bypass is allowed only under specific limited circumstances. EPA’s Combined Sewer Overflow Guidance for Permit Writers states that a CSO-related bypass at a wastewater treatment plant can only occur if there is no feasible alternative. The no feasible alternative analysis requirement can be met if the record demonstrates that the secondary treatment system is properly operated and maintained, that the system has been designed to meet secondary limits for flows greater than the peak dry weather
flow plus an appropriate wet weather flow, and that it is either technically or financially infeasible to provide secondary treatment for greater amounts of flow.

- Inspections and monitoring records demonstrate that the secondary treatment system is properly operated and maintained.

- The City of Anacortes completed planning, design, and construction of secondary treatment and CSO correction in an integrated fashion between 1987 and 1992. Sewer separation projects reduced inflow substantially prior to construction of the secondary treatment facility. The system is designed for a maximum average monthly flow of 4.5 MGD. Peak flows up to 7.8 MGD are treated in the secondary aeration basins and clarifiers; the primary treatment system and outfall can handle peak flows up to 9.6 MGD. Since the WWTP has been designed to treat flows to meet secondary limits and well in excess of the future maximum monthly average flow, the WWTP meets the criteria for treating the peak dry weather flow plus an appropriate amount of wet weather flow. Flows higher than 7.8 MGD to the secondary treatment units would cause substantial physical damage by washing out the biological system. The quality of the blended effluent meets all permit limits based on secondary treatment technology.

- The administrative record includes extensive documentation of the engineering decisions, cost-effectiveness analyses, and environmental impacts review done during the design phase, as these projects were financially supported by the state and federal agencies.

- The City of Anacortes is continuing to implement projects to improve the capacity of the collection system and to reduce inflow and CSOs, as documented in the City’s 2011-2016 Capital Facilities Plan. At this time, it is not technically or financially feasible to provide additional secondary treatment for peak wet weather flows at the treatment plant.

H. Outfall evaluation

The proposed permit requires the City of Anacortes to conduct an outfall inspection and submit a report detailing the findings of that inspection (Special Condition S.11). The inspection must evaluate the physical condition of the discharge pipe and diffusers, and evaluate the extent of sediment accumulations in the vicinity of the outfall.

I. General conditions

Ecology bases the standardized General Conditions on state and federal law and regulations. They are included in all individual domestic wastewater NPDES permits issued by Ecology.

VI. Permit Issuance Procedures

A. Permit modifications

Ecology may modify this permit to impose numerical limits, if necessary to comply with water quality standards for surface waters, with sediment quality standards, or with water quality standards for ground waters, based on new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.
Ecology may also modify this permit to comply with new or amended state or federal regulations.

B. Proposed permit issuance

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of 5 years.

VII. References for Text and Appendices

Environmental Protection Agency (EPA)


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


Washington State Department of Ecology.


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

Water Pollution Control Federation.


Appendix A – Public Involvement Information

Ecology proposes to reissue a permit to the City of Anacortes Wastewater Treatment Plant. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology’s reasons for requiring permit conditions.

Ecology placed a Public Notice of Application on August 22, 2010, and August 27, 2010, in Skagit Publishing to inform the public about the submitted application and to invite comment on the reissuance of this permit.

Ecology placed a Public Notice of Draft on May 15, 2012, in the Skagit Valley Herald to inform the public and to invite comment on the proposed draft National Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Told where copies of the draft permit and fact sheet were available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offered to provide the documents in an alternate format to accommodate special needs.
- Asked people to tell us how well the proposed permit would protect the receiving water.
- Invited people to suggest fairer conditions, limits, and requirements for the permit.
- Invited comments on Ecology’s determination of compliance with antidegradation rules.
- Urged people to submit their comments, in writing, before the end of the comment period.
- Told how to request a public hearing about the proposed NPDES permit.
- Explained the next step(s) in the permitting process.

Ecology has published a document entitled Frequently Asked Questions about Effective Public Commenting, which is available on our website at http://www.ecy.wa.gov/biblio/0307023.html.

You may obtain further information from Ecology by telephone, 425-649-7201, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

The primary author of this permit and fact sheet is Laura Fricke, P.E.
Appendix B – Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. “Date of receipt” is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

<table>
<thead>
<tr>
<th>Street Addresses</th>
<th>Mailing Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Department of Ecology</strong></td>
<td><strong>Department of Ecology</strong></td>
</tr>
<tr>
<td>Attn: Appeals Processing Desk</td>
<td>Attn: Appeals Processing Desk</td>
</tr>
<tr>
<td>300 Desmond Drive SE</td>
<td>PO Box 47608</td>
</tr>
<tr>
<td>Lacey, WA 98503</td>
<td>Olympia, WA 98504-7608</td>
</tr>
<tr>
<td><strong>Pollution Control Hearings Board</strong></td>
<td><strong>Pollution Control Hearings Board</strong></td>
</tr>
<tr>
<td>1111 Israel RD SW</td>
<td>PO Box 40903</td>
</tr>
<tr>
<td>STE 301</td>
<td>Olympia, WA 98504-0903</td>
</tr>
<tr>
<td>Tumwater, WA 98501</td>
<td></td>
</tr>
</tbody>
</table>
Appendix C - Glossary

1-DMax or 1-day maximum temperature -- The highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or continuous monitoring probes having sampling intervals of thirty minutes or less.

7-DADMax or 7-day average of the daily maximum temperatures -- The arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.

Acute toxicity -- The lethal effect of a compound on an organism that occurs in a short time period, usually 48 to 96 hours.

AKART -- The acronym for “all known, available, and reasonable methods of prevention, control and treatment.” AKART is a technology-based approach to limiting pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance -- An alternative location in the ground water from the point of compliance where compliance with the ground water standards is measured. It may be established in the ground water at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An “early warning value” must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

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

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

Annual average design flow (AADF) -- Average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly discharge limit -- The average of the measured values obtained over a calendar month’s time.

Background water quality -- The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of ground water at a particular point in time upgradient of an activity that has not been affected by that activity [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

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

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

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

**Categorical pretreatment standards** -- National pretreatment standards specifying quantities or concentrations of pollutants or pollutant properties, which may be discharged to a POTW by existing or new industrial users in specific industrial subcategories.

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

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

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

**Compliance inspection-without sampling** -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance inspection-with sampling** -- A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Ecology may conduct additional sampling.

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

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

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

**Date of receipt** -- This is defined in RCW 43.21B.001(2) as five business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

**Detection limit** -- See Method Detection Level.

**Dilution factor (DF)** -- A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, for example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Distribution uniformity** -- The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

**Early warning value** -- The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, ground water, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

**Enforcement limit** -- The concentration assigned to a contaminant in the ground water at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a ground water criterion will not be exceeded and that background water quality will be protected.

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

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

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

**Ground water** -- Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

**Industrial user** -- A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.
Industrial wastewater -- Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business; from the development of any natural resource; or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

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

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

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

Local limits -- Specific prohibitions or limits on pollutants or pollutant parameters developed by a POTW.

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

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

Maximum day design flow (MDDF) -- The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) -- The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) -- The largest volume of flow anticipated to occur during a continuous 7-day period, expressed as a daily average.

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

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

Mixing zone -- An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The permit specifies the area of the authorized mixing zone that Ecology defines following procedures outlined in state regulations (chapter 173-201A WAC).
**National pollutant discharge elimination system (NPDES)** -- The NPDES (Section 402 of the Clean Water Act) is the federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the state of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both state and federal laws.

**pH** -- The pH of a liquid measures its acidity or alkalinity. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

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

**Peak hour design flow (PHDF)** -- The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

**Peak instantaneous design flow (PIDF)** -- The maximum anticipated instantaneous flow.

**Point of compliance** -- The location in the ground water where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the ground water as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

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

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day; or

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

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

**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).
**Reasonable potential** — A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

**Responsible corporate officer** — 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 employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

**Significant industrial user (SIU)** —

1. All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and

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

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

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

**Slug discharge** — Any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge to the POTW. This may include any pollutant released at a flow rate that may cause interference or pass through with the POTW or in any way violate the permit conditions or the POTW’s regulations and local limits.

**Soil scientist** — An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5, 3, or 1 year(s), respectively, of professional experience working in the area of agronomy, crops, or soils.

**Solid waste** — All putrescible and non-putrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.
Soluble BODs -- Determining the soluble fraction of Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of soluble organic material present in an effluent that is utilized by bacteria. Although the soluble BODs test is not specifically described in Standard Methods, filtering the raw sample through at least a 1.2 um filter prior to running the standard BODs test is sufficient to remove the particulate organic fraction.

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

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

Technology-based effluent limit -- A permit limit based on the ability of a treatment method to reduce the pollutant.

Total coliform bacteria -- A microbiological test, which detects and enumerates the total coliform group of bacteria in water samples.

Total dissolved solids -- That portion of total solids in water or wastewater that passes through a specific filter.

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

Upset -- An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent 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, lack of preventative maintenance, or careless or improper operation.

Water quality-based effluent limit -- A limit imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.
Appendix D—Influent and Effluent Data

Detailed information on the permit, compliance, and monitoring is available from the Water Quality Permitting and Reporting Information System (PARIS) at http://www.ecy.wa.gov/programs/wq/permits/paris/paris.html.

| Parameter | CROS | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ | CROZ |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|          | Unit | %    | Unit | %    | Unit | %    | Unit | %    | Unit | %    | Unit | %    | Unit | %    | Unit | %    | Unit | %    |
| Statutory Basis | | | | | | | | | | | | | | | | | |
| Date      | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value | Value |
| 1/1/2006  | 56   | 72   | 56   | 72   | 56   | 72   | 56   | 72   | 56   | 72   | 56   | 72   | 56   | 72   | 56   | 72   | 56   | 72   |
| 2/1/2006  | 70   | 60   | 70   | 60   | 70   | 60   | 70   | 60   | 70   | 60   | 70   | 60   | 70   | 60   | 70   | 60   | 70   | 60   |
| 3/1/2006  | 42   | 58   | 42   | 58   | 42   | 58   | 42   | 58   | 42   | 58   | 42   | 58   | 42   | 58   | 42   | 58   | 42   | 58   |
| 4/1/2006  | 12   | 88   | 12   | 88   | 12   | 88   | 12   | 88   | 12   | 88   | 12   | 88   | 12   | 88   | 12   | 88   | 12   | 88   |
| 5/1/2006  | 72   | 28   | 72   | 28   | 72   | 28   | 72   | 28   | 72   | 28   | 72   | 28   | 72   | 28   | 72   | 28   | 72   | 28   |
| 6/1/2006  | 32   | 68   | 32   | 68   | 32   | 68   | 32   | 68   | 32   | 68   | 32   | 68   | 32   | 68   | 32   | 68   | 32   | 68   |
| 7/1/2006  | 16   | 84   | 16   | 84   | 16   | 84   | 16   | 84   | 16   | 84   | 16   | 84   | 16   | 84   | 16   | 84   | 16   | 84   |
| 8/1/2006  | 8    | 92   | 8    | 92   | 8    | 92   | 8    | 92   | 8    | 92   | 8    | 92   | 8    | 92   | 8    | 92   | 8    | 92   |
| 9/1/2006  | 4    | 96   | 4    | 96   | 4    | 96   | 4    | 96   | 4    | 96   | 4    | 96   | 4    | 96   | 4    | 96   | 4    | 96   |
| 10/1/2006 | 2    | 98   | 2    | 98   | 2    | 98   | 2    | 98   | 2    | 98   | 2    | 98   | 2    | 98   | 2    | 98   | 2    | 98   |
| 11/1/2006 | 1    | 99   | 1    | 99   | 1    | 99   | 1    | 99   | 1    | 99   | 1    | 99   | 1    | 99   | 1    | 99   | 1    | 99   |
| 12/1/2006 | 0    | 100  | 0    | 100  | 0    | 100  | 0    | 100  | 0    | 100  | 0    | 100  | 0    | 100  | 0    | 100  | 0    | 100  |

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**Note:** The data table above includes the following parameters: Date, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value. The values represent different measurements taken over a period of time, with variations observed across different dates. The parameters include Flow, TSS, and pH, among others, indicating the consistency and variability in these measurements. The data is structured to provide a clear and organized presentation of the collected data points.
Appendix E – Technical Calculations

Several of the Excel® spreadsheet tools used to evaluate a discharger’s ability to meet Washington State water quality standards can be found on Ecology’s homepage at [http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html](http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html).

### Marine Un-ionized Ammonia Criteria Calculation


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</thead>
<tbody>
<tr>
<td>1. Receiving Water Temperature, deg C (90th percentile):</td>
<td>15.6</td>
</tr>
<tr>
<td>2. Receiving Water pH, (90th percentile):</td>
<td>8.1</td>
</tr>
<tr>
<td>3. Receiving Water Salinity, g/kg (90th percentile):</td>
<td>28.8</td>
</tr>
<tr>
<td>4. Pressure, atm (EPA criteria assumes 1 atm):</td>
<td>1.0</td>
</tr>
<tr>
<td>5. Un-ionized ammonia criteria (mg un-ionized NH₃ per liter) from EPA 440/5-88-004:</td>
<td></td>
</tr>
<tr>
<td>Acute:</td>
<td>0.233</td>
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<tr>
<td>Chronic:</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Molal Ionic Strength (not valid if &gt;0.85):</td>
<td>0.591</td>
</tr>
<tr>
<td>2. pKa8 at 25 deg C (Whitfield model &quot;B&quot;):</td>
<td>9.314</td>
</tr>
<tr>
<td>3. Percent of Total Ammonia Present as Un-ionized:</td>
<td>3.0%</td>
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<tr>
<td>4. Total Ammonia Criteria (mg/L as NH₃):</td>
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</tr>
<tr>
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<td>Chronic:</td>
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<th>RESULTS</th>
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<tr>
<td>Chronic:</td>
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## Calculation of Fecal Coliform at Chronic Mixing Zone

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<tr>
<td>Ambient Fecal Coliform, #/100 ml</td>
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<tr>
<td>Effluent Fecal Coliform - worst case, #/100 ml</td>
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<tr>
<td>Surface Water Criteria, #/100 ml</td>
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<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Fecal Coliform at Mixing Zone Boundary, #/100 ml</td>
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<tr>
<td>Difference between mixed and ambient, #/100 ml</td>
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**Conclusion:** At design flow, the discharge has no reasonable potential to violate water quality standards for fecal coliform.
### Human Health Reasonable Potential

<table>
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<th>Substance</th>
<th>Human Health Reasonable Potential</th>
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<tr>
<td>Antimony (dissolved)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Arsenic (dissolved)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Cadmium (dissolved)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Chlorine (Total Residual)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Copper (dissolved)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Nickel (dissolved)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Zinc (dissolved)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Chloroform (dissolved)</td>
<td>0.005 mg/L</td>
</tr>
<tr>
<td>Tetrachloroethylene (dissolved)</td>
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</tr>
<tr>
<td>Toluene (dissolved)</td>
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### Water Calculated with Potential

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<tr>
<td>Arsenic (dissolved)</td>
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<tr>
<td>Cadmium (dissolved)</td>
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<tr>
<td>Chlorine (Total Residual)</td>
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<tr>
<td>Copper (dissolved)</td>
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<tr>
<td>Nickel (dissolved)</td>
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<tr>
<td>Zinc (dissolved)</td>
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<tr>
<td>Chloroform (dissolved)</td>
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<tr>
<td>Tetrachloroethylene (dissolved)</td>
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<tr>
<td>Toluene (dissolved)</td>
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### Body Type

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<td>1.00</td>
</tr>
<tr>
<td>Children</td>
<td>1.50</td>
</tr>
</tbody>
</table>

### Notes

- Results are expressed as mg/L or g/L as appropriate.
- Limits are set to ensure public health and safety.
- Samples collected and analyzed as per standard procedures.
Appendix F – Response to Comments

Ecology received no comments during the draft comment period.
APPENDIX B

WAC 173-245-090(2)
WAC 173-245-090

Schedule updates — Monitoring — Reporting.

(1) By the anniversary date of its sewage treatment plant NPDES permit, in conjunction with its annual assessment for prevention of facilities overloading where applicable, a municipality shall submit an annual CSO report to the department for review and approval that:

(a) Details the past year’s frequency and volume of combined sewage discharged from each CSO site, or group of CSO sites in close proximity. Field monitoring is necessary to estimate these parameters. The report shall indicate whether a CSO site or group of sites has increased over the baseline annual condition; if any increase has occurred, the municipality shall propose a project and schedule to reduce that CSO site or group of sites to or below its baseline condition;

(i) When a CSO site has been reduced to an average of one overflow per year through use of storage or separation, the department may consider reducing the monitoring requirement to frequency verification;

(ii) If the selected CSO control project is at-site treatment and discharge, the department may issue a modification to the applicable sewage treatment plant permit or issue a separate NPDES permit for that discharge. The permit or permit modification must include effluent limits, flow capacity limits, and reporting requirements. The total treated and untreated annual discharge from an at-site treatment plant may not increase above the baseline annual;

(b) Explains the previous year’s CSO reduction accomplishments; and

(c) Lists the projects planned for the next year.

(2) In conjunction with its application for renewal of its applicable NPDES permit, the municipality shall submit an amendment to its CSO reduction plan. The amendment shall include:

(a) An assessment of the effectiveness of the CSO reduction plan to date; and

(b) A reevaluation of the CSO sites’ project priority ranking; and

(c) A list of projects to be accomplished in the next five years, based upon priorities and estimated revenues. The department of ecology may incorporate such a schedule into an administrative order or the applicable NPDES permit.

[Statutory Authority: RCW 90.48.110, 00-15-019 (Order 00-07), § 173-245-090, filed 7/11/00, effective 8/11/00. Statutory Authority: RCW 90.48.035, 87-04-020 (Order DE 86-34), § 173-245-090, filed 1/27/87.]
APPENDIX C

SEWER CAPITAL FACILITIES PLAN (2011-2016)
# City of Anacortes
## 2011-2016 Capital Facilities Plan
### Capital Costs By Project

<table>
<thead>
<tr>
<th>Project</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>Total</th>
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<tbody>
<tr>
<td>Sewer</td>
<td></td>
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<td>SC-006</td>
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<td>SC-028</td>
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<td>141,000</td>
<td>145,000</td>
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<td>Sewer Line Rehabilitation</td>
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<td>SP6-305</td>
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<td>SP6-600</td>
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<td>Replace Grit Removal System</td>
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<td>403,000</td>
<td>3,778,500</td>
<td>1,220,000</td>
<td>2,210,000</td>
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<td>Total Utility</td>
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<td>784,000</td>
<td>403,000</td>
<td>3,778,500</td>
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<td>Total This Plan Year</td>
<td>1,347,000</td>
<td>784,000</td>
<td>403,000</td>
<td>3,778,500</td>
<td>1,220,000</td>
<td>2,210,000</td>
<td>9,742,500</td>
</tr>
</tbody>
</table>
City of Anacortes
2014
CSO & Wet Weather Operation
Report

General Information

The NPDES permit number WA-002025-7 is issued to the City of Anacortes. The permit identifies CSO by discharge number. This report will refer to the CSO as it is identified in the permit. The CSO are located as identified in the following table:

<table>
<thead>
<tr>
<th>Discharge No.</th>
<th>Location</th>
<th>Receiving Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>Northernmost end of B Avenue</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td></td>
<td>Northernmost end of Q Avenue</td>
<td></td>
</tr>
</tbody>
</table>

Discharge number 002 is monitored with a Marsh-McBirney Model 256A flow meter. The Model 256A flow meter measures level and velocity and reports flows to the treatment plant via a radio telemetry system. When the meter is active the plant control system is programmed to activate an alarm that indicates overflow at this CSO. The plant data acquisition system totals the flow data and includes the information on plant reports. The following information applies to the Marsh-McBirney flow meter systems at Discharge #002:

1. The flow meter level and velocity-sensing device is located directly in the outfall pipe.
2. The flow meter will detect a level in excess of 0.4 inches. Any flow that does not reach or exceed 0.4 inches will not be measured.
3. The flow meter is capable of detecting velocity only when the level in the pipe is in excess of one inch. Total flow is computed from the velocity and level measurements, therefore the flow cannot be totaled unless the level in the pipe exceeds one inch.
4. The flow meter is set to record the level and velocity for 60 seconds, once every fifteen minutes.
5. Flow information is reported from 12:00 p.m. (midnight) to 11:59:59 p.m. (midnight) on the indicated day.
Discharge number 003 – As reported in the 2010 CSO Reduction Plan Update discharge number three has been decommissioned. Improvements over the years have eliminated overflow events at this location. The outfall pipe is plugged.

Discharge number 004 is monitored with a Krohne Magmeter, type IFS-4000/PF. The rate of flow measured by this meter is reported to the wastewater treatment plant via a radio telemetry system. The plant data acquisition system totals the flow data and includes the information on plant reports. A float switch also monitors this CSO. When the level in the sewer system approaches the height of the overflow weir the float is activated. This float switch activates an alarm at the wastewater treatment. Plant personnel are alerted of the impending CSO activity.

Rainfall reported is recorded at the Anacortes Wastewater Treatment Plant by a tipping bucket rain gauge. Rainfall totals are reported from 7:00 a.m. on the indicated day to 6:59:59 a.m. on the following day.

Detailed information for Discharge #002 and #004 are included in later next sections of this report with applicable flow trends included in Appendix A.

CSO #003 has been decommissioned and is no longer in service.

Rainfall data is included in Appendix B.

Appendix C contains a copy of the public notice advertised in the Anacortes American, the City of Anacortes official newspaper of record, announcing the availability of the Annual CSO report.
DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE CONDITION, DISCHARGE NO. 002, “B” AVE. CSO

FREQUENCY and VOLUME

As stated previously, discharge number 002 is monitored with a Marsh-McBirney Model 256A flow meter. Flow information from this meter is transmitted to the treatment plant via a radio telemetry system. Reports containing this flow information are generated on a daily and monthly basis.

There are no overflow events at this CSO site to report for 2014.

Total rainfall measured at the Anacortes Wastewater Treatment Plant in 2014 was 27.96”.

COMPARISON TO BASELINE

There has not been an overflow event at this CSO since 1997. A chart comparing current data to a baseline for this site is not included in this report as there is no data to put into the chart.
DETAIL OF FREQUENCY, VOLUME AND COMPARISON TO BASELINE CONDITION, DISCHARGE NO. 004, “Q” AVE. CSO

This CSO site is monitored with a Krohne Magmeter, type IFS-4000/PF. The rate of flow measured by this meter is reported to the wastewater treatment plant via a radio telemetry system. The plant data acquisition system totals the flow data and includes the information on plant reports. Impending overflow events are detected via a float switch which provides an alarm at the treatment plant.

There are no overflow events at this CSO site to report for 2014.

Total rainfall measured at the Anacortes Wastewater Treatment Plant in 2014 was 27.96”.

COMPARISON TO BASELINE

Flow monitoring was installed on this CSO in January of 1998. A total of five overflow events caused by precipitation have occurred during the seventeen year time period that flow has been monitored at this site; one in 2003, two caused by back to back storm events in 2007, one in 2009, and one in 2010.

The average frequency of overflow events at this CSO since flow monitoring was installed is equivalent to one event every 3.4 years, or a 29.4% probability of an overflow event occurring during any given year.

The NPDES permit requires that a summary be provided of the five year moving average number of CSO events be calculated and reported. During the last five years there has been one event at this CSO. This equates to an average of 0.2 events per year, or a 20% probability that a CSO event would occur during any given year.

A chart detailing overflow events and rainfall information for this CSO site during the most recent five year period is included in Appendix A.
CSO REDUCTION ACCOMPLISHMENTS

In 2014 plans were developed to replace 2198 linear feet of damaged and leaking sewer pipe in the U6 and E drainage basins along with repairing 4 manholes in the U6 basin and 1 manhole in the S6 basin. Construction on this project began in early 2015 after securing a bid of $342,167 for the project. Currently the City is in the early stages of planning additional I&I work for 2015.

Sewage from both the U6 and E drainage basins contribute to the hydraulic loading in the collection system which ultimately have potential to impact the Q Avenue CSO. Preliminary estimates of the flow in the U6 basin indicate between 120,000 and 240,000 gallons of water per inch of rainfall could be eliminated by correcting the I&I problems in the basin. It is anticipated that next project for 2015 will include additional work in the U6 basin.

PLANNED IMPROVEMENTS

The preliminary plans for improvements in 2015 are as follows:
1. Continue with pipe and manhole repairs in the U6 basin to address a variety of deficiencies found in pipes and manholes in this basin. A scope of work for the next phase of the U6 project has not been developed yet, but it is anticipated the project will be similar to work done in the L drainage basin. Wastewater in this basin drains to a pump station which will facilitate quantifying the effectiveness of the I&I project by comparing before and after data showing the response in flow to volume of rainfall.
2. Several manholes in the Marches Point Annexation area adjacent to the Golf Course will be replaced or repaired.
Influent flow to the Anacortes Wastewater Treatment Plant did not exceed the capacity of the secondary treatment process during calendar year 2014.

Influent flow to the Anacortes Wastewater Treatment Plant exceeded the capacity of the secondary treatment process two times. The following information about those events is summarized in the table below:

<table>
<thead>
<tr>
<th>Date</th>
<th>Duration</th>
<th>Bypass Volume in gallons</th>
<th>Flow at the time bypass started</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 21, 2012</td>
<td>9hrs 3 min.</td>
<td>435,103</td>
<td>8.03 MGD</td>
<td>1.49” *note</td>
</tr>
<tr>
<td>Nov 19, 2012</td>
<td>2hrs 43 min</td>
<td>93,859</td>
<td>9.0 MGD</td>
<td>0.96”</td>
</tr>
</tbody>
</table>

* Two day rainfall total, Feb 20 and 21
APPENDIX C
February 16, 1990

John Franz
Anacortes Wastewater Treatment Plant
P. O. Box 547
Anacortes, WA 98221-0547

Dear Mr. Franz:

On December 11, 1989, you submitted a "Notice of Construction and Application for Approval" (NOCA) to construct a secondary wastewater plant with a fluidized bed sewage sludge incinerator at 500 "T" Avenue, Anacortes, Washington.

The information provided with your application was reviewed to determine that all known, available and reasonable methods of air pollution control will be utilized. A Final Environmental Impact Statement was issued by the City of Anacortes on October 11, 1989.

After considering staff recommendation and the comments provided at a public hearing on this matter, the Board of Directors of the Northwest Air Pollution Authority (NWAPA) granted approval at their February 14, 1990, Board meeting for you to construct the wastewater treatment facility. This approval is contingent upon your payment of the required $600.00 plan examination and inspection fee and adherence to the following conditions:

1. The maximum feed rate to the incinerator shall not exceed 975 pounds per hour based on a 24 hour average.

2. All necessary permits and approvals from other agencies with jurisdiction shall be obtained and in force prior to startup.

3. Particulate emissions from the incinerator shall not exceed 0.015 grains per dry standard cubic foot corrected to seven percent oxygen.

4. Opacity from the stack as measured visually by EPA Method 9 shall not exceed five percent for more than six minutes in any one hour period.

5. Source test emission tests shall be conducted within 90 days of startup. The tests shall include an analysis of cadmium, lead, and mercury and show compliance with national ambient standards and with the Washington State Acceptable Source Impact Levels for air toxics. Additional control measures (possibly including sewage pre-treatment) shall be required if compliance is not demonstrated. Source emission testing shall be conducted biennially thereafter. Results shall be submitted to the NWAPA within 30 days after the tests are complete.

6. The installation shall be subject to the requirements of 40 CFR Subpart O (NSPS), and 40 CFR 61, Subpart E (NESHAPS).
7. Sampling ports must be provided in the exhaust stack. Sampling locations shall meet the requirements of 40 CFR Part 60 Appendix A. Adequate, permanent, and safe access to the test ports shall be provided.

8. The proponent shall submit a draft Operation and Maintenance plan before startup which identifies good practices to maintain compliance with all applicable air pollution rules and regulations. A final plan shall be submitted within 90 days after startup. An odor control complaint response program shall be included.

9. The installation shall comply with the final form of the proposed rule Standards for the Disposal of Sewage Sludge, 40 CFR 503.

10. Odors shall not be noted off-site in such quantities that result in a nuisance as determined by the NWAPA staff.

Final approval to operate shall be conditioned upon the facility meeting the requirements described above and conditions set forth in the application and the applicable air pollution control regulations, when in actual operation. This approval does not relieve the applicant or owner of any requirement of any other governmental agency.

Please notify me, in writing, when the modification is complete and provide the expected date that you propose to begin operation of the facility. An on-site inspection may be required before startup and again after the process has operated for a period of time. A "Certificate of Approval to Operate" will be issued after staff determines that the process was installed in accordance with the plans and specifications submitted with the application and can operate in compliance with the regulations of the Authority and the conditions of approval.

Please feel free to call if you have any questions regarding this OAC.

Sincerely,

James Randles
Director

Reviewed: Lynn Billington, P.E.

Revision A: Condition number 1 was revised to limit the maximum production feed rate to 850 pounds per hour. Previous condition required proponent to construct and operate in accordance with the information submitted in the application. Minor additional corrections made.

Revision B: Maximum incinerator feed rate in Condition 1 increased to 975 pounds per hour. A November 7, 2000 source test demonstrated compliance at a 978 pound per hour feed rate.
Pump Station #1
3911 Mallard Point


Wet Well:
6' in diameter x 11' 6''deep – (325 cu ft)
Top Elevation: ~193.86
Bottom elevation: ~205.36
Single 8'' inlet line
Wet well lined with elastomeric coating in upgrade project in 2000.
Wet well joints sealed in 2000 by chemical injection

Pumps:
2 each, Flygt Model #3102.090-6099 Impellor #432
5 HP 230V 3 phase Full Load Amps 13
RPM 1800 Weight of pump: 250 lb.

Control Points: (high float measured from top of hatch gutter to top of float):
Pumps Off - 0.5'  Lead Pump On – 2.5'
Lag Pump On - 2.75' Abnormal Low – 0.25'
Abnormal High – 3.0' High Level Float – 79'' (4.9' from bottom)

City of Anacortes
Sanitary Sewer Plan 2014
Abnormal High Reset – 2.75’

Gallons Per Minute (GPM):

<table>
<thead>
<tr>
<th></th>
<th>Pump 1</th>
<th>Pump 2</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>181</td>
<td>185</td>
<td>230</td>
</tr>
</tbody>
</table>

Valve Vault:
Size 6’ diameter x 5’-9.5” deep – (164cuft)
Gate Valves – 4” Resilient Wedge Gate Valve
Check Valves, 4” Intermatic Ball Check

Force Main:
Pipe: 4” PVC Length: 240’ Transition MH: A-57 inv 10.2’

Electrical Data:
Supply 240 Volt Single Phase
Third phase generated by AC Tech VFDs, one for each pump
Main disconnect located on pump station control panel support frame.
Emergency power trailer mounted engine generator, manual transfer switch.

Control panel:
Manufactured by U. S. Filter/Consolidated Electric
D152 pump station control system. Wet well level sensor is Consolidated Electric A-1000 pressure transducer.
In the event of a control system or D152 failure the control panel is equipped with a CB1T redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down.
AC Tech MC-1000 VFD used to manufacture third phase only. Pump is not operated as variable speed.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.

Normal Operation:
- Both Hand-Off-Auto switches in the Auto position.
- The D-152-controller “Auto Alternator Control Switch” in the “auto” alternate position.

With one pump out of service:
- Turn off breaker for out of service pump
- Hand-Off-Auto switch in Off position for out of service pump

City of Anacortes
Sanitary Sewer Plan 2014
• Select the remaining pump to be the lead position on the D-152 controller.
Originally installed in 1983, No upgrades performed to date.

Wet Well: 6' in diameter x 18' 1'' deep – (511cuft)
Top Elevation: 184.7
Bottom elevation: 166.62
Single 6” inlet line with an inv of 57” from the bottom.
Wet well material of construction - uncoated concrete.

Pumps:
2 each, Flygt Model #CS 3101 Impellor #433X
4 HP 230V 1 phase Full Load Amps 18
RPM 1800 Weight of pump: 251 lb.

Control Points measured from top of hatch or (measured from bottom):
Pumps Off – 197” (1.7’) Lead Pump On – 176” (3.4’)
Lag Pump On – 155” (5.1’) Wet well High Level Float – 124” (7.7’)

Gallons per Minute (GPM):

<table>
<thead>
<tr>
<th></th>
<th>Pump 1</th>
<th>Pump 2</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>203</td>
<td>185</td>
<td>291</td>
</tr>
</tbody>
</table>

City of Anacortes

Sanitary Sewer Plan 2014
Valve Vault:
Size 4' 6" diameter x 4' 10.5" deep – (139cuft)
Gate Valves – 4" Gate Valve
Check Valves, 4” Swing check

Force Main:
Pipe: 4" PVC Length: ~350' Transition MH: A-62 inv at 5.65'

Electrical Data:
Supply 240 Volt Single Phase
Main disconnect located on pump station control panel support frame.
Emergency power trailer mounted engine generator, manual transfer switch.

Control panel:
Manufactured by Klockner Mohler
Float switches control system.
This station does not have any control system redundancy. If the primary control system fails the pump station can only be operated manually.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.
Normal Operation:
• Both Hand-Off-Auto switches in the Auto position.

With one pump out of service:
• Turn off breaker for out of service pump
• Hand-Off-Auto switch in Off position for out of service pump
The pump that is in service will alternate between operating on the lead pump float and the lag pump float.
Originally installed in 1954, Upgraded and reconfigured in 2000. This is now a standard duplex pump station.

Wet Well: 5' x 7' rectangular well x 17' 8” deep - (618cuft)
Top Elevation: 43.92
Bottom elevation: 26.25
One 8” inlet line and one 12” inlet line
Wet well material of construction – urethane coated concrete.

Pumps:
2 each, Fairbanks Morse Model #5433MV  11.75” Impellor
10 HP  460V  3 phase  Full Load Amps  16.5
RPM 1155   Weight of pump: 640 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off – 1.0’ 
Abnormal Low 0.5’
Lead Pump On -4.25’  
Lag Pump On -4.5’
Abnormal High 4.5’  
High Level Float -147.5” (5.5’)

<table>
<thead>
<tr>
<th></th>
<th>Pump 1</th>
<th>Pump 2</th>
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</thead>
<tbody>
<tr>
<td>Typical amp-draw one pump running: (3 Phase)</td>
<td>14.6</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>14.5</td>
<td>15.1</td>
</tr>
</tbody>
</table>

City of Anacortes

Sanitary Sewer Plan 2014
Gallons Per Minute (GPM):  
<table>
<thead>
<tr>
<th>Pump 1</th>
<th>Pump 2</th>
<th>Both</th>
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</thead>
<tbody>
<tr>
<td>349</td>
<td>360</td>
<td>644</td>
</tr>
</tbody>
</table>

Valve Vault:  
Size 7' x 7' rectangular x 10' 8" deep – (522cuft)  
Gate Valves – 4” Resilient wedge gate valve  
Check Valves, 4” Flygt ball check

Force Main:  
Pipe: 8” HDPE  
Length: ~445’  
Discharges to U6-341, a manhole leading directly into PS 15’s grinder vault

Electrical Data:  
Supply 480 Volt Three Phase  
Power is supplied via a circuit breaker located on the MCC PS #15  
Main disconnect located on pump station control panel support frame.  
Emergency power supplied from PS #15, automatic transfer switch.

Control panel:  
Manufactured by U. S. Filter/Consolidated Electric  
Pressure transmitter/D152 control system. The D152 controller starts and stops pump based on the position of movable pins.  
In the event of a control system or D152 failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down.

Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.

Normal Operation:  
- Both Hand-Off-Auto switches in the Auto position.
- The D-152-controller “Auto Alternator Control Switch” in the alternate position

With one pump out of service:  
- Turn off breaker for out of service pump  
- Hand-Off-Auto switch in Off position for out of service pump  
- Select the in service pump to be the lead pump on the D152 controller

City of Anacortes  
Sanitary Sewer Plan 2014
Pump Station #4
2819 T Avenue


Wet Well: 5' x 7' rectangular well x 15' 4" deep – (537cuft)
Top Elevation: 24.62
Bottom elevation: 9.29
One 12" inlet line
Wet well material of construction – urethane coated concrete.

Pumps:
2 each, Fairbanks Morse Model #5432MV T4B1LY - 8.3" Impellor
15 HP 460V 3 phase Full Load Amps 19.5
RPM 1760 Weight of pump: 585 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off – 1.0’ Abnormal Low – 0.55’
Lead Pump On – 3.25’ Lag Pump On – 3.8’
Abnormal High – 4.0’ High Level Float -138”

Typical amp-draw one pump running: 13.4 12.3

City of Anacortes
Sanitary Sewer Plan 2014
(3 Phase) Gallons per Minute (GPM):

<table>
<thead>
<tr>
<th></th>
<th>Pump 1</th>
<th>Pump 2</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve Vault:</td>
<td>13.5</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td>Size 7’ x 7’ rectangular x 9’ 11” deep – (486cuft)</td>
<td></td>
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<tr>
<td>Gate Valves – 4” Resilient wedge gate valve</td>
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<tr>
<td>Check Valves, 4” Intermatic ball check</td>
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<tr>
<td>Force Main:</td>
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<tr>
<td>Pipe: 8” Concrete</td>
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<tr>
<td>Length: ~170’</td>
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<tr>
<td>Discharges into gravity MH # D-1 Inv 5.1’</td>
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<td></td>
</tr>
</tbody>
</table>

Electrical Data:
Supply 480 Volt Three Phase
MCC located on PS #4 site
Main disconnect located on pump station MCC.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 35 DGBB - 35kW ASCO Transfer switch

Control panel:
Manufactured by U. S. Filter/Consolidated Electric
Pressure transmitter/i620 control system, for information on the i620 control system see the manual.
In the event of a control system failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down.
Pumps are controlled by VFD
Telemetry: Direct Allen Bradley PLC communication,
Johnson Integra Data Radio

Normal Operation:
• Both Auto-Off-Reset switches in the Auto position.

City of Anacortes
Sanitary Sewer Plan 2014
• Both VFDs in auto
• Station is run on the VFDs. The i620 is currently set to start the lead pump at 100% speed at the lead pump on point. VFD rapidly reduces speed to 60%, maintains this speed until the lead pump off point.

With one pump out of service:
• Turn off breaker for out of service pump
• Auto-Off-Reset switch in Off position for out of service pump
Pump Station #5
1118 Edwards Way

Above ground

Control Panel

Wet Well

City of Anacortes
Sanitary Sewer Plan 2014

Wet Well: 12’ diameter x 14’ 4” deep – (1620cuft)
Top Elevation: ~20.75
Bottom elevation: ~6.4
One 24” inlet line and one 8” inlet line
Wet well material of construction – concrete

Dry pump/Valve Vault:
Size 10’ x 12’ rectangular x 8’ 1” deep (970cuft)
Gate Valves – 4” Plug
Check Valves - 4” Flygt ball check

Pumps:
4 each, Flygt Model #3153.090  Impellor 454
2 pumps are in the Wet Well and 2 are in the Dry Pump Vault.
18 HP  460V  3 phase  Full Load Amps  23
RPM 1760  Weight of pump: 423 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off – 1.5’  Abnormal Low - 0.15’
Lead Pump On -3.75’  Lag Pump On -4.0’
Abnormal High - 4.5’  High Level Float -55”

Typical amp-draw one pair of pumps running – 22 - 23 amps

The station is equipped with a Foxboro magnetic flow meter and typically discharges 540gpm at the pump on point.

Force Main:
Pipe: 6” Ductile Iron: Length: ~1372’ (pump station to Oakes Ave intercept)
Pipe: 12” Ductile Iron  Length: ~2380’ (Skyline Conveyance from PS#5 intercept point to discharge)
Discharges into gravity MH # SC-03

Electrical Data:
City of Anacortes
Sanitary Sewer Plan 2014
Affidavit of Publication in the matter of AA-1416982
In the Superior Court of the State of Washington In and For Skagit County

STATE OF WASHINGTON
County of Skagit ss

The undersigned, being first duly sworn on oath deposes that he/she is principal clerk of the Anacortes American, a weekly newspaper. That said newspaper has been approved as a legal newspaper by the Superior Court of Skagit County and is now and has been for more than six months prior to the publication hereinafter referred to, published in the English language continually as a weekly newspaper in Skagit County, Washington, and it is now and during all of said time was printed at an office maintained at the aforesaid place of publication of said newspaper.

That the annexed is a true copy of an advertisement, with publication dates, as it was published in regular issues (and not in supplemental form) of said newspaper commencing with the issue of February 17, 2016 and ending with the issue of March 30, 2016.

That such newspaper was regularly distributed to its subscribers during all of said period and the full amount of the fee charged for the foregoing is the sum of $318.40.

Katie Hall

Subscribed and sworn to before me this 30th Day of March, 2016
Notary Public and for the State of Washington
Date: March 30, 2016

Clerk

Clerk's filing stamp

NOTARY PUBLIC
STATE OF WASHINGTON
2-23-19
Supply 480 Volt Three Phase
Main disconnects located on back of control enclosure.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 100DGDB - 125kVA ASCO Transfer switch.
This station will not start the engine generator immediately on loss of line power. When power is lost the station will continue to monitor the wet well level on battery back up power. When the wet well level reaches the start lead pump level the generator will start, warm up and then start the pump. When the pump cycle has completed the generator will go through a cool down cycle and shut down. Since the control system is battery operated, the PLC monitors the charge on the battery. When the battery charge has depleted the generator will start and charge the batteries.

Control panel:
Manufactured by Technical Systems Inc.
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logics PLC. Pump motor starting is on Allen Bradley soft starts. These starters have programmable pump control built into them. The pumps are slowly ramped up in speed over a 3 to 7 second time period.
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pair of pumps is run on a timer; timer setting is based on the rate the wet well pumps down.
All pump station control set points input into PLC.
Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio. This station sends radio telemetry data to the wastewater treatment plant via a repeater station mounted on the water reservoir on Castellea Bluff. This station also receives stores and forwards the radio telemetry data from pump station 14.

Normal Operation:
• This is a tandem pump station. There are two pumps, 1 and 2, in the wet well and two more, 3 and 4 in the dry pump/valve vault.
• Pumps #1 & 3 operate together, as do pumps #2 & 4
• Normal operation is for one pump in the wet well to start and the corresponding pump in the dry pump/valve vault to start 2 – 3 seconds later. This starting sequence is controlled by the PLC.

City of Anacortes
Sanitary Sewer Plan 2014
• The two running pumps work together to overcome the head pressure in the force main. This arrangement allowed two 18 horsepower pumps to be used in the place on one ~100 horsepower pump.
• All four of these pumps are started and stopped by programmable soft starts. The starters have a shorter time programmed in for the wet well pump start than the dry pump/valve vault start.
• An air/vacuum release is located on the force main between the wet well and the dry pump/valve vault pumps. This valve allows the sewage to drain out of the dry pump/valve vault pump back down to the level of the sewage in the wet well every time the pumps shut off. On every pump start the air in the piping system and the dry pump/valve vault pump is expelled through this valve.
• Normal operation is with all four Hand-Off-Auto switches in the Auto position.
• When any one pump is removed or tagged out for maintenance the pump that it operates together with must also be turned off and tagged out.
• When operating this station manually a wet well pump should be started first, and then the corresponding dry pump/valve vault pump must be started.

Special operating conditions for Skyline Conveyance pump stations:
• Pump stations #5, 13 & 14 force mains are connected to one 12” ductile iron pipe that discharges to gravity at MH SC-03.
• These are high head pump stations and if two or more of them operate at the same time it increases the head, or pressure that each pump experience’s when it operates. This increase in head can increase pump vibration, cause cavitation or other damage to the pump.
• In order to eliminate detrimental effects caused by any two or all three of these stations pumping into the same pipe at the same time these stations are controlled so that in most circumstances they will not run at the same time.
• Pump station #14 accepts ferry boat waste, pumped directly off of the ferry into the wet well. PS #14 wet well has very little capacity to store sewage before overflowing. The PLC at PS #14 has been programmed to start the lead pump immediately when the well level reaches the start lead pump level.
• The PLC at pump station #14 controls the priority of the operation of all of the Skyline Conveyance pump stations.
• The priority of the stations is PS #14 has first priority, PS #13 has second priority and PS #5 had third priority.
• Any station that is called to run will run normally if there is no Priority Bypass signal.
• When PS #14 runs both PS #5 and 13 will stop and/or wait until the PS #14 pump the cycle is completed.
• When PS #13 is called to run PS #5 will stop and/or wait until the PS #13 pump cycle has completed.
• PS #5 was constructed with an oversize wet well. This was done to provide storage capacity in the well. Pump station #5 will wait for pump station #13 and 14 to complete pump cycles before running a cycle.
• If for any reason the high level float is activated at any of these three pump stations the pumps will run on the redundant control system timer regardless of any priority bypass signal.

With one pump out of service:
• Turn off breaker for out of service pump and tag out.
• Turn off breaker and tag out the corresponding pump
• Auto-Off-Reset switches in Off position for out of service pumps
Pump Station #6
3009 B Avenue


Wet Well:
6' in diameter x 18' deep – (509 cuft)
Top Elevation: ~275.17
Bottom elevation: ~257.17
Single 8” inlet line
Wet well lined with elastomeric coating in upgrade project in 2000.
Wet well joints sealed in 2000 by chemical injection

Pumps:
2 each, Flygt Model #3085.092-9600 Impellor #440
2.2 HP 230V 3 phase Full Load Amps 6.7
RPM 1670 Weight of pump: 145 lb.

Control Points (measured from bottom):
Pumps Off – 0.5’ Abnormal Low – 0.25’
Lead Pump On - 4.25’ Lag Pump On - 4.5’
Abnormal High 4.5’ High Level Float -137” (6.75’)

Pump 1 Pump 2 Both

City of Anacortes
Sanitary Sewer Plan 2014
Gallons Per Minute (GPM):

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<thead>
<tr>
<th></th>
<th>Pump 1</th>
<th>Pump 2</th>
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<tbody>
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<td>185</td>
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<tr>
<td>168</td>
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<tr>
<td>256</td>
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</tbody>
</table>

Typical amp-draw one pump running: 5.3
(3 Phase)

|        |        |        |
| 5.3    | 5.3    |
| 5.3    | 5.3    |
| 6.0    | 5.1    |

Force Main:
Pipe: 4” HDPE  Length: 90’ Transition MH: E-158 invert 5.6’

Valve Vault:
Size 6’ diameter x 5’-8” deep
Gate Valves – 4” Resilient Wedge Gate Valve
Check Valves, 4” Intermatic Ball Check

Electrical Data:
Supply 240 Volt  Single Phase
Third phase generated by AC Tech VFD
Main disconnect located on pump station control panel support frame.
Main power source located at 2309 30th St., underground cable owned by City of Anacortes from this address to the pump station. Approximately 1.5 blocks, or 450’.
Emergency power trailer mounted engine generator, manual transfer switch.

Control panel:
Manufactured by U. S. Filter/Consolidated Electric
D152 pump station control system. Wet well level sensor is Consolidated Electric A-1000 pressure transducer.
In the event of a control system or D152 failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down.
AC Tech MC-1000 VFD used to manufacture third phase only. Pump is not operated as variable speed.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.

Normal Operation:
• Both Hand-Off-Auto switches in the Auto position.

City of Anacortes
Sanitary Sewer Plan 2014
• The D-152-controller “Auto Alternator Control Switch” in the alternate position.

With one pump out of service:
• Turn off breaker for out of service pump
• Hand-Off-Auto switch in Off position for out of service pump
Select the remaining pump to be the lead position on the D-152 controller
Pump Station #7
1411 I Avenue

Originally installation date is unknown probably in the early 1970s. Upgraded and reconfigured twice, most recently in 1991. Pictures of the upgrade are in the pump station file. Simplex pump station with a simplex control panel.

Wet Well: 4’ in diameter x 10’ 10” deep (1360cuft)
Top Elevation: 66.1
Bottom elevation: 55.27
Single 8” inlet line
Wet well material of construction: - uncoated concrete.

Pumps:
1 each, Flygt Model #CS 3101 Impellor #435
5 HP 230V 1 phase Full Load Amps 18
RPM 1800 Weight of pump: 251 lb. Normal running amps 16

Control Points (floats measured from top of hatch gutter to top of float, feet off of bottom in parenthesis):
Pump Off - 118” (1.0’)  Pump On - 86” (3.6’)
Wet well High Level Float - 79” (4.25’)

City of Anacortes
Sanitary Sewer Plan 2014
Typical amp-draw one pump running: 13.4? 
Draw down time in seconds per foot: 21 second per foot @ 265 gpm.

Valve Vault:
Size 4’ diameter x 3’ 10” deep (48cuft) 
Gate Valve – 4” Gate Valve 
Check Valve - 4”Swing check

Force Main:
Pipe: 4” PVC    Length: ~300’    Transition MH: S-72 incl 9.4’

Electrical Data:
Supply   240 Volt   Single Phase
Third phase generated by “Flygt Modules” in control panel
Main disconnect located on pump station control panel support frame.
Emergency power trailer mounted engine generator, manual transfer switch.

Control panel:
Manufactured by Klockner Mohler
Float switch control system.
This station does not have any control system redundancy. If the primary control system fails the pump station can only be operated manually.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.

Normal Operation:
• Hand-Off-Auto switch in the Auto position.

With one pump out of service:
• If this pump is out of service temporary pumping must be put in place.
Pump Station #8
418 2nd Street

Originally installed in 1978, pump station was completely replaced in 1997. This is a grinder pump station.

Wet Well:
4’ in diameter x 5’ 5” deep – (68cuft)
Top Elevation: ~17.65
Bottom elevation: ~12.23’
Pump station #9 discharges directly into this station.
Single 6” gravity inlet line
Concrete wet well lined with elastomeric coating.

Pumps:
2 each, Hydromatic Model # G1X200
2 HP 230V 3 phase Full Load Amps 6.1
RPM 3450 Weight of pump: 85 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off – 0.75’ Abnormal Low – 0.5’
Lead Pump On -2.25’ Lag Pump On -2.5’
Abnormal High -3.75’ High Level Float -32”

City of Anacortes
Sanitary Sewer Plan 2014
Typical amp-draw one pump running: 5.3

Gallons per Minute (GPM):

Valve Vault:
Size 3’ x 2’ x 3’4” deep (20cuft)
Gate Valves – 1.25” Gate Valve
Check Valves, 1.25” Check Valve

Force Main:
Pipe: 1.5” PVC Length: 240’ Transition MH: M-7 incl el 3.2’

Electrical Data:
Supply 240 Volt Single Phase
Third phase generated by AC Tech VFD
Main disconnect located on pump station control panel support frame.
Emergency power trailer mounted engine generator, manual transfer switch.
Transfer switch and main power supply and meter are located approximately one block south on the west side of U Avenue. Shares power head end including transfer switch with pump station #9.

Control panel:
Manufactured by U. S. Filter/Consolidated Electric
D152 pump station control system. Wet well level sensor is Consolidated Electric A-1000 pressure transducer.
In the event of a control system or D152 failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down.
AC Tech MC-1000 VFD used to manufacture third phase only. Pump is not operated as variable speed. VFD speed is set at 50 Hz to prevent excessive amp draw.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.
Normal Operation:
- Both Hand-Off-Auto switches in the Auto position.
- The D-152-controller “Auto Alternator Control Switch” in the alternate position.

With one pump out of service:
- Turn off breaker for out of service pump
- Hand-Off-Auto switch in Off position for out of service pump
- Select the remaining pump to be the lead position on the D-152 controller
Originally installed in 1978, pump station was completely replaced in 1997. This is a grinder pump station.

Wet Well:
4’ in diameter x 5’ 8” deep —
Top Elevation: 18.6
Bottom elevation: 12.94’
Single 6” gravity inlet line
Concrete wet well lined with elastomeric coating.

Pumps:
2 each, Hydromatic Model # G1X200
2 HP 230V 3 phase Full Load Amps 6.1
RPM 3450 Weight of pump: 85 lb.

Control Points (high float measured from top of hatch gutter to top of float):
    Pumps Off – 0.5’        Lead Pump On -1.3’
    Lag Pump On -1.5’       Abnormal Low – 0.4’
    Abnormal High -1.8’     High Level Float -40”
City of Anacortes
Sanitary Sewer Plan 2014
Typical amp-draw one pump running: 5.3
5.2

Gallons per Minute (GPM):
Pump 1 Pump 2
39 31

Valve Vault:
Size 3’ x 2’ x 4’ deep
Gate Valves – 1.25” Gate Valve
Check Valves, 1.25” Check Valve

Force Main:
Pipe: 1.5” PVC Length: 217’ Transition MH: M-5 the overflow manhole for PS#8. The flow then flows by gravity into PS#8.

Electrical Data:
Supply 240 Volt Single Phase
Third phase generated by AC Tech VFD
Main disconnect located on pump station control panel support frame.
Emergency power trailer mounted engine generator, manual transfer switch.
Transfer switch and main power supply and meter are located approximately one block south on the west side of U Avenue. Shares power head end including transfer switch with pump station #8.

Control panel:
Manufactured by U. S. Filter/Consolidated Electric
D152 pump station control system. Wet well level sensor is Consolidated Electric A-1000 pressure transducer.
In the event of a control system or D152 failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer, timer setting is based on the rate the wet well pumps down.
AC Tech MC-1000 VFD used to manufacture third phase only. Pump is not operated as variable speed.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.

Normal Operation:
City of Anacortes
Sanitary Sewer Plan 2014
- Both Hand-Off-Auto switches in the Auto position.
- The D-152-controller “Auto Alternator Control Switch” in the alternate position.

With one pump out of service:
- Turn off breaker for out of service pump
- Hand-Off-Auto switch in Off position for out of service pump
- Select the remaining pump to be the lead position on the D-152 controller
Originally installed in 1978, pump station was completely replaced in 1998. This is a grinder pump station.

Wet Well:
4' in diameter x 5' 8" deep – (71cuft)
Top Elevation: ~11.58
Bottom elevation: ~5.92
6" & 4" gravity inlet lines
Concrete wet well lined with elastomeric coating.

Pumps:
2 each, Hydromatic Model # G1X200
2 HP 230V 3 phase Full Load Amps 6.1
RPM 3450 Weight of pump: 85 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off - 0.5’ Abnormal Low - 0.25’
Lead Pump On -1.5’ Lag Pump On -1.75’
Abnormal High 2.0’ High Level Float -38”
        Pump 1       Pump 2

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Sanitary Sewer Plan 2014
Typical amp-draw one pump running: 4.5 4.7
        Pump 1  Pump 2  Both
Gallons per Minute (GPM):  24  24  33

Valve Vault:
Size 3’ x 2’ x 3’ deep (18cuft)
Gate Valves – 1.25” Gate Valve
Check Valves; 1.25” Check Valve

Force Main:
Pipe: 1.5” HDPE ~20’  1.5” PVC  Length: 270’
Transition MH: M-38 inv el 3.1’

Electrical Data:
Supply  240 Volt  Single Phase
Third phase generated by AC Tech VFD
Main disconnect located on pump station control panel support frame.
Emergency power trailer mounted engine generator, manual transfer switch.
Transfer switch and main power supply and meter are located approximately
one block south at the intersection of Curtis and Pagoda. The power source,
meter head and transfer switch are located in a wooden enclosure between
Curtis and the neighboring driveway, near a utility pole. Shares power head
end including transfer switch with pump station #11.

Control panel:
Manufactured by U. S. Filter/Consolidated Electric
D152 pump station control system. Wet well level sensor is Consolidated
Electric A-1000 pressure transducer.
In the event of a control system or D152 failure the control panel is equipped
with a redundant control system. The redundant control is activated when
the high level float is tripped. One pump is run on a timer, timer setting is
based on the rate the wet well pumps down.
AC Tech MC-1000 VFD used to manufacture third phase only. Pump is not
operated as variable speed.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.

City of Anacortes
Sanitary Sewer Plan 2014
Normal Operation:
- Both Hand-Off-Auto switches in the Auto position.
- The D-152-controller “Auto Alternator Control Switch” in the alternate position.

With one pump out of service:
- Turn off breaker for out of service pump
- Hand-Off-Auto switch in Off position for out of service pump
- Select the remaining pump to be the lead position on the D-152 controller
Installed in 1978 this is a simplex grinder pump station.

Wet Well:
3’ in diameter x 13’ 10” deep – (98cuft)
Top Elevation: ~16.2
Bottom elevation: ~2.3
6” gravity inlet line
Steel wet well.

Pump:
1 each, Hydromatic Model # G1X200
2 HP 230V 1 phase Full Load Amps 18
RPM 3450 Weight of pump: 75 lb.

Control Points: (floats measured from top of hatch gutter to top of float, approximate distance above bottom in parenthesis):
Pump Off 163” (0.25’) Lead Pump On 126” (3.3’)
Wet well High Level Float 114” (4.3’)

City of Anacortes
Sanitary Sewer Plan 2014
Typical amp-draw: 8.0
8.7

Gallons per Minute (GPM): Pump 1
40

Valve Vault:
Valves are inside of the wet well

Force Main:
Pipe: 1.5” PVC  Length: ~370’
Transition MH: M-38 inv el 3.1’

Electrical Data:
Supply 240 Volt  Single Phase
Main disconnect located on pump station control panel support frame.
Emergency power trailer mounted engine generator, manual transfer switch.
Transfer switch and main power supply and meter are located approximately one block west at the intersection of Curtis and Pagoda. The power source, meter head and transfer switch are located in a wooden enclosure between Curtis and the neighboring driveway, near a utility pole. Shares power head end including transfer switch with pump station #10.

Control panel:
Manufactured by the Hydromatic Pump Inc. This station does not have any control system redundancy. If the primary control system fails the pump station can only be operated manually.
The wet well level is controlled by float switches.

Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.

Normal Operation:
• Hand-Off-Auto switch in the Auto position.

With one pump out of service:
• If the pump is out service a spare pump is kept on hand, otherwise temporary pumping arrangements will need to be made.
Originally installed in 1978, pump station was completely replaced in 1987. The station was replaced again in 2007. At that time, the force main was replaced with a 6" line, three phase power was brought in and an onsite standby generator was installed.

Wet Well:
8' in diameter x 14' deep (703cuft)
Top Elevation: ~24.5
Bottom elevation: ~10.5
A “Tops” 150 fiberglass basin is installed in the bottom of the wet well to channel the flow to the pumps in the most efficient manner. This helps keep solids from building up in the wet well.
The well penetrations include 3 - 8”gravity inlets with baffles mounted over the inlets to direct flow down into the well with a minimum of entrained air.
Two drain lines from the dry vaults are the only other inlet penetrations.

Pumps:
2 each, Flygt NP3153 Impellor #465
12 HP 230V 1 phase
RPM 1760 Weight of pump: 462 lb.
Full Load Amps 13
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Control Points (high level float measured from top of hatch gutter to top of float)
Lead Pump On: 3.5’
Pumps Off: 1.5’
Wet well Low Level Alarm: .07’
On Time Alarm: 0.5 hours
Lag Pump On: 3.7’
Wet well High Level Alarm: 4.0’
Wet well High Level Float: (112”)
Off Time Alarm: 18.0 hours

Typical amp-draw one pump running
Pump typically discharges 270gpm.

Valve Vault:
Size: 6’ x 7’ x 7’ deep (294cuft)
Valves – 2 each 4” Eccentric Plug Valves
Check Valves, - 2 each Flygt Ball Check Valves

Force Main:
Pipe: 6” PVC
Length: ~1000’
Transition MH: M-16 inv el 4.0’

Meter Vault
Size: 4’x 4’ x 5’ (80cuft)
Foxboro 4” Mag Meter w/grounding rings

Electric Vault
4.5’ x 7’ x 6’ (189cuft)
1 each: NEMA 7&9, Class 1 Div 1&2 Groups B, C & D Explosion Proof Junction Box for the pump connections.
1 each: Stainless steel intrinsically safe control panel for high level float and level transducer connections.

Electrical Data:
Supply 480 Volt 3Phase
Main disconnect is located on the back side of the control panel.
Back up power is supplied by a Cummins 40 kilowatt diesel generator.
Model # DGHD – 5935060
Freq – 60Hz  Rated KW 40  Rated KVA 50  Speed 1800RPM

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Control panel:  
Assembled by TSI  
Pressure transmitter wet well level control system. (Contegra level transducer)  
All pump station functions controlled by Allen Bradley Micro Logix PLC. Checks and changes can be made thru a panel view plus 400 interface. All pump station control set points input into PLC.  
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped causing both pumps run on a timer; timer setting is based on the rate the wet well pumps down.  
The panel also contains a UPS unit and the Foxboro IMT flow transmitter.  

Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio.

Normal Operation:  
- Both Hand-Off-Auto switches in the Auto position.

With one pump out of service:  
- Turn off breaker for out of service pump  
- Hand-Off-Auto switch in Off position for out of service pump  
- The pump that is in service will alternate between operating on the lead pump level and the lag pump level.
Pump Station #13
5918 Cabana Ln.

Originally installed in 1992 this is a duplex pump station, with an odor control chemical feed system. Pump stations #5, 13 and 14 all discharge into a common force main. Due to this common force main there are some special operating considerations related only to these stations. These conditions are included in each of these pump station O & M manual sections.

Structures:
One 975sqft cinderblock building that houses the generator, transfer switch and MCC.
The building has an intrusion alarm that alerts the main plant to unauthorized entries. A supervisor will train individual operators on the alarm system operation.

Wet Well: 12' diameter x 22' 4” deep (2524cuft) – concrete
Top Elevation: ~19.07
Bottom elevation: ~-3.26
One 24” inlet line

Pumps:
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2 each, KSB Model KRTK 200-400/754 Impellor 11050639
116 HP 460V 3 phase Full Load Amps 152
RPM 1785 Weight of pump: ~1900 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off - 2.9' Abnormal Low 1.5'
Lead Pump On -6.0' Lag Pump On -6.2'
Abnormal High 6.4' High Level Float -163

Typical amp-draw one pump running - ~125 amps
Station is equipped with a Foxboro magnetic flow meter and typically discharges 1080gpm at the pump on point.

Dry pump/Valve Vault:
Size 14’ x 8’ rectangular x 8’ deep (896cuft)
Gate Valves - 8”
Check Valves - 8”air cushioned swing check

Force Main:
Pipe: 12” Ductile Iron Length: ~10,200’
Discharges into gravity MH # SC-03

Electrical Data:
Supply 480 Volt Three Phase
Main disconnects located on the MCC.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 500 DFFB - 500kW
Cummins Onan Transfer switch Model OTCU 800G/3192G. The generator has a 46 gallon day tank and a 400 gallon external fuel storage tank.
The engine generator starts immediately on loss of line power and remains running until line power is restored.

Control panel:
Manufactured by Technical Systems Inc.
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logics PLC
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when

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the high level float is tripped. Both pumps are run on a timer; timer setting is based on the rate the wet well pumps down.
All pump station control set points input into PLC.

Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio. This station sends radio telemetry data to a repeater on the reservoir at Castellea Bluff.

Normal Operation:
- Normal operation is with both Hand-Off-Auto switches in the Auto position.

With one pump out of service:
- Turn off breaker for out of service pump and tag out.
- Hand-Off-Auto switch in “Off” position for out of service pump.

Special operating conditions for Skyline Conveyance pump stations:
- Pump stations #5, 13 & 14 force mains are connected to one 12” ductile iron pipe that discharges to gravity at MH SC-03.
- These are high head pump stations and if two or more of them operate at the same time it increases the head, or pressure that each pump experiences when it operates. This increase in head can increase pump vibration, cause cavitation or other damage to the pump.
- In order to eliminate detrimental effects caused by any two or all three of these stations pumping into the same pipe at the same time these stations are controlled so that in most circumstances they will not run at the same time.
- Pump station #14 accepts ferry boat waste, pumped directly off of the ferry into the wet well. PS #14 wet well has very little capacity to store sewage before overflowing. The PLC at PS #14 has been programmed to start the lead pump immediately when the well level reaches the start lead pump level.
- The PLC at pump station #14 controls the priority of the operation of all of the Skyline Conveyance pump stations.
- The priority of the stations is PS #14 has first priority, PS #13 has second priority and PS #5 had third priority.
- Any station that is called to run will run normally if there is no Priority Bypass signal.

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• When PS #14 runs both PS #5 and 13 will stop and/or wait until the PS #14 pump the cycle is completed.
• When PS #13 is called to run PS #5 will stop and/or wait until the PS #13 pump cycle has completed.
• PS #5 was constructed with an oversize wet well. This was done to provide storage capacity in the well. Pump station #5 will wait for pump station #13 and 14 to complete pump cycles before running a cycle.
• If for any reason the high level float is activated at any of these three pump stations the pumps will run on the redundant control system timer regardless of any priority bypass signal.

Odor Control System:
Odor control in the Skyline Conveyance pump stations is complicated by the fact that multiple pump stations discharge into a common force main. When odor is detected it can be difficult to determine which pump station caused the offending odor. The stakes can be very high. The Northwest Clean Air Agency (NWCAA) has regulatory authority over odor complaints. In the early 1990’s the NWCAA threatened the City of Anacortes with a fine over $100,000 for complaints from home owners around pump station #15. The fine was avoided by working with the home owners and implementing a solution in a timely fashion.

When an odor complaint is received it should be investigated thoroughly. An odor complaint form (form # 0-13) must be filled out immediately. The person that registered the complaint must be treated with the utmost respect, even if they are angry and it is difficult to talk them. The person that is complaining may have been putting up with the odor problem for a long time before they were able to figure out who to call.

Odors in the collection system are not just a nuisance. The gas that causes most of the odor complaints is hydrogen sulfide or H2S. At high concentrations H2S can cause physical problems or death. H2S has been detected at levels between 200 and 300 ppm in the gravity collection system along Oakes Avenue. This is enough to begin to cause health problems in humans. It can also cause corrosion problems. In the environment of the sewer H2S will form sulfamic acid when combined with the moisture present on the interior surface of gravity sewer pipes. This acid is particularly corrosive to concrete.

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The sewage pumped from this station is pumped through over 10,200 feet of pipe line containing ~62,000 gallons of sewage. The sewage in the pipe line is displaced as the pump stations on the Skyline Conveyance cycle on and off.

Sewage is full of organic material and micro-organisms. As the sewage is being detained in the pipeline the organisms consume the organic material. In order for the organisms to metabolize the food that has been consumed oxygen is required for respiration. Inside of the force main pipe there is little dissolved oxygen available and no access to any atmospheric source. The freely available oxygen is rapidly consumed. When the freely available dissolved oxygen is depleted classes of micro-organisms that are capable of anaerobic respiration will obtain oxygen by removing oxygen molecules from other chemical compounds.

Normally most or at least some of the oxygen used for anaerobic respiration comes from sulfide compounds, and as a by product of this respiration hydrogen sulfide, or H2S, formed. H2S is detected by people as the smell of rotten eggs. There are many other sources that bacteria will use to obtain chemically available oxygen; the result usually liberates a gas that causes odor complaints. For example, natural gas is odorless. Methyl mercaptan is added to natural gas to give it a distinctive odor. This allows people to detect a natural gas leak. Anaerobic respiration can release methyl mercaptan.

Pump Station #15 has been reported to the gas company (at that time it was Cascade Natural Gas) as a natural gas leak. The gas company responded and could not find the source of the odor. The gas company technician suspected the sewer pump station as the cause and contacted the wastewater treatment plant. Methyl mercaptan was created in the Skyline Conveyance system in sufficient quantity to be detected by people and reported as a natural gas leak.

The odor control chemical feed system in use at pump station #13 is intended to provide an alternative source of oxygen. A proprietary chemical with the trade name Bioxide is being fed into the wet well. Bioxide is a calcium nitrate salt. The chemically bound oxygen from the Bioxide is easier for the micro-organisms to use than sulfides or other chemical compounds available in the sewage. When the micro-organisms strip the oxygen off of the Bioxide, nitrogen (an odorless, non-toxic gas) is released.

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To measure the effectiveness of the odor control chemical feed system a portable data logging atmospheric H2S monitor is installed in MH SC-5. This is the first manhole after the Skyline Conveyance gravity transition manhole that is not in a traveled lane of Oakes Avenue. The meter logs the level of H2S in the manhole every five minutes. This logged data is used to control the dosage of Bioxide at both pump station #13 and 14. H2S up to 10 ppm is generally considered to be acceptable and does not cause odor complaints. If H2S levels greater than 10 ppm are being logged for more than one five minute data period the chemical feed rate at pump station #13 or #14, or both may need to be adjusted.

To determine which pump station is the cause of the odor problem the following has been found to be helpful:

- If more than 10 ppm H2S gas is measured on an ongoing basis throughout the day the problem is likely caused by pump station #13.
- If the problem occurs at apparently random times during the day but is not present all the time the cause is most likely pump station #14.
- If the odor is only detectable in the area around the gravity line on Oakes Avenue and around pump station 15 but NOT in the area around the gravity transition of the pump station #15 force main (the alley between 9th and 10th Street on F Avenue, MH #S-43) the problem is from pump station #14.
- If the odor problem is greatest in the area around the gravity transition of the pump station #15 force main the problem is from pump station #13. Past experience shows that when this is the problem the odor is usually the worst during the hours between midnight and 6 am. If all chemical feed has been interrupted at pump station #13 this area will experience odor during all hours of the day and night.

Two other methods of odor control have been attempted at pump station #13. Direct injections of pure oxygen and chlorine have been used, at times with auxiliary use of slime layer stripping by the use of sodium hydroxide. It is beyond the scope of this manual to explain the function of these methods of odor control. Oxygen was effective with the use of slime layer stripping. These methods were abandoned due to cost and safety considerations. Two methods of feeding chlorine were attempted, neither was effective. In fact the use of chlorine actually created some very nasty odors.

The odor control system is checked twice per week. There is a log sheet that is filled out by the operator conducting this check. The feed rate and

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chemical tank inventory is recorded. The operator informs the Operations Supervisor if the inventory is low at any pump station.

Odor Control chemical feed system components:

2250 gallon cross linked high density polyethylene horizontal storage tank
Two Siemens 38 gallons per day bellows pumps
Pump discharge calibration system.
For more information on this system see the Bioxide feed system manual or the odor control rounds manual.
For detailed operating instructions, calibration procedures etc. see the Bioxide pumping system manual and/or the pump station odor control rounds book.
Pump Station #14
2100 Ferry Terminal Road

Generator

Pump

Control Panel

Chemical Storage

Outside

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Originaly installed in 1992; this is a duplex pump station, with an odor control chemical feed system.
The station receives sewage from the public restrooms, the terminal building and from ferry boats docked at the terminal. There are no other businesses or homes connected to this station.
Pump stations #5, 13 and 14 all discharge into a common force main. Due to this common force main there are some special operating considerations related only to these stations. These conditions are included in each of these pump station O & M manual sections.

Structures:
One 975sqft cinderblock building that houses the generator, transfer switch and MCC.
The building has an intrusion alarms that alerts the main plant to unauthorized entries. A supervisor will train individual operators on the alarm system operation.

Wet Well: 10’ diameter x 9’ 6” deep (746cuft) – concrete
Top Elevation: 27.22
Bottom elevation: 17.72
One 6” force main inlet line used by both the terminal building and ferry boats, one 6” gravity line

Pumps:
2 each, KSB Model KRTK 200-400/454 Impellor 336
76 HP 460V 3 phase Full Load Amps 98
RPM 1775 Weight of pump: ~1800 lb.

Control Points: high float measured from top of hatch gutter to top of float):
Pumps Off – 0.9’ Abnormal Low 0.6’
Lead Pump On -2.5 Lag Pump On -3.0’
Abnormal High 5.5’ High Level Float -38”
Transducer is approximately 6” above the bottom of the wet well.
Typical amp-draw one pump running – 80 amps
The station is equipped with a Foxboro magnetic flow meter.
Pump station typically discharges ~350gpm at the pump on point.

Valve Vault:
Size 8’ x 6’ rectangular x 7’ 8” deep (368cuft)
Gate Valves – 6”
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Check Valves – 6” swing check

Force Main:
Pipe 6” Ductile Iron    Length 3156’
Pipe: 12” Ductile Iron: Length: ~4860’ (Shared force main with PS#13 & 5)
Discharges into gravity MH # SC-3

Electrical Data:
Supply 480 Volt Three Phase
Main disconnects located on the MCC inside the generator building.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 300 DFCB - 300kW
Cummins Onan Transfer switch model #OTCU 800-G/3192G. The generator has a 46 gallon day tank and a 400 gallon external fuel storage tank.
The engine generator starts immediately on loss of line power and remains running until line power is restored.

Control panel:
Manufactured by Technical Systems Inc.
Pressure transmitter wet well level control system.
All pump station functions are controlled by Allen Bradley Micro Logics PLC. In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down. All pump station control set points input into PLC.

Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio. This station sends radio telemetry data to pump station 5; which stores and forwards the data to the wastewater treatment plant via a repeater station mounted on the water reservoir on Castellea Bluff.

Normal Operation:
• Normal operation is with both Hand-Off-Auto switches in the Auto position.

With one pump out of service:
• Turn off breaker for out of service pump and tag out.

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• Hand-Off- Auto switch in Off position for out of service pump.

Special operating conditions for Skyline Conveyance pump stations:
• Pump stations #5, 13 & 14 force mains are connected to one 12" ductile iron pipe that discharges to gravity at MH SC-03.
• These are high head pump stations and if two or more of them operate at the same time it increases the head, or pressure that each pump experience's when it operates. This increase in head can increase pump vibration, cause cavitation or other damage to the pump.
• In order to eliminate detrimental effects caused by any two or all three of these stations pumping into the same pipe at the same time these stations are controlled so that in most circumstances they will not run at the same time.
• Pump station #14 accepts ferry boat waste, pumped directly off of the ferry into the wet well. PS #14 wet well has very little capacity to store sewage before overflowing. The PLC at PS #14 has been programmed to start the lead pump immediately when the well level reaches the start lead pump level.
• The PLC at pump station #14 controls the priority of the operation of all of the Skyline Conveyance pump stations.
• The priority of the stations is PS #14 has first priority, PS #13 has second priority and PS #5 had third priority.
• Any station that is called to run will run normally if there is no Priority Bypass signal.
• When PS #14 runs both PS #5 and 13 will stop and/or wait until the PS #14 pump the cycle is completed.
• When PS #13 is called to run PS #5 will stop and/or wait until the PS #13 pump cycle has completed.
• PS #5 was constructed with an oversize wet well. This was done to provide storage capacity in the well. Pump station #5 will wait for pump station #13 and 14 to complete pump cycles before running a cycle.
• If for any reason the high level float is activated at any of these three pump stations the pumps will run on the redundant control system timer regardless of any priority bypass signal.
Odor Control System:
Odor control in the Skyline Conveyance pump stations is complicated by the fact that multiple pump stations discharge into a common force main. When odor is detected it can be difficult to determine which pump station caused the offending odor. The stakes can be very high. The Northwest Clean Air Agency (NWCAA) has regulatory authority over odor complaints. In the early 1990's the NWCAA threatened the City of Anacortes with a fine over $100,000 for complaints from home owners around pump station #15. The fine was avoided by working with the home owners and implementing a solution in a timely fashion.

When an odor complaint is received it should be investigated thoroughly. An odor complaint form (form # 0-13) must be filled out immediately. The person that registered the complaint must be treated with the utmost respect, even if they are angry and it is difficult to talk them. The person that is complaining may have been putting up with the odor problem for a long time before they were able to figure out who to call.

Odors in the collection system are not just a nuisance. The gas that causes most of the odor complaints is hydrogen sulfide or H2S. At high concentrations H2S can cause physical problems or death. H2S has been detected at levels between 200 and 300 ppm in the gravity collection system along Oakes Avenue. This is enough to begin to cause health problems in humans. It can also cause corrosion problems. In the environment of the sewer H2S will form sulfamic acid when combined with the moisture present on the interior surface of gravity sewer pipes. This acid is particularly corrosive to concrete.

The sewage pumped from this station is pumped through over 8000 feet of pipe line containing ~33,000 gallons of sewage. The sewage in the pipe line is displaced as the pump stations on the Skyline Conveyance cycle on and off.

Sewage is full of organic material and micro-organisms. As the sewage is being detained in the pipeline the organisms consume the organic material. In order for the organisms to metabolize the food that has been consumed oxygen is required for respiration. Inside of the force main pipe there is little dissolved oxygen available and no access to any atmospheric source. The freely available oxygen is rapidly consumed. When the freely available
dissolved oxygen is depleted classes of micro-organisms that are capable of anaerobic respiration will obtain oxygen by removing oxygen molecules from other chemical compounds.

Normally most or at least some of the oxygen used for anaerobic respiration comes from sulfide compounds, and as a by product of this respiration hydrogen sulfide, or H2S, formed. H2S is detected by people as the smell of rotten eggs. There are many other sources that bacteria will use to obtain chemically available oxygen; the result usually liberates a gas that causes odor complaints. For example, natural gas is odorless. Methyl mercaptan is added to natural gas to give it a distinctive odor. This allows people to detect a natural gas leak. Anaerobic respiration can release methyl mercaptan. Pump Station #15 has been reported to the gas company (at that time it was Cascade Natural Gas) as a natural gas leak. The gas company responded and could not find the source of the odor. The gas company technician suspected the sewer pump station as the cause and contacted the wastewater treatment plant. Methyl mercaptan was created in the Skyline Conveyance system in sufficient quantity to be detected by people and reported as a natural gas leak.

The odor control chemical feed system in use at pump station #14 is intended to provide an alternative source of oxygen. A proprietary chemical with the trade name Bioxide is being fed into the wet well. Bioxide is a calcium nitrate salt. The chemically bound oxygen from the Bioxide is easier for the micro-organisms to use than sulfides or other chemical compounds available in the sewage. When the micro-organisms strip the oxygen off of the Bioxide, nitrogen (an odorless and non-toxic gas) is released.

Usually the sewage that is pumped into pump station #14 from the ferry boats has already gone anaerobic while it was in a tank on the ferry. This sewage already has dissolved odorous compounds in it. Bioxide is not effective at eliminating odorous compounds that are already present. Bioxide has proven to be a very effective method of preventing the generation of additional odorous compounds.

To measure the effectiveness of the odor control chemical feed system a portable data logging atmospheric H2S monitor is installed in MH SC-5. This is the first manhole after the Skyline Conveyance gravity transition manhole that is not in a traveled lane of Oakes Avenue. The meter logs the level of H2S in the manhole every five minutes. This logged data is used to
control the dosage of Bioxide at both pump station #13 and 14. H2S up to 10 ppm is generally considered to be acceptable and does not cause odor complaints. If H2S levels greater than 10 ppm are being logged for more than one five minute data period the chemical feed rate at pump station #13 or #14, or both may need to be adjusted.

To determine which pump station is the cause of the odor problem the following has been found to be helpful:

- If more than 10 ppm H2S gas is measured on an ongoing basis throughout the day the problem is likely caused by pump station #13.
- If the problem occurs at apparently random times during the day but is not present all the time the cause is most likely pump station #14.
- If the odor is only detectable in the area around the gravity line on Oakes Avenue and around pump station 15 but NOT in the area around the gravity transition of the pump station #15 force main (the alley between 9th and 10th Street on F Avenue, MH #S-43) the problem is from pump station #14
- If the odor problem is greatest in the area around the gravity transition of the pump station #15 force main the problem is from pump station #13. Past experience shows that when this is the problem the odor is usually the worst during the hours between midnight and 6 am. If all chemical feed has been interrupted at pump station #13 this area will experience odor during all hours of the day and night.

Three other methods of odor control have been attempted at the ferry terminal pump station. Direct injections of pure oxygen, hydrogen peroxide and chlorine have all been used, at times with auxiliary use of slime layer stripping by the use of sodium hydroxide. It is beyond the scope of this manual to explain the function of these methods of odor control. Oxygen and hydrogen peroxide were both effective with the use of slime layer stripping. These methods were abandoned due to cost and safety considerations. Two methods of feeding chlorine were attempted, neither was effective. In fact the use of chlorine actually created some very nasty odors.

The odor control system is checked twice per week. There is a log sheet that is filled out by the operator conducting this check. The feed rate and chemical tank inventory is recorded. The operator informs the Operations Supervisor if the inventory is low at any pump station.

Odor Control chemical feed system components:
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400 gallon cross linked high density polyethylene horizontal storage tank
One Davis Industries 19 gallon per day bellows pump
One calibration chamber.

For detailed operating instructions, calibration procedures etc. see the Bioxide pumping system manual and/or the pump station odor control rounds book.
Pump Station #15
1200 B Avenue

Outside View

Pump

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Originally installed in 1992; this is a triplex pump station, with a packed tower and carbon filter odor scrubbing system. The station received a major upgrade in 2005. All flow was diverted to an influent structure containing a "channel monster" grinder unit. One of the 67HP KSB pumps was replaced with a 12HP Flygt pump designed to carry most of the stations load.

This pump station receives the sewage pumped from the Skyline Conveyance System pump stations as well as pump station 3 and gravity feed from other residential areas generally west of F Avenue and north of the D Avenue hill. Due to the pump discharge rates of pump stations #5, 13 and 14 the influent flow to this station varies dramatically.

This pump station is the largest pump station in the Anacortes system pumping an average of ~375,000 per day.

Structures:
One 975sqft cinderblock building that houses the generator, transfer switch and MCC.
One 515sqft cinderblock building housing the scrubber system, the diesel fuel tank, a remote lab and a bathroom
The buildings have intrusion alarms that alert the main plant to unauthorized entries. A supervisor will train individual operators on the alarm system operation.

Influent Structure: 8' diameter x 14' deep (703cuft) - concrete
Top of slab Elevation: ~63.73
Bottom elevation: ~49.73
Channeled on the bottom to direct flow thru the grinder unit.
One - 24' concrete inlet line IE ~51.20
One - 12" PVC inlet line IE ~51.06
One - 24" PVC discharge line to wet well IE ~50.03

Grinder:
1 each Muffin Monster / Channel Monster model CMD1810-AD
1 each Flygt 3127 .090-2558 Drive Unit 5 HP  460V  6.8A
3 phase 1770 RPM with 29:1 reducer weight of assembly 1965 lb.
Wet Well: 12' diameter x 20.35' deep (2300cuft) - concrete
Top Elevation: ~63.78
Bottom elevation: ~43.43

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One 24” PVC inlet line IE ~49.98
The bottom of the wet well is sloped to prevent problems with settling solids. The top of the slope begins at the 5’ level from the bottom of the wet well and angles down to within 6’ from the pump volutes. This slope ends 5’ from the wall on the inlet pipe side of the wet well and about 4’ from the wall on the discharge side of the pump creating an offset 3’ x 9’ oval sump bottom for the three pumps. In addition the 12HP center pump (#2) sits in a sump a foot lower than the other two pumps.

Pumps:
2 each, (pumps #1 & #3) KSB Model KRTK 150-315/454 Impellor 290mm
67 HP 460V 3 phase Full Load Amps 88
RPM 1785 Weight of pump: ~1700 lb.
1 each (pump#2) Flygt Model NP 3153 HT (3153.091-5071)
12HP 460V 3 phase Full Load Amps 16
RPM 1760 Weight of Pump 434 lb / 537 lb with discharge connection

Control Points
High Level Float -151“ measured from top of hatch gutter to top of float

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KSB pumps typical amp-draw one pump running – ~80 – 82- 81 amps
These pumps typically discharge 1380gpm with one pump on at 100% speed.
The Flygt pump typically discharges 695gpm at 100% speed.

Electrical Vault (added 2005)
Size: 6’ x 7’ rectangular concrete vault 5’ deep (210cuft)
Contains a 30” x 24” explosion proof terminal box for pump connections

Dry pump/Valve Vault:
Size 14’ x 8’ rectangular x 13’ deep
Gate Valves – 8”
Check Valves – 8” Flygt ball check
Force Main:
Pipe: 12” Ductile Iron Length: ~3074’

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Discharges into gravity MH # S-43

Electrical Data:
Supply  480 Volt  Three Phase
Main disconnects located on the MCC. These pumps are run on a VFD’s and are intended to run 24 hours per day. The intent of the constantly running and varying the speed of the pumps is to minimize flow fluctuations at the wastewater treatment plant.
Emergency power supplied by onsite engine generator with automatic transfer switch. This generator supplies all power for PS #15 including the odor scrubber building, and all power for PS #3
Standby Engine Generator: Cummins Onan Model 400 DFEB - 400kW
Cummins Onan Transfer switch Model OTCU 800-G/3192G. The generator has a 46 gallon day tank and a 400 gallon external fuel storage tank.
The engine generator starts immediately on loss of line power and remains running until line power is restored.

Control panel:
Manufactured by Technical Systems Inc
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logix 1500 PLC. The system is monitored and control points are set with a Panel View Plus 600 interface.
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down. The pump that runs on the timer is selected on a switch on the panel door. If a pump is out of service the operator must ensure that the out of service pump is not selected on the redundant control system.
Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio.

VFDs:
Pumps 1 and 3, the KSBs use Robicon (now Siemens) VFDs
Basic Part #454910.00
100 HP 460 V 124 Amp output
PCI Board dip switch settings:
SW1, pole 1 must be closed (up) to make parameter (Drive or Motor settings) changes

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SW1, pole 2 should be closed.

Pump #2 uses a Allen-Bradley “Power flex 70” VFD

Normal Auto Operation:

Channel Monster Grinder Unit
- The Hand-Off-Auto switch is kept in the hand position as the grinder is designed to run continuously.

Pumps
- The station is designed to operate almost exclusively on the 12HP Flygt pump with the 67HP KSB running only during extreme flow events. A spare 12 HP pump is kept on hand as a replacement for the duty pump.
- Normal operation is with all three Hand-Off-Auto switches on the VFD’s in the Auto position and their “Line - Off - VFD” switches in the VFD position.

To manually run either of the larger KSB pumps (1 & 3) using variable speed:
- Select the “Hand” switch position
- Push the start button
- Adjust VFD speed with the “Manual Speed Adjust” switch
- Stop pump by pushing the stop button.

To manually run either of the larger KSB pumps (1 & 3) at constant (100%) speed using the VFD bypass contactor:
- Select the “Line” switch position
- Push the start button.
- Pump will start on direct across the contactor and run until the stop button is pushed.

To manually run the smaller Flygt pump (#2)
- Open the #2 pump control panel door
- Select the “Manual” button on the VFD keypad
- Push the start button
- Adjust VFD speed with the keypad up and down arrows
- Stop pump by and return to auto by pressing Automatic on the keypad.

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With one pump out of service:

- Turn off breaker for out of service pump and tag out.
- PLC control system will automatically select lead and lag pumps based on which pumps are not in auto.
- Hand-Off-Auto switch in "Off" position for out of service pump(s).
- Set the Redundant Controller switch position for the in-service pump.

Odor Scrubbing System:
This pump station receives some residential sewage as well as sewage discharged from the Skyline Conveyance force main. Sewage in this force main is subjected to long holding times in an anaerobic environment. For a detailed explanation of the causes of the odor problems created in this force main see Operations and Maintenance Manual sections for pump stations #13 and 14.

Due to the difficulty of continuously controlling the odors generated in the Skyline Conveyance force main and in particular from the ferry boat waste water, an odor scrubbing system was installed at pump station 15. The system was initially rented. A two stage wet packed tower system was selected. It was discovered that this system worked well for the vast majority of the time. During periods of high levels of odor from ferry boat waste water, especially during the hot summer months, the wet packed tower will not effectively scrub the all of the odorous compounds. A down flow twin carbon canister system was added to the discharge from the wet packed tower system. This system has proven to be 100% reliable when all the components are in service and operating.

In 1999 this system was installed in a building that houses the scrubber system and chemical storage tanks, controls and a remote lab, and the engine generator diesel fuel storage tank. The room that the scrubber and chemical storage tanks are housed in is ducted directly to the pump station wet well. Due to this the room was given an electrical rating of Class I, Division I Group D. All electrical equipment in this room must be explosion proof.

This system draws 400cfm of odorous air through an 8” PVC pipe that is used as duct from the wet well. The odorous air passes up through the packing material in the first tower and a chemical solution is sprayed down from the top of the tower. The odorous air is ducted back down to the
bottom of the second tower and again passes up through packing material with chemical solution sprayed down through it. The tower packing material is designed to provide a large amount of surface area while also permitting both water and air to easily pass through. The large surface area of the packing material provides for a great amount of contact between the odorous air and the scrubbing solution. Each tower is also equipped with a mist eliminator to minimize the amount of scrubbing solution water being carried out of the tower in the air stream.

The scrubbing solution is city water adjusted to a pH of 10 using caustic soda. The solution also has liquid chlorine bleach added to a control point of 600 mV Oxidation Reduction Potential, or ORP. The chlorine is intended to destroy organic odors and hydrogen sulfide. The odor scrubbing properties of the chlorine are more effective at the pH of 10, and decreases dramatically as the pH is lowered. The high pH is also effective scrubbing some acid based organic odors. Without pH adjustment (at a pH of around 7) the scrubber discharge will have an odor similar to silicone caulk. The cause of this odor is thought to be acetic acid.

The scrubbing solution water is collected in a reservoir at the bottom of each scrubbing tower. Each tower has a scrubber solution recirculation pump that draws solution water from the reservoir at the bottom of the tower and discharges the solution through spray nozzles over the top of the packing material.

The remains of the odorous compounds that were in the odorous air stream are now contained in the solution water. To prevent these compounds from building up to a level that would interfere with the function of the solution a small amount of make up water is continuously added. The water is added to number one tower and overflows directly into tower number two, number two overflows to waste.

This scrubbing tower is an induced draft system. The 400cfm blower is located after the tower. The entire scrubber system is effectively operating at a negative pressure. Any leak in this part of the system will result in outside air leaking into the odorous air stream. The fan discharges into a PVC pipe that is functioning as a duct. The air is then routed to a duplex carbon canister. The carbon polishes all remaining odorous compounds from the air. The exhaust is discharged directly to the atmosphere.
The scrubber system is drawing 400cfm out of the gravity sewer collection system. The air can be drawn in through area sewer venting and manhole pick-holes. However the object of this scrubber system is to gather as much odorous air as is possible from the Skyline Conveyance gravity system. To accomplish this, the cover for manhole # SC-5 has been replaced with a storm sewer grate. The grate allows air to easily flow into the sewer system. This is the farthest manhole that will allow the air to flow in. If the storm grate is installed on the next manhole to the west (# SC-4) no air is drawn in through the grate.

The odor scrubber system is checked twice per week. There is a log sheet that is filled out by the operator conducting this check. The ORP and pH meter calibrations are tested, and the chemical tank inventory is recorded. The operator informs the Operations Supervisor if the inventory is low.

Odor control in the Skyline Conveyance collection and conveyance system is complicated. When odor is detected it can be difficult to determine what is causing the offending odor. The stakes can be very high. The Northwest Clean Air Agency (NWCAA) has regulatory authority over odor complaints. In the early 1990's the NWCAA threatened the City of Anacortes with a fine over $100,000 for complaints from home owners around pump station #15. The fine was avoided by working with the home owners and implementing a solution in a timely fashion.

When an odor complaint is received it should be investigated thoroughly. An odor complaint form (form # 0-13) must be filled out immediately. The person that registered the complaint must be treated with the utmost respect, even if they are angry and it is difficult to talk to them. The person that is complaining may have been putting up with the odor problem for a long time before they were able to figure out who to call.

Odors in the collection system are not just a nuisance. The gas that causes most of the odor complaints is hydrogen sulfide or H2S. At high concentrations H2S can cause physical problems or death. H2S has been detected at levels between 200 and 300 ppm in the gravity collection system along Oakes Avenue. This is enough to begin to cause health problems in humans. It can also cause corrosion problems. In the environment of the sewer H2S will form sulfamic acid when combined with the moisture present on the interior surface of gravity sewer pipes. This acid is particularly corrosive to concrete.

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To determine which pump station is the cause of the odor problem the following has been found to be helpful:

- Check the discharge of the carbon canisters. If there is odorous air being discharged from the carbon canisters it is likely that the carbon is spent and must be replaced.
- Check the velocity of the air being discharged by the carbon canisters. Low velocity air may mean that the air flow is restricted in some way. This will reduce the effectiveness of the scrubbing system and may allow some odorous compounds to escape to the atmosphere through sewer vents.
- If the odor is only detectable in the area around the gravity line on Oakes Avenue and around pump station 15 but NOT in the area around the gravity transition of the pump station #15 force main (the alley between 9th and 10th Street on F Avenue, MH #S-43) the problem is from pump station #14. In addition the scrubber system at PS #15 is not functioning properly.
- If the odor problem is greatest in the area around the gravity transition of pump station #15 force main the problem is being caused by pump station #13. Past experience shows that when this is the problem the odor is usually the worst during the hours between midnight and 6 am. If all chemical feed has been interrupted at pump station #13 this area will experience odor during all hours of the day and night.

Odor scrubber system components:

Packed tower scrubber:
- Two 175 gallon polyethylene vertical storage tanks with 140 gallons of usable space in each. One for sodium hypochlorite and one for sodium hydroxide.
- One Watson Marlow peristaltic pump for sodium hypochlorite
- One All Flow diaphragm pump for sodium hydroxide
- New York Blower Co – IM-170
- Two Sta-Rite 1/6 hp recirculation pumps
- 400 cfm two stage packed tower system
- Great Lakes Instruments pH meter and probe
- Great Lakes Instruments ORP meter and probe

Carbon Scrubber:
- Calgon Co. Hi Flow Ventsorb 400 cfm
- 225 pound carbon capacity carbon scrubber

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- 28" diameter
- bed depth 17.5"

For detailed equipment information, operating instructions, calibration procedures etc. see the O & M Manual for the Duplex Scrubber System, Great Lakes Instrument manuals, and/or the pump station odor control rounds book.
Pump Station #16
4533 Anaco Beach Road

Originally installed in 1994, duplex pump station, upgraded electrical service to allow both pumps to run at the same time and added manual transfer switch in 2002. Control system upgrade to Micro Logics PLC in 2005.

Wet Well: 6' diameter x 9' 3” deep (261cuft)
Top Elevation: 27.73
Bottom elevation: 18.48
One 8” inlet line
Wet well material of construction – concrete.

Pumps:
2 each, Flygt CP -3140 Impellor #481 HT
15 HP 230V 3 phase Full Load Amps 20
RPM 1745 Weight of pump: 615 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off – 1.0’ Abnormal Low 0.85’
Lead Pump On -3.25’ Lag Pump On -3.5’
Abnormal High 4.0’ High Level Float -68”

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Typical amp-draw one pump running: 29.6  26.6
29.8  28.8
30.8  31.0

Gallons per Minute (GPM):
Pump 1  Pump 2  Both
212  221  238

Dry pump/Valve Vault:
Size 6' x 4' rectangular x 5.8' deep (136cuft)
Gate Valves – 4"
Check Valves – 4” ball check

Force Main:
Pipe: 4” PVC  Length: ~1200’
Discharges into gravity MH # SC6-054

Electrical Data:
Supply  240 Volt  Single Phase
Main disconnects located on the MCC.
Emergency power supplied by dedicated (equipped only for use with pump station #16) engine generator with automatic transfer switch.
Dedicated Portable Engine Generator: Cummins Onan Model 80 DGDA - 80kW
The generator has a fuel tank capacity of 24 hours at full load power.
In times of impending or actual power outage the generator is towed to the pump station and connected to the transfer switch. In the event of power loss the transfer switch is thrown and the generator is run to supply electrical power.

Control panel:
Manufactured by Technical Systems Inc.
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logics PLC
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped causing both pumps run on a timer; timer setting is based on the rate the wet well pumps down.
All pump station control set points input into PLC.
Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio. This station sends radio telemetry data to a repeater on the reservoir at Castellea Bluff. This in turn forwards the data to the plant.

Normal Operation:
- Normal operation is with both Hand-Off-Auto switches in the Auto position.

With one pump out of service:
- Turn off breaker for out of service pump and tag out.
- Turn off breaker and tag out the corresponding pump
- Hand-Off-Auto switch in Off position for out of service pump.
This duplex pump station was originally installed in 2009, by the port. The City of Anacortes WWTP took control of the station in April 2010

Wet Well: 8' diameter 14' 6" deep (729cuft)
Top Elevation: 16.05
Bottom elevation: 1.6
One 8" inlet line
Wet well material of construction – concrete

Pumps:
2 each, Flygt Model Impellor
10 HP 460V 3 phase Full Load Amps 13.0
RPM 1735 Weight of pump: 340 lb.

Control Points (high level float measured from top edge of hatch gutter):
Pumps Off – x.x’ Abnormal Low x.x’
Lead Pump On -XX’ Lag Pump On -XX’
Abnormal High XX High Level Float -XX”

Typical amp-draw one pump running: XX

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Gallons per Minute (GPM):

Valve Vault:
Size XX’ x X’ rectangular x X’ deep (xxxxcuft)
Gate Valves – X” Resilient wedge gate valve
Check Valves, X” Flygt ball check

Force Main:
Pipe: 4” C900 PVC / PVC Length: 810’ (596’ C900PVC / 214’PVC)
Discharges into gravity MH # N-022

Electrical Data:
Supply 480 Volt Three Phase
Main disconnects located on the back of the control enclosure.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 35 DGBB - 35kW ASCO Transfer switch. The generator has a sub-base fuel tank designed to provide 24 hours fuel supply at full load.
The engine generator starts immediately on loss of line power and remains running until line power is restored

Control panel:
Manufactured by Technical Systems Inc
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logics PLC
and all pump station control set points input into PLC
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. Both pumps run on a timer; timer setting is based on the rate the wet well pumps down.

Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio.

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Normal Operation:
- Normal operation is with both Hand-Off-Auto switches in the Auto position.

With one pump out of service:
- Turn off breaker for out of service pump and tag out.
- Turn off breaker and tag out the corresponding pump
- Hand-Off-Auto switch in off position for out of service pump.
Pump Station #18
8071 South March Point Road

Outside View

Control Panel

Chemical Storage

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Originally installed in 2000; this is a duplex pump station, with an odor control chemical feed system. Control system upgrade to Micro Logics PLC in 2004.

Structures:
One 987sqft cinderblock building that houses the generator, transfer switch, MCC, odor control feed system and a bathroom.

Wet Well: 8’ diameter x 28’ 5” deep (1432cuft)
Top Elevation: 15
Bottom elevation: -14
One 12” inlet line
Wet well material of construction – polyurethane coated concrete.

Pumps:
2 each, Fairbanks Morse Model 4-D5434MV, Frame 360T
Impeller T4D1AT 15.65”
100 HP 460V 3 phase Full Load Amps 118
RPM 1780 Weight of pump: 2060 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off – 2.2’ Abnormal Low 1.0’
Lead Pump On -4.0’ Lag Pump On -5.0’
Abnormal High 6.0 High Level Float -264”

Typical amp-draw one pump running – 28, 30, 29 amps
The station is equipped with a Foxboro magnetic flow meter and typically discharges ~108gpm at the pump on point.

Valve Vault:
Size 6’ x 6’ rectangular x 7.25’ deep (261cuft)
Gate Valves – 6”
Check Valves – 6” ball check

Force Main:
Pipe: 6” HDPE Length: ~14,400’
Discharges into gravity MH # C-16
Electrical Data:
Supply 480 Volt Three Phase
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Main disconnects located on the MCC. These pumps are run on a VFD’s. These VFD’s are not programmed to run the pumps 24 hours per day, there is too little flow at this station to permit this mode of operation. The VFD’s currently soften the start and stop of these pumps. When the flows increase to this station the VFD programming will be modified.

Emergency power:
Standby Engine Generator: Cummins Onan Model 230 DFAB - 230kW ASCO Transfer switch. The generator has a sub-base 120 gallon fuel tank designed to provide 12 hours fuel supply at full load. The engine generator starts immediately on loss of line power and remains running until line power is restored.

Control panel:
Manufactured by Technical Systems Inc.
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logics PLC with control set points input into PLC. In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. Both pumps run on a timer; timer setting is based on the rate the wet well pumps down.
Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio. This station receives stores and forwards radio telemetry data from pump station #20 to the plant.

Normal Auto Operation:
- Normal operation is with all both VFD’s displaying the letter “A” in the upper left hand corner of the display.
- Both pumps in the auto position on the control panel.

To manually run a pump using variable speed:
- Select the “Manual” button on the VFD keypad
- Push the start button
- Adjust VFD speed with the keypad up and down arrows
- Stop pump by and return to auto by pressing Automatic on the keypad.

With one pump out of service:
- Turn off breaker for out of service pump and tag out.
- PLC control system will automatically select lead and lag pumps based on which pumps are not in auto.
- Hand- Off- Auto switch in “Off” position for out of service pump(s)

Odor Control System:
Pump station 18 has caused a small number of odor complaints. Odor complaints must be investigated immediately. The stakes can be very high. The Northwest Clean Air Agency (NWCAA) has regulatory authority over odor complaints. In the early 1990’s the NWCAA threatened the City of Anacortes with a fine over $100,000 for complaints from home owners around pump station #15. The fine was avoided by working with the home owners and implementing a solution in a timely fashion.

When an odor complaint is received it should be investigated thoroughly. An odor complaint form (form # 0-13) must be filled out immediately. The person that registered the complaint must be treated with the utmost respect, even if they are angry and it is difficult to talk them. The person that is complaining may have been putting up with the odor problem for a long time before they were able to figure out who to call.

Odors in the collection system are not just a nuisance. The gas that causes most of the odor complaints is hydrogen sulfide or H2S. At high concentrations H2S can cause physical problems or death. H2S has been detected at levels between 200 and 300 ppm in the gravity collection system along Oakes Avenue. This is enough to begin to cause health problems in humans. It can also cause corrosion problems. In the environment of the sewer H2S will form sulfamic acid when combined with the moisture present on the interior surface of gravity sewer pipes. This acid is particularly corrosive to concrete.

The sewage pumped from this station is pumped through over 14,400 feet of pipe line containing ~21,000 gallons of sewage. The sewage in the pipe line is displaced as pump station 18 cycles on and off. Pump station 18 currently pumps approximately 16000 gallons per day. This sewage is detained in the force main for 1 and ½ days at average daily flow rates.

Sewage is full of organic material and micro-organisms. As the sewage is being detained in the pipeline the organisms consume the organic material. In order for the organisms to metabolize the food that has been consumed

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oxygen is required for respiration. Inside of the force main pipe there is little dissolved oxygen available and no access to any atmospheric source. The freely available oxygen is rapidly consumed. When the freely available dissolved oxygen is depleted classes of micro-organisms that are capable of anaerobic respiration will obtain oxygen by removing oxygen molecules from other chemical compounds.

Normally most or at least some of the oxygen used for anaerobic respiration comes from sulfide compounds, and as a by product of this respiration hydrogen sulfide, or H2S, formed. H2S is detected by people as the smell of rotten eggs. There are many other sources that bacteria will use to obtain chemically available oxygen; the result usually liberates a gas that causes odor complaints. For example, natural gas is odorless. Methyl mercaptan is added to natural gas to give it a distinctive odor. This allows people to detect a natural gas leak. Anaerobic respiration can release methyl mercaptan. Pump Station #15 has been reported to the gas company (at that time it was Cascade Natural Gas) as a natural gas leak. The gas company responded and could not find the source of the odor. The gas company technician suspected the sewer pump station as the cause and contacted the wastewater treatment plant. Methyl mercaptan was created in the Skyline Conveyance system in sufficient quantity to be detected by people and reported as a natural gas leak.

The odor control chemical feed system in use at pump station #18 is intended to provide an alternative source of oxygen. A proprietary chemical with the trade name Bioxide is being fed into the wet well. Bioxide is a calcium nitrate salt. The chemically bound oxygen from the Bioxide is easier for the micro-organisms to use than sulfides or other chemical compounds available in the sewage. When the micro-organisms strip the oxygen off of the Bioxide, nitrogen (a non-toxic and odorless gas) is released.

To measure the effectiveness of the odor control chemical feed system a portable data logging atmospheric H2S monitor is installed in MH C-16. This is the gravity transition manhole for a privately owned pump station at the RV Park as well as for pump station #18. The meter logs the level of H2S in the manhole every five minutes. This logged data is used to control the dosage of Bioxide at #18. H2S up to 10 ppm is generally considered to be acceptable and does not cause odor complaints. If H2S levels greater than 10ppm are being logged for more than one five minute data period the chemical feed rate may need to be adjusted. The operator will also need to
evaluate if the odor was most likely caused by station #18, or by the private station.

Odor Control chemical feed system components:

Two Snyder Industries 1000 gallon cross linked high density polyethylene vertical storage tank, equipped with Milltronics sonic level sensors
One Watson Marlow peristaltic pump
Fisher Rosemount Micro Motion Mass flow meter

The chemical feed pump runs at a constant rate 24 hours per day into the wet well. As the pumps cycle they help the bioxide mix with the sewage as it starts the day and a half journey thru the force main.
Pump Station #19
12493 Bartholomew Road

Originally installed in 2000, duplex pump station. **There is currently no inflow to this station.**

- Wet Well: 8’ diameter x 17.5' deep (879 cuft)
- Top Elevation: 73.36
- Bottom elevation: 55.86
- One 12” inlet line
- Wet well material of construction – polyurethane coated concrete.

Pumps:
- 2 each, Fairbanks Morse Model 3-A5431MT, Frame 140TY
- Impellor T3A1EP 5.00”
- 2 HP 460V 3 phase
- Full Load Amps 3.6
- RPM 1735
- Weight of pump: ~300 lb.

Control Points (high float measured from top of hatch gutter to top of float):
- Pumps off – 4.0’
- Abnormal Low 0.25’
- Lead Pump On -6.0’
- Lag Pump On -6.5’
- Abnormal High 8.5’
- High Level Float -112”

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Pump 1    Pump 2    Both
Typical amp-draw one pump running: 3.1    2.9
(3 Phase)    3.0    2.8
    2.9    2.7
Gallons per Minute (GPM):    188    188    220

Valve Vault:
Size 5’ x 6’ rectangular x 7’ deep (210cuft)
Gate Valves – 4”
Check Valves – 4” ball check

Force Main:
Pipe: 4” Ductile iron    Length: 272’
Discharges into gravity MH # W-24

Electrical Data:
Supply 480 Volt    Three Phase
Main disconnects located on the MCC.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 11.5 DNAD – 11.5kW
ASCO Transfer switch. The generator has a sub-base 41 gallon fuel tank designed to provide 24 hours fuel at full load.
The engine generator starts immediately on loss of line power and remains running until line power is restored

Control panel:
Manufactured by U. S. Filter/Consolidated Electric
Pressure transmitter/D152 control system The D152 controller starts and stops pump based on the position of movable pins.
In the event of a control system or D152 failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. One pump is run on a timer; timer setting is based on the rate the wet well pumps down.
Telemetry: Autocon Micro Cat 9710 RTU Johnson data radio.
Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio.

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Normal Operation:

- Both Hand-Off-Auto switches in the Auto position.
- The D-152-controller “Auto Alternator Control Switch” in the alternate position

With one pump out of service:

- Turn off breaker for out of service pump
- Hand-Off-Auto switch in Off position for out of service pump
- Select the in service pump to be the lead pump on the D152 controller
Originally installed in 2000, this is a duplex pump station, with an odor control chemical feed system. Control system upgrade to Micro Logics PLC in 2004.

Wet Well: 8' diameter x 17.25' deep (867 cuft)
Top Elevation: 15.57
Bottom elevation: -1.68
One 12” inlet line
Wet well material of construction – urethane coated concrete.

Pumps:
2 each, Fairbanks Morse Model 4D5433MV Frame 250T Impellor T4C1KL 11.60” 30 HP 460V 3 phase
Full Load Amps 33.8 RPM 1760 Weight of pump: 860 lb.

Control Points (high float measured from top of hatch gutter to top of float):
Pumps Off - 2.0’ Abnormal Low 1.0’
Lead Pump On -4.0’ Lag Pump On -5.0
Abnormal High 6.0 High Level Float -116”

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Typical amp-draw one pump running: 28.7 (3 Phase) 29.2 28.2

Gallons per Minute (GPM):

Pump 1 Pump 2 Both
518 471 534

Valve Vault:
Size 12’ x 10’ rectangular x 7’ 8” deep
Gate Valves – 6” Resilient wedge gate valve
Check Valves, 6” ball check

Force Main:
This station is equipped with operator selectable 5” or 6” or both HDPE force mains
Pipe: .5” or 6” HDPE Length: 5350’
Discharges into gravity MH # W-26

Electrical Data:
Supply 480 Volt Three Phase
Main disconnects located on the MCC.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 80 DGDA - 80kW
ASCO Transfer switch. The generator has a sub-base 173 gallon fuel tank designed to provide 24 hours fuel supply at full load.
The engine generator starts immediately on loss of line power and remains running until line power is restored

Control panel:
Manufactured by Technical Systems Inc
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logics PLC
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. Both pumps run on a timer; timer setting is based on the rate the wet well pumps down. All pump station control set points input into PLC.
Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio. This station transmits data to pump station #18, 18 receives, stores and forwards radio telemetry data to the plant.

Normal Operation:
- Normal operation is with both Hand-Off-Auto switches in the Auto position.

With one pump out of service:
- Turn off breaker for out of service pump and tag out.
- Hand- Off- Auto switch in Off position for out of service pump.

Odor Control System:

The odor control system is another bioxide feed system similar to the processes at PS 13, 14 and 18. The chemical feed pumps run when the pump station pumps run, mixing the bioxide with the station discharge.

Odor Control equipment:

Two “Chem Tainer” 500gallon cone bottom cross linked high density polyethylene vertical storage tanks
2 - Milltronics sonic level sensors
Two LMI model B721-925 chemical metering pumps
120V 60Hz 1.5A Max PSI 100.0
Max designed flow 2.5 gallons per hour
Fisher Rosemount Micro Motion Mass flow meter
Pump Station #21
2708 Fir Crest Drive

Originally installed in 2005, duplex pump station.

Wet Well: 6' diameter x 10' 6" deep (300cuft)
Top Elevation: 294.22
Bottom elevation: 283.72
One 8" inlet line
Wet well material of construction – concrete

Pumps:
2 each, Flygt Model 3127,090  Impellor #488
10 HP  460V  3 phase  Full Load Amps  13.0
RPM 1735  Weight of pump: 340 lb.

Control Points (high level float measured from top edge of hatch gutter):
Pumps Off – 0.5’  Abnormal Low 0.1’
Lead Pump On -3.0’  Lag Pump On -3.25’
Abnormal High 4.0  High Level Float -70”

Typical amp-draw one pump running: 6.6  6.5
(3 Phase)  6.7  7.0

City of Anacortes
Sanitary Sewer Plan 2014
Gallons per Minute (GPM):

<table>
<thead>
<tr>
<th></th>
<th>Pump 1</th>
<th>Pump 2</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>71</td>
<td>88</td>
<td>97</td>
</tr>
</tbody>
</table>

Valve Vault:
Size 11.5’ x 9’ rectangular x 8’ deep (828cuft)
Gate Valves – 4” Resilient wedge gate valve
Check Valves, 4” Flygt ball check

Force Main:
Pipe: 4” HDPE  Length: 645’
Discharges into gravity MH # E-262

Electrical Data:
Supply 480 Volt Three Phase
Main disconnects located on the back of the control enclosure.
Emergency power supplied by onsite engine generator with automatic transfer switch.
Standby Engine Generator: Cummins Onan Model 35 DGBB - 35kW ASCO Transfer switch. The generator has a sub-base fuel tank designed to provide 24 hours fuel supply at full load.
The engine generator starts immediately on loss of line power and remains running until line power is restored

Control panel:
Manufactured by Technical Systems Inc
Pressure transmitter wet well level control system.
All pump station functions controlled by Allen Bradley Micro Logics PLC and all pump station control set points input into PLC
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. Both pumps run on a timer; timer setting is based on the rate the wet well pumps down.

Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio.

City of Anacortes
Sanitary Sewer Plan 2014
Normal Operation:
  • Normal operation is with both Hand-Off-Auto switches in the Auto position.

With one pump out of service:
  • Turn off breaker for out of service pump and tag out.
  • Turn off breaker and tag out the corresponding pump
  • Hand-Off-Auto switch in off position for out of service pump.
Pump Station #22
1016 13th Street
Fire Department Parking Lot

Original installation was as part of the fire station construction and run by the fire department. The WWTP took control of the station with an upgrade of the controls and communication system in Jan 2009. It is a simplex pump station. The telemetry system also reports pump runs and high level conditions from the adjoining storm water pump station. The storm water wet well and discharge plumbing was replaced in October 2009.

**Sewage Pumping**

Wet Well:
Sewage Well 4’ in diameter x 7’3” deep (91 cuft)
Top Elevation: 14.0’
Bottom elevation: 6.75’
One 3” and one 6” inlet lines
Wet well material of construction: uncoated concrete.

Pumps:
1 each, Flygt Model #3085.891-0177 with a 258 impeller
4 HP 208V 3 phase  Full Load Amps 18.5

City of Anacortes

Sanitary Sewer Plan 2014
RPM 3415  Weight of pump: 117 lb. Normal running amps 11
A spare pump is kept at the main plant in the event of a pump failure

Control Points (high level float measured from top edge of hatch gutter):
Pump Start – 1.6’  Pump Stop – .5’
Abnormal High 1.7’  Abnormal Low 0.3’
Wet well High Level Float – 60”

Valve Vault:
None – Pump valving is in the wet well.

Force Main:
Pipe: 3” PVC discharging into the gravity sewer line between manholes L17 and L19.

Storm Water Pumping

Storm Water Wet Well:
4’ diameter x 12’ deep (192 cuft)
Top Elevation: 14.0’
Bottom elevation: 2.0’
Inlet invert: 6.42’
Storm wet well material of construction is uncoated concrete.

Storm Water Pump:
1 each Goulds Model #WS0511BF storm water pump
½ HP  115V  1 phase  Full Load Amps 14.5
RPM 1725
A spare pump is kept at the treatment plant in the event of pump failure.

Controls:
The pump runs on float controls in the wet well.
Levels are measured from the top of the wet well cover.
On level: 116”
Off Level: 131”
High Alarm Float: 96” (5” below the inlet pipe invert)
A small electrical junction box is located just south of the wet well.

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Sanitary Sewer Plan 2014
Valve Vault
None – the valves are in the wet well. A gate valve is on the 2” PVC discharge line and a check valve on the pump.

Storm Water Force Main:
The 2” PVC pump discharge line connects to the 2” hdpe force main running up the south side of the north driveway discharging into the storm sewer line at the end of the driveway on “O” Ave.

Common Elements to Both Storm and Sewer at the Station
Electrical Data:
Supply 208 Volt 3 Phase for the sewage pump
Supply 120 Volt Single Phase for the storm pump
Main disconnect located on pump station control panel support frame.
Emergency power is supplied thru the fire station emergency generator.

Control panel:
Assembled by TSI
Pressure transmitter wet well level control system. (using a Contegra level transmitter)
All pump station functions controlled by Allen Bradley Micro Logics 1100 PLC A VFD is used for speed control. A maple systems interface is used to enter control data.
In the event of a control system or PLC failure the control panel is equipped with a redundant control system. The redundant control is activated when the high level float is tripped. The pump is run on a timer; timer setting is based on the rate the wet well pumps down.
Telemetry: Direct Allen Bradley PLC communication, Johnson Integra Data Radio.

The control panel only supplies power to the storm water pump. The storm water pump runs on floats in the wet well. There is no back up control system on the storm water pump station. Pump runs are monitored by the control panel systems and are reported back to the main plant.
The storm water high level float initiates an alarm at the main plant but does not operate a back up system to run the pump
Storm water wet well high level float rings in at 96” from the top of the well. (72” from the bottom of the well)

Normal Operation:
City of Anacortes
Sanitary Sewer Plan 2014
• Hand-Off-Auto switch in the Auto position.
• The storm water pump runs off of the float in the well.

With one pump out of service:
• Both wells have only one pump. If either pump is out of service temporary pumping must be put in place on its wet well until the back up pump is installed. Back up pumps for both storm and sewer wells are kept in stock at the WWTP.
Pump Station #23
1915 13th St
Volunteer Park Ball Field

Outside Dome

Control Panel

City of Anacortes
Sanitary Sewer Plan 2014
Original installation was as part of the ball park upgrade and was run by the parks department. The WWTP took control of the station with an upgrade of the controls and communication system in Jan 2009.

Wet Well:
3' diameter x 5’ deep (35 cuft)
Top Elevation: 70.0’
Bottom elevation: 65.0’
One 4” inlet line
Wet well material of construction: fiberglass.

Pumps:
2 each, E/One Extreme Model AMPG progressive cavity pumps
1 HP 240V 1 phase Full Load Amps 8
RPM 1725 Weight of pump: ~125lb.
Each pump has an equalizer and an electrical quick disconnect at the top of the well. The equalizer references atmospheric pressure for the level sensors in the pumps. The quick disconnect allows for easy removal of the pump.
High torque, capacitor start, thermally protected

Control Points
The level control points including wet well high level are internal to each pump and are factory set.

Valve Vault:
None – the pump valving is in the wet well.

Force Main:
Pipe: 1 ¼” PVC discharge line. Each pump tees into a 2” common force main just outside of the wet well. The force main discharges into the 8” concrete gravity line in the alley between G Ave & H Ave – 12th St & 13th St, just east of manhole #S-061.

Electrical Data:
Supply 240 Volt 1 Phase
Main disconnect located at the control panel inside the restroom building adjacent to the pump station. The control panel room is on the north side of the building between the two restrooms. A parks department 4J1 key is needed to gain access to the room.

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Sanitary Sewer Plan 2014
This station has a UPS unit but no backup power service. In the event of a major power outage the restrooms that feed to the station will simply be locked closed.

Control panel:
E-One standard T260 240 volt Duplex Model with Run Time Dry Contacts w/ Sentry Enclosure
Auto alternate of the lead pump

Telemetry Panel
Assembled by TSI
- Maple systems interface
- Micro Logic 1100 for data collection and reporting
- Direct Allen Bradley PLC communication, Johnson Integra Data Radio.
- A UPS unit is supplied in this cabinet.

Normal Operation:
- Fully automated with no operator control. There is no manual run switch.

With one pump out of service:
- Shut down the breaker for the appropriate pump inside the E-One control panel.
ABBREVIATIONS

City
CSOs
Ecology
EPA
mgd
NMCS
NPDES
Orange Book
PCMP
SCADA
TSS
WAC
WWTP

City of Anacortes
combined sewer overflows
Washington State Department of Ecology
U.S. Environmental Protection Agency
million gallons per day
nine minimum controls
National Pollution Discharge Elimination System
Criteria for Sewage Works Design
post construction monitoring plan
supervisory control and data acquisition
Total Suspended Solids
Washington Administrative Code
wastewater treatment plant
1. Introduction
The City of Anacortes currently has two combined sewer overflow (CSO) locations as identified in the National Pollution Discharge Elimination System (NPDES) Permit issued to the City of Anacortes Wastewater Treatment Plant by Washington State Department of Ecology (Ecology). Both outfalls are controlled CSOs that satisfy the Washington State requirement of "greatest reasonable reduction" by meeting the standard of not more than one discharge event per outfall per year on average.

In response to requirements by Ecology, the City adopted a CSO Reduction Plan in 1990 and amended the plan in 2010. These plans document the efforts undertaken by the City to reduce and eliminate CSO events. The City has successfully eliminated one CSO outfall and controlled the other 2 outfalls to meet the State standard. This post construction monitoring plan (PCMP) describes monitoring protocols to verify the effectiveness of CSO controls, provides information for use in demonstrating compliance with State water quality standards and provides protection of designated uses.

2. Regulations
In Washington State, Ecology oversees the planning and design of CSO controls as identified in WAC 173-245, regulates post construction monitoring to ensure water quality standards are met as specified in WAC 173-201A and ensures sediment management standards are adhered to as specified in WAC 173-204.

The City of Anacortes NPDES Waste Discharge Permit No WA 0020257 (Ecology 2012) requires the City to develop PCMP to verify the effectiveness of CSO controls and demonstrate compliance with water quality standards and protection of designated uses:

The Permittee must submit to Ecology for review and approval a CSO Post Construction Monitoring Plan no later than June 30, 2015. The plan must describe the monitoring protocols to be followed, including effluent monitoring and, where appropriate, other monitoring protocols such as ambient monitoring, biological assessments, whole effluent toxicity testing, and sediment sampling.

Comprehensive guidance for CSO activities is provided by Ecology in the Criteria for Sewage Works Design (also referred to as the Orange Book, WAC 173-245-050), which states that "compliance with the state water quality standards is a requirement that must always be achieved" (C3-1.2.3).

Under the Federal CSO control policy (59 Federal Register,18688), U.S. Environmental Protection Agency (EPA) requires CSO communities to have a post construction monitoring program. Further guidance from EPA is given in the CSO Post Construction Compliance Monitoring Guidance, Section 3, Development of a Post Construction Compliance Monitoring Plan, U.S. Environmental Protection Agency (EPA 2012).

EPA and Ecology require CSO communities to implement the nine minimum controls (NMC) as an integral component of their CSO reduction program:

1. Proper operation and regular maintenance programs for the sewer system and CSOs;
2. Maximum use of the collection system for storage;
3. Review and modification of pretreatment requirements to assure CSO impacts are minimized;

City of Anacortes
CSO Post Construction Monitoring Plan

June 2015
4. Maximization of flow to the treatment plant for treatment;  
5. Prohibition of CSOs during dry weather;  
6. Control of solid and floatable materials in CSOs;  
7. Pollution prevention (programs that focus on contaminant reduction activities);  
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts; and  
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.

Under Ecology's guidance and management of the CSO control program, communities strive to achieve and at least maintain "the greatest reasonable reduction" of CSOs by reducing the average number of overflows to no more than one untreated event per year on average as specified in WAC 173-245-020(22). Any CSO which meets this standard is deemed a controlled CSO.

The City assumes the exemption to the mixing zone numeric size criteria as described in WAC 173-201A-400 to be applicable for each controlled CSO. Surface water quality standards are regarded as being met resulting from a mixing zone of unlimited extent and therefore no boundary at which point water quality standards would be achieved. Monitoring for these CSOs controls focuses on characterizing the quantity and duration of discharges.

3. CSO Background

Areas within the City of Anacortes are served by a partially combined sewer system where both the storm and sanitary sewer systems are joined. The City of Anacortes has two CSOs which have the potential to allow untreated wastewater combined with stormwater to discharge to Guemes Channel during extreme storm events. The CSOs are identified as CSO Outfall 002, the "B Avenue CSO" and CSO Outfall 004, the "Q Avenue CSO" (see Figure 1 Anacortes CSO LocationsFigure 1).

3.1. B Avenue CSO

The B Avenue CSO is located one-half block north of the intersection of B Avenue and 11th Street. Discharges from the CSO occur when combined stormwater and sanitary sewer levels rise high enough in the collection system to overflow a dam in the CSO manhole separating the manhole channel from the CSO outfall pipe (see Figure 2). Flow from the CSO is discharged into Guemes Channel through a 12-inch pipe to the outfall located at latitude 48.515278, longitude: -122.634167 as stated in the NPDES permit.

The CSO manhole is configured for flow to enter the manhole from a 12-inch diameter pipe where it is channeled past the overflow dam at an angle. The flow then "U-turns" towards Pump Station #3 through an 8-inch pipe. Pump Station #3 serves a residentially zoned drainage basin.

There has not been an overflow event at the B Avenue CSO since 1997 as the result of numerous improvements made to the system over many years. In 1992 the City constructed the Secondary Wastewater Treatment Plant which included an interceptor sewer system and additional pump stations to serve the west end (including Pump Station #15) and Skyline areas of Anacortes. Upon completion of the interceptor some of the flow from the drainage basin served by Pump Station #3 was diverted to the new system. In addition, in the late 1990s PS #3 was improved by replacing the pumps, installing new control panels, supplying generator power for emergency back up and adding radio telemetry to the City of Anacortes June 2015

CSO Post Construction Monitoring Plan
pump station. In 2005 improvements were made to PS #15 which included diverting more flow from the drainage basin served by PS #3 directly to PS #15. Further improvements over the years include projects removing stormwater from the collection system to reduce hydraulic loading on the system during high flow events. Despite the absence of overflow events and the numerous improvements to the system, the City has chosen to keep this CSO since it provides potential hydraulic relief for the drainage basin.

3.2. Q Avenue CSO

The Q Avenue CSO manhole is located at the intersection of 2nd Street and Commercial Avenue on Port of Anacortes property leased to Dakota Creek Industries, Inc. (DCI) who operates a shipyard on this site. This CSO is in a Residential/Commercial/Industrial zoned drainage basin. The outfall pipe is located at the northernmost end of Q Avenue directly underneath DCIs syncro lift facility which they use to haul large ships out of the water for maintenance. Discharges from this CSO occur when combined stormwater and sanitary sewer levels rise high enough in the collection system to overflow a concrete dam separating the manhole channel from the CSO outfall pipe in the CSO manhole (see Figure 3). Flow from the CSO is discharged into Guemes Channel through the outfall located at latitude: 48.521667, longitude: -122.609444 as stated in the NPDES permit.

The CSO manhole is configured for normal sewer flow to enter the manhole then make a 90-degree turn, heading south on Commercial Avenue. During extreme storm events when the collection system is at capacity, combined stormwater and sanitary sewer overflows the concrete dam enters a 24-inch pipe, heading east for one block to a manhole on 2nd and Q Avenue where it transitions to a 12-inch line then heads north to the discharge point. A photo showing the Q Avenue CSO manhole, including the concrete dam, can be seen in Figure 3. The end of the outfall is fitted with a duckbill valve located over the riprap under the syncro lift (see Figure 4).

A total of eight overflow events have occurred at the Q Avenue CSO in the last 19 years (since 1997). Numerous improvements have been made to the system to reduce CSO activity. In 1992 the City brought the Secondary Wastewater Treatment Plant on-line which included placing the new Skyline conveyance system in service. A significant amount of wastewater flow was diverted from the Q Avenue CSO manhole to the Skyline Conveyance system. In addition, in 1992 stormwater flows along Q Avenue were removed from the sanitary sewer and redirected to the stormwater collection system. Diversion of these flows significantly reduced the flow at the Q Avenue CSO and reduced the frequency of overflow events. With the Secondary Treatment Plant in operation, the peak influent pumping capacity increased from 4.5 mgd to 9.6 mgd. The City continues to focus on removing stormwater from the sanitary sewer and replacing compromised sewer lines.
Figure 1 - Anacortes CSO Locations
Figure 2 B Avenue CSO Manhole
Figure 3 Q Avenue CSO Manhole
Figure 4 Q Avenue CSO Outfall
4. CSO Event History

Table 1 summarizes CSO events from 1997 through 2015. There have been 2 CSO events at the B Avenue CSO and 8 CSO events at the Q Avenue CSO during this period of time.

Table 1. City of Anacortes Wastewater Collection System CSO History

<table>
<thead>
<tr>
<th>Date</th>
<th>Duration (hours)</th>
<th>Overflow Total (gallons)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/1997</td>
<td></td>
<td>42,033</td>
<td>Combined snow/rain storm event 12/23/96 to 1/2/97, snow 1.46 in snow, 0.65 in rain, total precipitation 2.11 inches</td>
</tr>
<tr>
<td>1/2/1997</td>
<td></td>
<td>22,492</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Duration (hours)</th>
<th>Overflow Total (gallons)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/1997</td>
<td></td>
<td>366,667</td>
<td>Combined snow/rain storm event 12/23/96 to 1/2/97, snow 1.46 in snow, 0.65 in rain, total precipitation 2.11 inches</td>
</tr>
<tr>
<td>1/2/1997</td>
<td></td>
<td>179,440</td>
<td></td>
</tr>
<tr>
<td>11/18/2003</td>
<td></td>
<td>648</td>
<td>0.2 hours, 11/17-11/18 2.51 in rain</td>
</tr>
<tr>
<td>1/2/2007</td>
<td>2.6</td>
<td>30,548</td>
<td>1.50 inches rain</td>
</tr>
<tr>
<td>1/5/2007</td>
<td>0.9</td>
<td>7,664</td>
<td>0.87 inches rain</td>
</tr>
<tr>
<td>1/7/2009</td>
<td>4.39</td>
<td>96,704</td>
<td>1/7 0.84 inches rain, 1/4 - 1/7 2.37 inches rain</td>
</tr>
<tr>
<td>12/12/2010</td>
<td>3.42</td>
<td>128,887</td>
<td>Dec 11-12 2.80 inches rain</td>
</tr>
<tr>
<td>1/5/2015</td>
<td>5.2</td>
<td>160,600</td>
<td>2.30 inches rain</td>
</tr>
</tbody>
</table>

5. CSO Monitoring

5.1. Overview

The B Avenue CSO and Q Avenue CSO both meet Washington State's criteria for the greatest reasonable reduction and therefore are classified as controlled CSOs. Application of the exemption to the numeric size criteria allowance listed in WAC 173-201A-400(11) results in a mixing zone of unlimited extent; therefore, water quality standards are regarded as being met. Consequently monitoring for these CSO controls focuses on characterizing the quantity and duration of discharges.

5.2. NPDES Permit Required Monitoring

NPDES Permit No. WA0020257, paragraph S2.A requires monitoring of CSOs as shown in Table 2. Automatic flow monitoring equipment is used to collect the data.
Table 2. Combined Sewer Overflows (CSO) Monitoring Schedule

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units &amp; Speciation</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSO discharge is defined as any untreated CSO which will exit or has exited the CSO outfall.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume Discharged</td>
<td>Gallons</td>
<td>Per Event ^a</td>
<td>Measurement/Calculation ^b</td>
</tr>
<tr>
<td>Discharge Duration</td>
<td>Hours</td>
<td>Per Event ^a</td>
<td>Measurement</td>
</tr>
<tr>
<td>Storm Duration</td>
<td>Hours</td>
<td>Per Event ^c</td>
<td>Measurement</td>
</tr>
<tr>
<td>Precipitation</td>
<td>Inches</td>
<td>Per Event ^a</td>
<td>Measurement/Calculation ^b</td>
</tr>
</tbody>
</table>

Footnotes for CSO Monitoring:

^a Per Event means a unique CSO event, defined as any 24-hour period when a CSO or multiple discharges occur.

^b Measurement/Calculation means the total volume of the discharge or amount of precipitation event as estimated by direct measurement or indirectly by calculation (i.e., flow wells, pressure transducers, tipping bucket). Precipitation must be measured by the nearest possible precipitation-measuring device to measure and report precipitation and actively monitor the device during the period of interest.

^c Storm duration is the amount of total time when precipitation occurred that contributed to a discharge event. It is determined on a case-by-case basis.

Source: National Pollutant Discharge Elimination System Waste Discharge Permit No. WA0020257 (Ecology 2012)

5.3. Flow Monitoring

The B Avenue CSO flow meter, installed in the outfall pipe at the CSO manhole, measures level and velocity and transmits flows to the treatment plant via a radio telemetry system. Data is recorded by the WWTP supervisory control and data acquisition (SCADA) system.

A float switch installed in the Q Avenue CSO manhole activates when the level in the sewer system approaches the height of the overflow dam. When the float switch activates, it sends an alarm to the WWTP alerting personnel of impending CSO activity. The CSO flow meter, installed in a manhole directly east of the CSO manhole, measures the flow as it passes through the meter and transmits data to the treatment plant via a radio telemetry system. Data is recorded by the WWTP SCADA system.

5.4. Sediment Monitoring

Given the absence of a single CSO event at the B Avenue CSO in the past 18 years, it is reasonable to presume there is no effect on sediment quality resulting from activity originating from this CSO. In addition, during development of the City's CSO Reduction Plan, evaluation of receiving water sediments at the CSO outfalls was attempted. Several parties, including Ecology, were present to witness this effort. The conclusion for the B Avenue CSO, by all parties present following these efforts, was that due to the exact location of the outfall being unknown, the apparent location and depth of the outfall and the presence of significant tides and currents, substantial sedimentation would not be possible at this location. This coupled with the absence of any overflow events in the past 18 years makes it reasonable to advocate that sediment monitoring for this CSO is not pursued unless circumstances change in the future.

The Q Avenue CSO outfall discharges directly above riprap under DCIs synchro lift in a location where no sediments have been observed during inspections of the outfall (see Figure 4). The end of the outfall pipe is fitted with a duckbill valve to prevent seawater from backing up into the CSO outfall. Given the location and lack of sediments at the outfall sampling is not warranted at this site.
5.5. Water Quality Monitoring

CSO discharge water quality is expected to be virtually identical, or more diluted, to that measured at the influent to the WWTP. Influent monitoring at the WWTP includes total suspended solids (TSS) and pH, along with other parameters not specifically required for a CSO event. A scum baffle is installed in the Q Avenue CSO manhole to prevent solid and floatable material from entering the CSO pipe.

6. Nine Minimum Controls (NMC) for CSOs

The nine minimum controls for CSOs incorporated into the CSO Reduction Plan are follows:

1. **Proper operation and regular maintenance programs for the sewer system and CSOs:**
   The City has a maintenance and inspection program to reduce the magnitude, frequency, and duration of CSO events. The City flushes and vacuums debris from the sewer lines annually. In addition, the City regularly inspects the sewer system through TV inspection, smoke testing, manhole inspections, and catch basin inspections. These inspections help identify and remove connections of storm to the sewer system and identify future construction projects.

2. **Maximum use of the collection system for storage:**
   The City has increased the storage of the collection system by raising the heights of the overflow dams and overflow pipe inverters since the 1990 CSO Reduction Plan and 2010 CSO Reduction Plan Amendment. In addition, the City has separated flows from a number of portions of the sewer system. Wastewater flows in areas with little or no additional capacity during storm events have been directed into flow basins that have additional capacity increasing the overall storage capacity of the collection system. These changes along with other measures taken by the City have helped to reduce the magnitude, frequency, and duration of CSO events.

3. **Review and modification of pretreatment requirements to assure CSO impacts are minimized:**
   The City has a pretreatment ordinance defined in the City of Anacortes Municipal Code. The pretreatment ordinance lists requirements for industrial users to treat their waste prior to discharging to the City's sewer collection system and to maintain their treatment system. The treating of nondomestic wastewater prior to entering the City's collection system will reduce the amount of pollutants discharged during potential CSO events and minimize the impacts.

4. **Maximization of flow to the treatment plant for treatment:**
   The City's WWTP is rated for 9.6 MGD. During extreme wet weather flow conditions, the WWTP has operated at up to 10.3 to 10.5 MGD to keep up with flows through the collection system and reduce CSO events.

5. **Prohibition of CSOs during dry weather:**
   The City has made improvements to the system so that overflow events only occur during extreme wet weather conditions. Should an overflow occur during dry weather conditions, the City shall immediately notify Washington State Department of Ecology. The City will monitor the frequency and duration of the flow event with the flow meter installed and begin corrective action to end the overflow event.

6. **Control of solid and floatable materials in CSOs:**
   The City has raised the height of the overflow dams and overflow pipe inverters to reduce the amount of solid and floatable materials that can overflow. The City has installed a scum baffle to reduce the amount of solids and floatable materials that can overflow at the Q Avenue CSO.
7. **Pollution prevention (programs that focus on contaminant reduction activities):**
   The City has a section of their Municipal Code which is called “General Discharge Prohibitions.” This section of code lists all the materials and requirements for materials that are prohibited from being discharged to the sewer system. In addition, the City municipal code has a pretreatment program as discussed above. Lastly, the Municipal code requires grease interceptors in new businesses or retrofitting them into existing businesses when a new building permit application has been submitted. All these sections of the municipal code are portions of the program to prevent pollutants from entering the sewer system and potentially being discharged into receiving waters during CSO events.

8. **Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts:**
   Any time a CSO occurs, the City notifies Washington State Department of Health, Skagit County Department of Health, and the shellfish program of the Washington State Department of Health. The flow meters installed at each of the CSO locations measure the amount and duration of the CSO event. The annual CSO report is made available to the public either electronically on the City’s website or in written form upon request.

9. **Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls:**
   When a CSO event occurs, the City monitors the quantity and duration of the discharge throughout the event. Water quality is monitored at the WWTP throughout the event. Each of the CSO outfalls discharge to Guemes Channel which supports transportation and fisheries resources. Salmon and other fishing is popular in the area. In addition, Burrows Bay several miles southwest of the outfalls has a significant shellfish population. Lastly, Washington Park is located west of the CSO outfalls and includes a bathing beach that is used more frequently during the summer. Guemes Channel water quality is listed as Class A by the Washington State Department of Ecology which is defined as Excellent Quality as defined by Water Quality for Marine Standards. No impacts have been observed or identified from any of the CSO discharge events.
7. References


CITY OF ANACORTES
Skagit County, Washington

COMBINED SEWER OVERFLOW
REDUCTION PLAN AMENDMENT

JULY 2010
G&O #10472

Gray & Osborne, Inc.
CONSULTING ENGINEERS
August 18, 2010

Mr. John Franz
Wastewater Treatment Plant Manager
City of Anacortes
904 6th Street
Anacortes, WA 98221

Subject: Approval of CSO Reduction Plan Amendment for the City of Anacortes

Dear Mr. Franz:

In accordance with the Revised Code of Washington (RCW) 90.48, and Washington Administrative Code (WAC) 173-245, the Department hereby APPROVES the CSO Reduction Plan Amendment dated July 2010.

Nothing in this approval shall be construed as satisfying other applicable federal, state or local statutes, ordinances or regulations.

If you have any questions or need any additional information, please contact Tonya Lane of my staff at (425) 649-7050 or by email at tlane461@ecy.wa.gov.

Sincerely,

Kevin C. Fitzpatrick
Water Quality Manager
Northwest Regional Office

cc: Adam Miller, Gray & Osborne, Inc.
August 18, 2010
Mr. John Franz
Approval of CSO Reduction Plan Amendment
Page 2 of 2

Mailed to:
MR. JOHN FRANZ
WASTEWATER TREATMENT PLANT MANAGER
CITY OF ANACORTES
904 6TH STREET
ANACORTES, WA 98221

MR. ADAM MILLER, P.E.
GRAY AND OSBORNE, INC.
701 DEXTER AVE N.
SEATTLE, WA 98109
July 13, 2010

Mr. John Franz
Wastewater Treatment Plant Manager
City of Anacortes
904 6th Street
Anacortes, Washington 98221

SUBJECT:  COMBINED SEWER OVERFLOW REDUCTION PLAN AMENDMENT
          CITY OF ANACORTES, SKAGIT COUNTY, WASHINGTON
          G&O #10472.00

Dear Mr. Franz:

This Combined Sewer Overflow Reduction Plan Amendment was prepared to meet the requirements of the City’s NPDES permit. As a condition of the City’s application for renewal, the City is required to submit a Combined Sewer Overflow Reduction Plan Amendment to the Washington State Department of Ecology for its review and approval. The amendment is intended to comply with the requirements of WAC 173-245-090(2). Additionally, the amendment discusses the conditions of the original Combined Sewer Overflow Plan per the requirements of WAC 173-245-040. The amendment discusses projects the City has performed since the original plan and prioritizes projects for continued combined sewer overflow reduction.

Please contact the undersigned if you have any questions.

Very truly yours,

GRAY & OSBORNE, INC.

[Signature]

Adam Miller, P.E.

AJM/hhj

Encl.

cc:  Ms. Tonya Lane, Washington State Department of Ecology
     Mr. Eric Shjarback, Assistant City Engineer, City of Anacortes
CITY OF ANACORTES
SKAGIT COUNTY
WASHINGTON

COMBINED SEWER OVERFLOW REDUCTION
PLAN AMENDMENT

JULY 2010
G&O #10472

Gray & Osborne, Inc.
CONSULTING ENGINEERS
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<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Q Avenue CSO Photos</td>
<td>2</td>
</tr>
</tbody>
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APPENDICES

Appendix A – City of Anacortes NPDES Permit
Appendix B – WAC 173-245-090(2)
Appendix C – Sewer Capital Facilities Plan (2011-2016)
INTRODUCTION

BACKGROUND

In 1990, the City of Anacortes submitted a Combined Sewer Overflow (CSO) Reduction Plan to Washington State Department of Ecology. The CSO Reduction Plan included documentation and monitoring requirements and a schedule for reducing CSO events. The City is currently in the process of applying for a renewal for the Wastewater Treatment Plant NPDES permit. As a requirement for the NPDES permit renewal, the City is required to submit a CSO Reduction Plan Amendment that complies with the requirements of WAC 173-245-090(2). The City’s NPDES permit and the WAC Code can be seen in Appendix A and B respectively.

This CSO Reduction Plan Amendment (Amendment) expands on the 1990 CSO Reduction Plan per the NPDES permit requirements. The Amendment will assess the effectiveness of the existing 1990 plan to date and list planned future CSO reduction projects. In addition, the Amendment will evaluate compliance with the nine minimum controls as described in the City’s NPDES permit. Lastly, the Amendment will reevaluate the CSO sites project priority ranking.

COMBINED SEWER OVERFLOWS

The City of Anacortes has three combined sewer overflow (CSO)s which have the potential to discharge untreated wastewater and stormwater as a result of precipitation events. The location of the CSOs can be seen in Figure 1 and are described in Table 1 below.

<table>
<thead>
<tr>
<th>Discharge No.</th>
<th>Location</th>
<th>Receiving Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>B Avenue CSO</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td>003</td>
<td>M Avenue CSO</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td>004</td>
<td>Q Avenue CSO</td>
<td>Guemes Channel</td>
</tr>
</tbody>
</table>

The City has worked with Washington State Department of Ecology in the 1990 CSO plan to monitor and provide sediment sampling downstream of the CSOs and to establish baseline CSO volumes and frequency. The City has permanent flow meters installed at each of the CSO structures to measure CSO activity. The flows are reported and discussed in the annual CSO reports as submitted to Washington State Department of Ecology.
B Avenue CSO

The B Avenue CSO is located at the northern end of B Avenue approximately 180 feet north of 11th Street as shown in Figure 2. The wastewater in this basin flows north on B Avenue into manhole #U6-017 to the west of Pump Station No. 3, then east into the Pump Station No. 3 wet well. If the Pump Station No. 3 wet well backs up, the wastewater flow backs up the 8-inch sewer line to the B Avenue CSO manhole #U6-016. The overflow pipe is a 12-inch concrete line to the northwest out of the CSO that flows into Guemes Channel. The overflow pipe is separated from the wastewater flows through the manhole by a concrete overflow dam with a weir for flow measurement. The flow meter measures the levels and velocity of the overflow and transmits this data to the WWTP. A photo showing the B Avenue CSO structure including the dam and overflow weir structure can be seen in Figure 3.

M Avenue CSO

The M Avenue CSO is located in manhole #S-002 at the northern end of M Avenue at the intersection with 4th Street as shown in Figure 4. The overflow outlet of this structure flowed to the east into a flow meter vault. A pressure transducer flow meter is installed in the overflow vault to monitor the overflow events frequency and volume of wastewater discharged. During overflow events, wastewater flowed through the flow meter vault and entered the existing 15-inch concrete storm drain that flows north to Guemes Channel. The overflow out of the M Avenue CSO has recently been plugged by the City between the CSO structure and the flow meter vault. The City decided to decommission the M Avenue CSO because flows and overflow events have been greatly reduced since the 1990 CSO Reduction Plan. The M Avenue CSO has not had an overflow event since 1997. Since the M Avenue CSO has been decommissioned, we will remove it from further CSO discussions after this Amendment.

Q Avenue CSO

The Q Avenue CSO is located at the intersection of 2nd Street and Commercial Avenue in manhole R-012 as shown in Figure 5. The overflow pipe is separated from the wastewater flows through the manhole by a concrete overflow dam. A photo showing the Q Avenue CSO structure with the dam can be seen in Figure 6. A float switch installed in this CSO structure monitors the flow and transmits this data to the WWTP. The overflow pipe from the manhole is a 24-inch concrete pipe flowing to the east. Approximately 20-feet east of the CSO structure is a manhole with a flow meter for flow measurement. The flow is measured with a magnetic flow meter and the flow passes through the meter. The flows continue to the east into the DCI ship building property and into manhole #R-009. The flows turn north out of manhole #R-009 and through a 12-inch line flowing to Guemes Channel.
CITY OF ANACORTES
CSO REDUCTION PLAN AMENDMENT

FIGURE 6
Q AVENUE CSO PHOTOS

LEVEL FLOOD

OVERFLOW DAM

FLOW CHANNEL
ASSESSMENT OF 1990 CSO REDUCTION PLAN

The City has successfully followed the strategy developed in the 1990 CSO Reduction Plan to separate combined sewers throughout the City and reduce the number of overflow events and quantity of wastewater released. Permanent flow meters have been installed at all three of the overflow structures to measure any overflow events. The City has constructed the capital improvements projects outlined in the 1990 CSO Reduction Plan. They have continued additional capital improvement projects and developed an annual maintenance and inspection program to reduce CSO events.

COMPLETED CSO REDUCTION PROJECTS 1990-2010

As discussed above, the City has accomplished the projects detailed in the 1990 CSO Reduction Plan. The City has followed an aggressive schedule to reduce the frequency and volume of CSO events through construction projects. The projects include; separating areas of combined sewer and storm, disconnecting roof drains and other sources of storm from the sewer, replacing and lining sections of old and leaky pipe, replacement and lining of old and leaky manholes, and increasing capacity of pump stations and the WWTP. In general, the City has made an effort to perform one or two construction projects every year that reduce CSO events. The projects that have been completed since the 1990 CSO Reduction Plan can be seen in Table 2 below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-1994</td>
<td>Separated a combined sewer system on O Avenue.</td>
</tr>
<tr>
<td>1990-1994</td>
<td>Replaced an existing leaky deteriorated sewer through an alley between 9th and 10th Streets from F Avenue to M Avenue.</td>
</tr>
<tr>
<td>1990-1994</td>
<td>Constructed a new West Anacortes Pump Station and diverted some of the flow from the existing B Avenue Pump Station to the new pump station to reduce overflow events. This project facilitated additional storage in the collection system, one of the nine minimum controls.</td>
</tr>
<tr>
<td>1990-1994</td>
<td>Constructed new Wastewater Treatment Plant that has a greater flow treatment capacity. This project permitted the City to operate the WWTP at maximum flow, one of the nine minimum controls.</td>
</tr>
<tr>
<td>1990-1994</td>
<td>Restructured the channel of the M Avenue Overflow manhole to provide for straighter and smoother flow through the manhole and reduce splashing over the overflow. Raised the overflow weir 12” permitting additional storage in the collection system, one of the nine minimum controls.</td>
</tr>
</tbody>
</table>
TABLE 2 – (continued)

Completed CSO Reduction Projects (1990-2010)

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>Improved the B Avenue CSO vault and improved the accuracy of the flow meter.</td>
</tr>
<tr>
<td>1990-1994</td>
<td>Rerouted a portion of the wastewater flows from the drainage basin served by the B Avenue Overflow manhole to the Skyline Conveyance system drainage basin by adding a new manhole and 40 lineal feet of 12&quot; PVC gravity sewer pipe.</td>
</tr>
<tr>
<td>1990-1994</td>
<td>Rerouted a portion of the wastewater flows from the drainage basin served by the Q Avenue Overflow manhole to the Skyline Conveyance system drainage basin. This project permitted additional storage in the collection system, one of the nine minimum controls.</td>
</tr>
<tr>
<td>1995</td>
<td>Moved the M Avenue CSO to the intersection of M Avenue and 4th Street which eliminated splashing over the dam at the existing overflow structure. The new overflow structure increased laminar flows through the structure. Installed a new overflow vault with a flow meter to accurately measure overflow quantities and frequencies. Raised the height of the overflow weir permitting additional storage in the collection system, one of the nine minimum controls.</td>
</tr>
<tr>
<td>1996</td>
<td>Lined sewer trunk and grouted and sealed a number of manholes flowing into Pump Station No. 4.</td>
</tr>
<tr>
<td>1996</td>
<td>Installed telemetry at Pump Station No. 3 improving reliability, alarm system function and thereby reducing CSO events.</td>
</tr>
<tr>
<td>1997</td>
<td>Disconnected a stormwater catch basin from sewer and connected to storm drainage.</td>
</tr>
<tr>
<td>1997</td>
<td>Installed new flow meter on B Avenue CSO for improved reliability, real-time flow reporting and alarm.</td>
</tr>
<tr>
<td>1998</td>
<td>Modified the WWTP to collect and record information from CSOs.</td>
</tr>
<tr>
<td>1998</td>
<td>Purchased additional flow meters for an infiltration and inflow study to identify stormwater entering the sewer system.</td>
</tr>
<tr>
<td>1999</td>
<td>Moved the Q Avenue CSO out of the DCI ship building property and into the public right-of-way at the intersection of 2nd Street and Commercial Avenue. Improved the overflow dam and installed a new manhole with a flow meter to accurately measure overflow quantities and frequencies.</td>
</tr>
<tr>
<td>1999</td>
<td>Storm pipe installed on Q Avenue between 7th and 8th Streets. Roof drains in this area were disconnected from sewer and connected to the new storm pipe.</td>
</tr>
</tbody>
</table>
TABLE 2 -- (continued)

Completed CSO Reduction Projects (1990-2010)

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>Improvements to Pump Station No. 3 greatly increasing pump station reliability including a standby emergency generator to keep the PS in operation in the event that power fails.</td>
</tr>
<tr>
<td>2000</td>
<td>Replaced Pump Station No. 3 force main and redirected to Pump Station No. 15 removing flows from the drainage basin served by the M Avenue CSO.</td>
</tr>
<tr>
<td>2000</td>
<td>Repaired 3 badly leaking manholes with fiberglass and epoxy.</td>
</tr>
<tr>
<td>2000</td>
<td>Replaced approximately 985 lineal feet of old, damaged, and leaky sanitary sewer pipe.</td>
</tr>
<tr>
<td>2001</td>
<td>Replaced approximately 1,200 lineal feet of old, damaged, and leaky sanitary sewer pipe.</td>
</tr>
<tr>
<td>2001</td>
<td>Installed a new storm drain with a sidewalk project in the Central Business District and connected 6 roof drains to the storm pipe that were contributing to the elevated ground water levels.</td>
</tr>
<tr>
<td>2002</td>
<td>Lined 2,875 lineal feet of old damaged leaky sanitary sewer pipe with cured-in-place pipe.</td>
</tr>
<tr>
<td>2003</td>
<td>Slilined 642 lineal feet of damaged leaky sanitary sewer pipe.</td>
</tr>
<tr>
<td>2003</td>
<td>Replaced one block of sidewalks in the Central Business District and removed roof drains from large commercial building connected to sewer and connected them to the storm sewer.</td>
</tr>
<tr>
<td>2004</td>
<td>Sealed two manholes with excessive infiltration using a chemical grout injection process.</td>
</tr>
<tr>
<td>2004</td>
<td>Replaced three blocks of leaking sewer pipe in alleys. Pipe was replaced from Q Avenue to R Avenue between 21st and 22nd Street. Pipe was replaced from Q Avenue to R Avenue between 27th and 28th Street. Pipe was replaced from Commercial Avenue to Q Avenue between 22nd and 23rd Street.</td>
</tr>
<tr>
<td>2004</td>
<td>Replaced one block of sidewalks in the Central Business District and removed roof drains from commercial buildings connected to sewer and connected them to the storm sewer.</td>
</tr>
<tr>
<td>2006</td>
<td>Replaced 695 lineal feet of old 8&quot; sewer line, 345 lineal feet of 12&quot; sewer line with PVC sewer and replaced 5 old leak manholes with new manholes.</td>
</tr>
<tr>
<td>2006</td>
<td>Replaced one block of sidewalks in the Central Business District on Commercial Avenue from 9th Street to 10th Street and removed roof drains from two commercial buildings and one parking lot connected to sewer and connected to storm sewer.</td>
</tr>
</tbody>
</table>
TABLE 2 – (continued)

Completed CSO Reduction Projects (1990-2010)

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Removed storm sewer directly connected to the sewer system. The storm sewer served a three square block area, Commercial Avenue to O Avenue and from 10th Street to 13th Street. This project is in the downtown area and is mostly impervious surface.</td>
</tr>
<tr>
<td>2007</td>
<td>Replaced 370 lineal feet of old leaky 6&quot; clay sewer pipe, 696 lineal feet of 8&quot; old leaky clay and concrete sewer pipe, and 345 lineal feet of old leaky 12&quot; clay and concrete sewer pipe with new PVC pipe. Replaced 7 old manholes with new manholes.</td>
</tr>
<tr>
<td>2007</td>
<td>Replaced one block of sidewalks in the Central Business District on Commercial Avenue from 10th Street to 11th Street and removed a large commercial parking lot storm drainage system connected to sewer and connected to the storm sewer.</td>
</tr>
<tr>
<td>2008</td>
<td>Lined 2,743 lineal feet of old sewer pipe in the &quot;L&quot; drainage basin with cured-in-place pipe. Lined 10 leaking manholes in the &quot;L&quot; drainage basin.</td>
</tr>
<tr>
<td>2008</td>
<td>Replaced one block of sidewalks in the Central Business District on Commercial Avenue from 3rd Street to 4th Street and installed a new storm drainage catch basin to collect storm drainage piping that was connected to the sanitary sewer system.</td>
</tr>
<tr>
<td>2009</td>
<td>Replaced approximately 4,500 lineal feet of old clay and concrete sewer pipe and 16 manholes in the &quot;L&quot; drainage basin.</td>
</tr>
<tr>
<td>2010</td>
<td>Installed plug in the overflow pipe out of the M Avenue CSO. This project essentially decommissions the M Avenue CSO.</td>
</tr>
</tbody>
</table>

MAINTENANCE AND INSPECTION ACTIVITIES

In addition to construction projects to reduce CSO events, the City has developed a maintenance and inspection program to reduce CSO events and identify areas for future construction projects.

Flushing/Vactoring

As part of the City’s annual program, the main sewer lines are flushed and vactored to remove accumulated debris every year. The City has noticed that some of the main sewer lines upstream from the CSOs can accumulate debris. The debris reduces the capacity of the sewer lines during storm events and periods of high flow causing overflow events to occur. The City has noticed that the frequency of the overflow events is decreased if the
sewer lines have been flushed of debris. Therefore, the flushing and vactoring of the sewer lines has become an annual maintenance exercise to reduce CSO events.

TV Inspection

The City has a TV inspection program with the goal to inspect one sewer drainage basin each year. The overall goal is to inspect the entire sewer system. The City owns a track mounted robotic inspection camera for use in the TV inspection. The TV inspection results are used to locate storm and sewer cross connections and to identify old, damaged, or leaky pipe and manholes for future repair projects. In addition, the City performs television inspection on all new sewer pipes and manholes.

Smoke Testing

The City has smoke testing equipment and uses the equipment prior to construction projects to identify locations where storm lines and roof drains are connected to the sewer system. The City does not have a set schedule for smoke testing, but performs it in areas where problems are suspected. The smoke testing is often done in areas where future projects are planned to locate storm connected to the sewer system. The smoke testing has resulted in locating a number of storm systems in the downtown area that were connected to the sewer system. The City has reconnected these storm systems to the storm drainage system in conjunction with recent sidewalk improvement projects in the downtown area.

Manhole Inspection

The City performs manhole inspection prior to construction projects during periods of high groundwater to see if leaks can be located. Manholes that have been identified as problem areas during TV inspection are inspected by city crews from the surface. The manhole inspections are often done in areas where future projects are planned.

Storm Pipe/Catch Basin Inspection

The City performs television inspection on all new stormwater pipes and catch basins.

FUTURE PROJECTS

The City has continued to plan future projects for the improvements to the sewer system and the reduction of CSO events. A number of the projects that will help reduce CSO events will be performed by the City’s crew in 2010. In addition, some of the larger planned construction projects are detailed in the City’s annual Capital Facilities Plan (CFP). The City’s 2011-2016 CFP will be adopted in the summer of 2010 and includes approximately $9,742,500 for improvements to the sewer system. The planned projects that will help reduce CSO events are listed in Table 3 below. The CFP including all the projects, estimated costs, and the years to be constructed can be seen in Appendix C.
TABLE 3

Future Sewer System Improvement Projects

<table>
<thead>
<tr>
<th>CFP No.</th>
<th>Project Name</th>
<th>Benefits</th>
<th>Planned Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Q Avenue CSO Basin Storage Analysis</td>
<td>Increase wastewater storage capacity of Q Avenue drainage basin and prevent overflows and backups</td>
<td>2011</td>
</tr>
<tr>
<td>N/A</td>
<td>Q Avenue CSO Scum Baffle</td>
<td>Scum baffle will control solid and floatable materials in the CSO and prevent overflows and backups</td>
<td>2011</td>
</tr>
<tr>
<td>N/A</td>
<td>Pump Station No. 3 Scum Baffle</td>
<td>Scum baffle will control solid and floatable materials in the PS from entering the B Avenue CSO and prevent overflows and backups</td>
<td>2011</td>
</tr>
<tr>
<td>SC-006</td>
<td>Sewer Line Rehabilitation</td>
<td>Prevent sewer backups and overflow events</td>
<td>2011</td>
</tr>
<tr>
<td>SC-022</td>
<td>Sewage Collection System Manhole Repairs</td>
<td>Prevent sewer backups and overflow events</td>
<td>2011</td>
</tr>
<tr>
<td>SC-028</td>
<td>Infiltration &amp; Inflow Reduction</td>
<td>Reduce flows and prevent sewer backups and overflow events</td>
<td>2011</td>
</tr>
<tr>
<td>SPS-302</td>
<td>PS Data Acquisition System Improvements</td>
<td>Improve PS data and control</td>
<td>2011</td>
</tr>
<tr>
<td>SPS-502</td>
<td>Replace PS #7</td>
<td>Improve PS reliability which will prevent overflow events</td>
<td>2014</td>
</tr>
<tr>
<td>SPS-503</td>
<td>Refurbish PS #2</td>
<td>Improve PS to prevent overflow events</td>
<td>2015</td>
</tr>
<tr>
<td>SPS-600</td>
<td>PS Upgrades</td>
<td>Improve PS reliability and O&amp;M resulting in reduced overflow events</td>
<td>2015</td>
</tr>
<tr>
<td>STP-601</td>
<td>PLC Migration</td>
<td>Improve alarms at WWTP which will result in reduced overflow events</td>
<td>2011</td>
</tr>
<tr>
<td>STP-704</td>
<td>PS #6 Elimination</td>
<td>Eliminate PS reducing potential for overflow events</td>
<td>2014</td>
</tr>
<tr>
<td>STP-709</td>
<td>Cap Sante Sewer Extension</td>
<td>Prevent leaching of untreated wastewater to Fidalgo Bay</td>
<td>2015</td>
</tr>
</tbody>
</table>
NINE MINIMUM CONTROLS COMPLIANCE

In accordance with WAC 173-245, the City implemented and documented Nine Minimum Controls for CSOs in the 1990 CSO Reduction Plan. As stated in the City’s NPDES permit, compliance with the Nine Minimum Controls is to be documented in the CSO Reduction Plan Amendment. Compliance with the Nine Minimum Controls is discussed for each individual control as follows.

1. *The Permittee shall implement proper operation and maintenance programs for the sewer system and all CSO outfalls to reduce the magnitude, frequency, and duration of CSOs. The program shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.*

The City has a maintenance and inspection program to reduce the magnitude, frequency, and duration of CSO events. The City flushes and vacuums debris from the sewer lines annually as discussed above. In addition, the City regularly inspects the sewer system through TV inspection, smoke testing, manhole inspections, and catch basin inspections. These inspections help identify and remove connections of storm to the sewer system and identify future construction projects.

2. *The Permittee shall implement procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.*

The City has increased the storage of the collection system by raising the heights of the overflow dams and overflow pipe inverters since the 1990 CSO Reduction Plan. In addition, the City has separated flows from a number of portions of the sewer system. Wastewater flows in areas with little or no additional capacity during storm events have been directed into flow basins that have additional capacity increasing the overall storage capacity of the collection system. These changes along with other measures taken by the City have helped to reduce the magnitude, frequency, and duration of CSO events.

3. *The Permittee shall review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from the discharges from nondomestic users.*

The City has a pretreatment ordinance defined in the City of Anacortes Municipal Code. The pretreatment ordinance lists requirements for industrial users to treat their waste prior to discharging to the City’s sewer collection system and maintain their treatment system. The treating of nondomestic wastewater prior to entering
the City's collection system will reduce the amount of pollutants discharged during potential CSO events and minimize the impacts.

4. The Permittee shall operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The Permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.

The City’s WWTP is rated for 9.6 MGD. During extreme wet weather flow conditions the WWTP has operated at up to 10.3 to 10.5 MGD to keep up with flows through the collection system and reduce CSO events.

5. Dry weather overflows from CSO outfalls are prohibited. Each dry weather overflow must be reported to the permitting authority as soon as the Permittee becomes aware of the overflow. When the Permittee detects a dry weather overflow, the Permittee shall begin corrective action immediately. The Permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.

The City has made improvements to the system so that overflow events only occur during extreme wet weather conditions. Should an overflow occur during dry weather conditions, the City shall notify Washington State Department of Ecology immediately. The City will monitor the frequency and duration of the flow event with the flow meter installed and begin corrective action to end the overflow event.

6. The Permittee shall implement measures to control solid and floatable materials in CSOs.

The City has raised the height of the overflow dams and overflow pipe inverts to reduce the amount of solid and floatable materials that can overflow. The City has projects planned to install scum baffles to reduce the amount of solids and floatable materials that can overflow at both the B Avenue and Q Avenue CSOs.

7. The Permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

The City has a section of their Municipal Code which is called “General Discharge Prohibitions.” This section of code lists all the materials and requirements for materials that are prohibited from being discharged to the sewer system. In addition, the City municipal code has a pretreatment program as discussed above. Lastly, the Municipal code requires grease interceptors in new businesses or retrofitting them into existing businesses when a new building permit application has been submitted. All these sections of the municipal code are portions of the
program to prevent pollutants from entering the sewer system and potentially being discharged into receiving waters during CSO events.

8. The Permittee shall implement a public notification process to inform the citizens of when and where CSOs occur. The process must include (a) a mechanism to alert persons of the occurrence of CSOs and (b) a system to determine the nature and duration of conditions that are potentially harmful for users of receiving waters due to CSOs.

Any time a CSO occurs, the City notifies Washington State Department of Health, Skagit County Department of Health, and the shellfish program of the Washington State Department of Health. The flow meters installed at each of the CSO locations measure the amount and duration of the CSO event.

9. The Permittee shall monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls. This shall include collection of data that will be used to document the existing baseline conditions, evaluate the efficacy of the technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. These data shall include:

a. Characteristics of combined sewer system including the population served by the combined portion of the system and locations of all CSO outfalls in the CSS;
b. Total number of CSO events and the frequency and duration of CSOs for a representative number of events;
c. Locations and designated uses of receiving water bodies;
d. Water quality data for receiving water bodies; and
e. Water quality impacts directly related to CSO (e.g., beach closing, floatables, wash-up episodes, fish kills).

The characteristics and populations served by each of the CSO outfalls are seen in Table 4. As can be seen in the Table below, the B Avenue serves a residential area. The M Avenue CSO also served a residential area, but this CSO has been decommissioned. The Q Avenue CSO primarily serves a residential area with wastewater flows from only a few businesses including Trident Seafoods and a tank farm.

<table>
<thead>
<tr>
<th>CSO</th>
<th>Population Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Avenue</td>
<td>Residential</td>
</tr>
<tr>
<td>M Avenue</td>
<td>Residential-Decommissioned</td>
</tr>
<tr>
<td>Q Avenue</td>
<td>Residential/Commercial/Industrial</td>
</tr>
</tbody>
</table>

TABLE 4

CSO Characteristics
b. The number of CSO events and frequency of the events are examined from the records for the last 10 years from 1999-2009. The results are seen in Table 5 below. As can be seen in the Table, the B Avenue and M Avenue CSOs have not been active in the last 10 years. The B Avenue provides potential hydraulic relief during sewer backups, so the City has decided to keep this CSO. The M Avenue has recently been decommissioned. Only the Q Avenue CSO has been active in the last 10 years. The Q Avenue CSO experiences an average of one overflow event every two years or 0.5 events/year.

**TABLE 5**

**CSO Frequency**

<table>
<thead>
<tr>
<th>Year</th>
<th>B Avenue CSO Events</th>
<th>M Avenue CSO (Decommissioned) Events</th>
<th>Q Avenue CSO Events</th>
<th>Volume Discharged (gal.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>96,704</td>
</tr>
<tr>
<td>2008</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>38,212</td>
</tr>
<tr>
<td>2007</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>648</td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>Not Avail.</td>
</tr>
<tr>
<td>1999</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>0 events/yr</td>
<td>0 events/yr</td>
<td>0.5 events/yr</td>
<td></td>
</tr>
</tbody>
</table>

c. Each of the CSO outfalls discharge to Guemes Channel which supports transportation and fisheries resources. Salmon and other fishing is popular in the area. In addition, Burrows Bay several miles southwest of the outfalls has a significant shellfish population. Lastly, Washington Park is located west of the CSO outfalls and includes a bathing beach that is used more frequently during the summer.

d. Guemes Channel water quality is listed as Class A as ranked by the Washington State Department of Ecology. Class A is defined as Excellent Quality as defined by Water Quality for Marine Standards.

e. No impacts have been observed or identified from any of the CSO discharge events.
PROJECT PRIORITY RANKING

The City has followed the strategy developed in the 1990 CSO Reduction Plan to separate the combined sewers through the use of Capital Facilities Projects, maintenance, and inspection. They have accomplished all the priority projects as listed in the 1990 CSO Reduction Plan and have continued with the construction of numerous projects to separate the combined sewers and reduce the frequency and volume of CSO discharge events as seen in Table 2. The City has continued development of future plans to separate the combined sewers and reduce CSO events through maintenance, inspection and construction projects performed by City staff. In addition they have planned sewer improvement construction projects as listed in the Capital Facilities Plan.

The priority projects are discussed more below and can be seen in Table 6.

Q AVENUE CSO BASIN STORAGE ANALYSIS

This project will look at the Q Avenue CSO basin to determine if the collection system can be configured to allow for additional storage of wastewater, one of the nine minimum controls. Elevations of the sewer entering the collection system of several key businesses will be checked and compared with the overflow weir elevation in the Q Avenue CSO. The City believes that the Q Avenue overflow weir can be raised. Raising the weir will increase the amount of wastewater storage in the collection system and reduce the magnitude, frequency, and duration of CSO events.

Q AVENUE CSO SCUM BAFFLE

This project will construct a scum baffle to control solid and floatable materials in the Q Avenue CSO, one of the nine minimum controls. The scum baffle will prevent floatable materials from overflowing the weir and being discharged to Guemes Channel.

PUMP STATION NO. 3 SCUM BAFFLE

This project will construct a scum baffle to control solid and floatable materials in Pump Station No. 3, which flows to the B Avenue CSO. Reducing solid and floatable materials in the CSO is one of the nine minimum controls. The scum baffle will prevent floatable materials from overflowing the weir and being discharged to Guemes Channel.
### TABLE 6

**Priority CSO Reduction Projects**

<table>
<thead>
<tr>
<th>Priority</th>
<th>Project Name</th>
<th>Benefits</th>
<th>Planned Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Q Avenue CSO Basin Storage Analysis</td>
<td>Increase wastewater storage capacity of Q Avenue drainage basin and prevent overflows and backups</td>
<td>2011</td>
</tr>
<tr>
<td>2</td>
<td>Q Avenue CSO Scum Baffle</td>
<td>Scum baffle will control solid and floatable materials in the CSO and prevent overflows and backups</td>
<td>2011</td>
</tr>
<tr>
<td>3</td>
<td>Pump Station No. 3 Scum Baffle</td>
<td>Scum baffle will control solid and floatable materials in the PS from entering the B Avenue CSO and prevent overflows and backups</td>
<td>2011</td>
</tr>
</tbody>
</table>
APPENDIX A

CITY OF ANACORTES NPDES PERMIT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT No. WA-002025-7

State of Washington
DEPARTMENT OF ECOLOGY
Northwest Regional Office
3190 160th Avenue SE
Bellevue, Washington 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 1251 et seq.

CITY OF ANACORTES
P.O. Box 547
Anacortes, Washington 98221

<table>
<thead>
<tr>
<th>Plant Location:</th>
<th>Receiving Water:</th>
</tr>
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<tbody>
<tr>
<td>500 T Avenue</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td>Anacortes, Washington 98221</td>
<td></td>
</tr>
<tr>
<td>Water Body I.D. No.:</td>
<td>Discharge Location:</td>
</tr>
<tr>
<td>WA-03-0020</td>
<td>Latitude: 48° 31' 23&quot; N</td>
</tr>
<tr>
<td>Plant Type:</td>
<td>Longitude: 122° 36' 31&quot; W</td>
</tr>
<tr>
<td>Activated Sludge</td>
<td></td>
</tr>
</tbody>
</table>

is authorized to discharge in accordance with the Special and General Conditions that follow.

Kevin C. Fitzpatrick
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology
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<th>First Submittal Date</th>
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<td>Monthly</td>
<td>October 15, 2005</td>
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<td>Noncompliance Notification</td>
<td>As necessary</td>
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</tr>
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<td>S3.G.</td>
<td>Shellfish Protection</td>
<td>As necessary</td>
<td></td>
</tr>
<tr>
<td>S4.B.</td>
<td>Plans for Maintaining Adequate Capacity</td>
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<td>April 30, 2008</td>
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<td>October 31, 2008</td>
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<td>Chemical Analysis of Influent and Effluent</td>
<td>1/quarter</td>
<td>February 24, 2010</td>
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<td>S12.B.</td>
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<td>Annually</td>
<td>April 15, 2006</td>
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<tr>
<td>S12.C.</td>
<td>Combined Sewer Overflow Reduction Plan Amendment</td>
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<td>April 15, 2007,</td>
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<td></td>
<td></td>
<td></td>
<td>February 24, 2010</td>
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<td>1/permit cycle</td>
<td>February 24, 2010</td>
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<tr>
<td>G22.</td>
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</table>
SPECIAL CONDITIONS

S1. DISCHARGE LIMITATIONS

A. Effluent Limitations

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

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Average Monthly</th>
<th>Average Weekly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonaceous Biochemical Oxygen Demand</td>
<td>25 mg/L, 938 lbs/day 85% removal of influent BOD</td>
<td>40 mg/L, 1501 lbs/day</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>30 mg/L, 1126 lbs/day 85% removal of influent TSS</td>
<td>45 mg/L, 1689 lbs/day</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>200/100 mL</td>
<td>400/100 mL</td>
</tr>
<tr>
<td>pH</td>
<td>Daily minimum is equal to or greater than 6.0 and the daily maximum is less than or equal to 9.0.</td>
<td></td>
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Parameter Average Monthly Maximum Daily

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Average Monthly</th>
<th>Maximum Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Residual Chlorine</td>
<td>189 µg/L</td>
<td>494 µg/L</td>
</tr>
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</table>

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

*b The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For other units of measurement, the daily discharge is the average measurement of the pollutant over the day.

*c This effluent limit applies whenever chlorine is used in the facility. If no chlorine is used during the monitoring period, enter "no discharge of chlorine" on the DMR for the period.
B. Mixing Zone Descriptions

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

1. The horizontal dimensions and boundaries of the mixing zone are as depicted in the following diagram:

![Diagram of mixing zone](image)

The mixing zone extends vertically from the outfall to an upper boundary at the water surface. The most restrictive upper boundary occurs at Mean Lower Low Water (MLLW). The CCEC is equal to 1.23%.

2. The allowable zone of acute criteria exceedance dimensions and boundaries are depicted in the diagram above by the shaded area. The zone of acute criteria exceedance extends to an upper boundary surface at MLLW and shall not extend horizontally more than 23.1 feet from the diffuser. The ACEC is equal to 3.22%.

3. Note: The mixing zone diagram is schematic in nature and does not account for the boundary restricted by the pier.
S2. MONITORING REQUIREMENTS

A. Monitoring Schedule

The Permittee shall monitor in accordance with the following schedule:

<table>
<thead>
<tr>
<th>Category</th>
<th>Parameter</th>
<th>Units</th>
<th>Sample Point</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
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</thead>
<tbody>
<tr>
<td>Wastewater Influent</td>
<td>BOD₅</td>
<td>mg/l</td>
<td></td>
<td>2/30</td>
<td>24 HC</td>
</tr>
<tr>
<td></td>
<td>CBOD</td>
<td>mg/l</td>
<td></td>
<td>3/7</td>
<td>24 HC</td>
</tr>
<tr>
<td></td>
<td>TSS</td>
<td>mg/l</td>
<td></td>
<td>3/7</td>
<td>24 HC</td>
</tr>
<tr>
<td>Wastewater Effluent</td>
<td>Flow</td>
<td>MGD</td>
<td></td>
<td>7/7</td>
<td>Cont.</td>
</tr>
<tr>
<td></td>
<td>CBOD</td>
<td>mg/l</td>
<td></td>
<td>3/7</td>
<td>24 HC</td>
</tr>
<tr>
<td></td>
<td>TSS</td>
<td>mg/l</td>
<td></td>
<td>3/7</td>
<td>24 HC</td>
</tr>
<tr>
<td></td>
<td>pH</td>
<td></td>
<td></td>
<td>7/7</td>
<td>Grab</td>
</tr>
<tr>
<td></td>
<td>Chlorine</td>
<td>µg/l</td>
<td></td>
<td>7/7</td>
<td>Grab</td>
</tr>
<tr>
<td></td>
<td>Fecal Coliform</td>
<td>Org./100 ml</td>
<td></td>
<td>3/7</td>
<td>Grab</td>
</tr>
<tr>
<td>Acute Toxicity Testing</td>
<td>WET Testing-Acute</td>
<td></td>
<td></td>
<td>Twice in year 2008</td>
<td>24 HC</td>
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<tr>
<td>Chronic Toxicity Testing</td>
<td>WET Testing-Chronic</td>
<td></td>
<td></td>
<td>Twice in year 2008</td>
<td>24 HC</td>
</tr>
<tr>
<td>Additional Chemical Analysis of Influent and Effluent</td>
<td>Priority Pollutant Metals</td>
<td></td>
<td></td>
<td>Quarterly in year 2008</td>
<td>24 HC</td>
</tr>
</tbody>
</table>

B. Sampling and Analytical Procedures

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

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

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the quantity of monitored flows. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements is consistent with the accepted industry standard for that type of device. Frequency of calibration shall be in conformance with manufacturer's recommendations and at a minimum frequency of at least one calibration per year. Calibration records shall be maintained for at least three (3) years.

D. Laboratory Accreditation

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

S3. REPORTING AND RECORDKEEPING REQUIREMENTS

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

A. Reporting

The first monitoring period begins on the effective date of the permit. Monitoring results shall be submitted monthly. Monitoring data obtained during the previous month shall be summarized, reported, and submitted on a form provided, or otherwise approved, by the Department, and be received no later than the 15th day of the month following the completed reporting period, unless otherwise specified in this permit. Priority pollutant analysis data shall be submitted no later than 45 days following the monitoring period. The report(s) shall be sent to the Department of Ecology, Northwest Regional Office, 3190 160th Avenue S.E., Bellevue, Washington 98008-5452.

All lab reports providing data for organic and metal parameters shall include the following information: sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), lab practical quantitation limit (PQL), reporting units, and concentration detected.
B. Records Retention

The Permittee shall retain records of all monitoring information for a minimum of three (3) years. Such information shall include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by the Department.

C. Recording of Results

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

D. Additional Monitoring by the Permittee

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

E. Noncompliance Notification

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

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the violation, and correct the problem;

2. Repeat sampling and analysis of any violation and submit the results to the Department within thirty (30) days after becoming aware of the violation;

3. Immediately notify the Department of the failure to comply; and

4. Submit a detailed, written report to the Department within thirty (30) days (five days for upsets and bypasses), unless requested earlier by the Department. The report should describe the nature of the violation, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of the resampling, and any other pertinent information.

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. Maintaining a Copy of This Permit

A copy of this permit must be kept at the treatment plant and be made available upon request to the public or Ecology inspectors.

G. Reporting - Shellfish Protection

Unauthorized discharges, such as collection system overflows, plant bypasses, or failure of the disinfection system, shall be reported immediately to the Department of Ecology and the Department of Health, Shellfish Program. The Department of Ecology's Northwest Regional Office 24-hr. number is 425-649-7000, and the Department of Health's Shellfish 24-hr. number is 360-236-3330.

S4. FACILITY LOADING

A. Design Criteria

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

Average flow for the maximum month: 4.5 MGD
BOD₅ loading for maximum month: 6,400 lb/day
TSS loading for maximum month: 6,400 lb/day

B. Plans for Maintaining Adequate Capacity

The Permittee shall submit to the Department a plan and a schedule for continuing to maintain capacity 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. When the projected increase would reach design capacity within five years,

whichever occurs first. If such a plan is required, it shall contain a plan and schedule for continuing to maintain capacity. The capacity as outlined in this plan must be sufficient to achieve the effluent limitations and other conditions of this permit. This plan shall address any of the following actions or any others necessary to meet the objective of maintaining capacity.

1. Analysis of the present design including the introduction of any process modifications that would establish the ability of the existing facility to achieve the effluent limits and other requirements of this permit at specific levels in excess of the existing design criteria specified in paragraph A above.
2. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system.

3. Limitation on future sewer extensions or connections or additional waste loads.

4. Modification or expansion of facilities necessary to accommodate increased flow or waste load.

5. Reduction of industrial or commercial flows or waste loads to allow for increasing sanitary flow or waste load.

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

C. Notification of New or Altered Sources

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

S5. OPERATION AND MAINTENANCE

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

A. Certified Operator

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

B. O & M Program

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

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

D. **Electrical Power Failure**

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

E. **Prevent Connection of Inflow**

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

F. **Bypass Procedures**

The Permittee shall immediately notify the Department of any spill, overflow, or bypass from any portion of the collection or treatment system.

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

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

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

This bypass is permitted only if:

a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.

b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.

c. The Department is properly notified of the bypass as required in Condition S3E of this permit.

3. Bypass which is anticipated and has the potential to result in noncompliance of this permit.

The Permittee shall notify the Department at least thirty (30) days before the planned date of bypass. The notice shall contain: (1) a description of the bypass and its cause; (2) an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing; (3) a cost-effectiveness analysis of alternatives including comparative resource damage assessment; (4) the minimum and maximum duration of bypass under each alternative; (5) a recommendation as to the preferred alternative for conducting the bypass; (6) the projected date of bypass initiation; (7) a statement of compliance with SEPA; (8) a request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated; and (9) steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

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

a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.

b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment downtime, or transport of untreated wastes to another treatment facility.

c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

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

G. Operations and Maintenance Manual

The approved Operations and Maintenance Manual shall be kept available at the treatment plant and all operators shall follow the instructions and procedures of this manual.

The O&M Manual shall include:

1. Emergency procedures for plant shutdown and cleanup in event of wastewater system upset or failure;

2. Plant maintenance procedures; and

3. The treatment plant process control monitoring schedule.

S6. PRETREATMENT

A. General Requirements

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

Significant industrial users (SIUs) shall not be allowed to discharge wastes to the Permittee's sewerage system until they have received prior authorization from the Department in accordance with Chapter 90.48 RCW and Chapter 173-216 WAC, as amended. The Permittee shall immediately notify the Department of any proposed new sources, as defined in 40 CFR 403.3(k), from significant commercial or industrial operations.

C. General Prohibitions

In accordance with 40 CFR 403.5(a), a nondomestic discharger may not introduce into the Permittee’s sewerage treatment system any pollutant(s) that cause pass-through or interference.

D. Specific Prohibitions

In accordance with 40 CFR 403.5(b), the following nondomestic discharges shall not be discharged into the Permittee’s sewerage treatment system.

1. Pollutants that 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).

2. 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.

3. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.

4. Any pollutant, including oxygen-demanding pollutants, (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

5. Petroleum oil, nonbiodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass-through.

6. 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.

7. Heat in amounts that will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities such that the temperature at the POTW headworks exceeds 40° C (104° F) unless the Department, upon request of the Permittee, approves, in writing, alternate temperature limits.

8. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.
E. Notification of Industrial User Violations

The Permittee shall notify the Department if any nondomestic user violates the prohibitions listed in S6.C and S6.D above.

F. Industrial User Survey

If required by the Department, the Permittee shall perform an industrial user survey, or other activities (e.g., sewer use ordinance and local limits development), which are necessary for the proper administration of the state pretreatment program.

S7. RESIDUAL SOLIDS

Residual solids include screenings, grit, scum, primary sludge, waste activated sludge, and other solid waste. The Permittee shall store and handle all residual solids in such a manner so as to prevent their entry into state ground or surface waters.

S8. COMPLIANCE SCHEDULE

The City of Anacortes shall submit for approval submittals for the project that would eliminate influent related flow blending until the influent flow exceeds the hydraulic capacity (7.8 MGD) of the secondary process:


3. Completion of all work associated with this project—December 15, 2008.

S9. ACUTE TOXICITY

A. Testing Requirements

The Permittee shall test final effluent for acute toxicity in January 2008 and in July 2008 and submit the results of the testing to the Department within ninety (90) days of the test date. Testing shall be conducted on each of the two species listed below on each test date. The Permittee shall conduct acute toxicity testing on a series of five concentrations of effluent and a control in order to be able to determine appropriate point estimates and an NOEC. The series must include the ACEC of 3.22% as the minimum concentration and 100% effluent. The percent survival in 100% effluent shall also be reported.
Acute toxicity tests shall be conducted with the following species and protocols:

1. Fathead minnow, *Pimephales promelas* (96-hour static-renewal test, method: EPA/600/4-90/027F)

2. Daphnid, *Ceriodaphnia dubia, Daphnia pulex, or Daphnia magna* (48-hour static test, method: EPA/600/4-90/027F).

B. Sampling and Reporting Requirements

1. All reports for whole effluent toxicity tests shall be submitted in accordance with the most recent Department of Ecology specifications regarding format and content. Reports shall contain bench sheets and reference toxicant results for test methods. The effluent and reference toxicant test results shall also be submitted as electronic files on floppy disks in the Toxicity Standardized Electronic Reporting Format (TSERF) or other compatible format.

2. Testing shall be conducted on 24-hour composite effluent samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.

3. All samples taken for toxicity testing shall have ammonia, chlorine, pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured prior to test initiation.

4. All toxicity tests shall meet quality assurance criteria in the most recent versions of the EPA manual listed in Subsection A and the Department of Ecology Publication # WQ-R-95-80, *Whole Effluent Toxicity Testing Regulatory Guidance and Test Review Criteria*. If test results are determined to be invalid or anomalous by the Department, testing shall be repeated with freshly collected effluent. If control performance does not meet protocol standards for acceptability, the test shall be repeated with freshly collected effluent.

5. Control water and dilution water shall be laboratory water or pristine natural water meeting the requirements of the EPA manual listed in Subsection A. Dilution water for toxicity testing shall be of sufficient quality for good control performance.

6. The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.

7. All whole effluent toxicity tests that involve hypothesis testing and do not comply with the acute statistical power standard of 29% as defined in WAC 173-205-020 must be repeated on a fresh sample with an increased number of replicates to increase the power.
S10. CHRONIC TOXICITY

A. Testing Requirements

The Permittee shall test final effluent for chronic toxicity in January 2008 and in July 2008 and submit the results of the testing to the Department within ninety (90) days of the test date. All of the chronic toxicity tests listed below shall be conducted on each sample for each species.

The Permittee shall conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control in order to be able to determine appropriate point estimates and an NOEC. This series of dilutions shall include the acute critical effluent concentration (ACEC). The series of concentrations shall include the ACEC of 3.22% effluent and the CCEC of 1.23% effluent. The Permittee shall compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.

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

<table>
<thead>
<tr>
<th>Saltwater Chronic Toxicity Test Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mysid shrimp</td>
<td><em>Mysidopsis bahia</em></td>
</tr>
<tr>
<td>Silverside minnow</td>
<td><em>Menidia beryllina</em></td>
</tr>
</tbody>
</table>

B. Sampling and Reporting Requirements

1. All reports for whole effluent toxicity testing shall be submitted in accordance with the most recent Department of Ecology specifications regarding format and content. Reports shall contain bench sheets and reference toxicant results for test methods. The effluent and reference toxicant test results shall also be submitted as electronic files on floppy disks in the Toxicity Standardized Electronic Reporting Format (TSERF) or other compatible format.

2. Testing shall be conducted on 24-hour composite effluent samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.

3. All samples taken for toxicity testing shall have ammonia, chlorine, pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured prior to test initiation.

4. All toxicity tests shall meet quality assurance criteria in the most recent versions of the EPA manual or other test method listed in Subsection A and the Department of Ecology Publication # WQ-R-95-80, Whole Effluent Toxicity Testing Regulatory Guidance and Test Review Criteria. If test results are determined to be invalid or anomalous by the Department, testing shall be repeated with freshly collected effluent. If control performance does not meet protocol standards for acceptability, the test shall be repeated with freshly collected effluent.
5. Control water and dilution water shall be laboratory water or pristine natural water meeting the requirements of the EPA manual listed in Subsection A. Dilution water for toxicity testing shall be of sufficient quality for good control performance.

6. The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.

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

S11. ADDITIONAL CHEMICAL ANALYSIS OF INFLUENT AND EFFLUENT

A. General Requirements

The Permittee shall conduct chemical analyses of influent and effluent samples collected from the wastewater treatment system in accordance with protocols, monitoring requirements, and QA/AC procedures specified in this section.

B. Monitoring Requirements

The following seven analyses are identified in Part B of Form 2A NPDES. The seven parameters shall be tested on the Permittee’s final effluent on a calendar quarterly basis during the year 2008:

- Ammonia (as N)
- Dissolved Oxygen
- Total Kjeldahl Nitrogen (TKN)
- Nitrate + Nitrite Nitrogen
- Oil & Grease
- Total Phosphorus
- Total Dissolved Solids (TDS)

Also, effluent testing for the parameters identified in Part D of Form 2A NPDES shall be sampled on a calendar quarterly basis in the year 2008 to assist in determining if any changes in effluent characteristics have occurred.

The data shall be submitted with the Application for Permit Renewal.

C. Protocols

Sample analysis shall be conducted in accordance with 40 CFR Part 136.

D. Quality Assurance/Quality Control Procedures

The Permittee shall follow the quality assurance procedures of 40 CFR Part 136.
S12. COMBINED SEWER OVERFLOWS

A. Discharge Locations

The following is a list of combined sewer overflows (CSOs), which are occasional point sources of pollutants as a result of precipitation events. Discharges from these sites are prohibited except as a result of and during precipitation events. No authorization is given by this permit for discharge from a CSO that causes adverse impacts that threaten characteristic uses of the receiving water as identified in the Water Quality Standards, Chapter 173-201A WAC.

<table>
<thead>
<tr>
<th>DISCHARGE NO.</th>
<th>LOCATION</th>
<th>RECEIVING WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>B Avenue CSO</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td>003</td>
<td>M Avenue CSO</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td>004</td>
<td>Q Avenue CSO</td>
<td>Guemes Channel</td>
</tr>
</tbody>
</table>

B. Combined Sewer Overflow Report

By April 15, 2006, and annually thereafter, the Permittee shall submit a CSO Report to the Department for review and approval, which complies with the requirements of WAC 173-245-090(1).

C. Combined Sewer Overflow Reduction Plan Amendment

By April 15, 2007, and again with the Permit Application for Renewal, the Permittee shall submit an amendment of its CSO Reduction Plan to the Department for review and approval. The amendment shall comply with the requirements of WAC 173-245-090(2). The amendment shall consider all information, including the Combined Sewer Overflow Reduction Plan, CSO Annual Reports, 1985 Storm Drainage Program (Phase III-Capital Improvement Program), and 1985 Wastewater Facilities Plan. The amendment shall identify projects and establish construction/implementation dates.

D. Nine Minimum Controls

In accordance with WAC 173-245 and US EPA CSO control policy (59 FR 18688), the Permittee must implement and document the following nine minimum controls (NMC) for CSOs. Compliance with the NMC shall be documented in the Combined Sewer Overflow Reduction Plan Amendment (S12.C). Progress toward complying with controls shall be included in the annual combined sewer overflow reports required in S12.B.

The Permittee shall comply with the following technology-based requirements:

1. The Permittee shall implement proper operation and maintenance programs for the sewer system and all CSO outfalls to reduce the magnitude, frequency, and duration of CSOs. The program shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.
2. The Permittee shall implement procedures that will maximize use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency, and duration of CSOs.

3. The Permittee shall review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from the discharges from nondomestic users.

4. The Permittee shall operate the POTW treatment plant at maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency, and duration of CSOs. The Permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.

5. Dry weather overflows from CSO outfalls are prohibited. Each dry weather overflow must be reported to the permitting authority as soon as the Permittee becomes aware of the overflow. When the Permittee detects a dry weather overflow, the Permittee shall begin corrective action immediately. The Permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.

6. The Permittee shall implement measures to control solid and floatable materials in CSOs.

7. The Permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

8. The Permittee shall implement a public notification process to inform the citizens of when and where CSOs occur. The process must include (a) a mechanism to alert persons of the occurrence of CSOs and (b) a system to determine the nature and duration of conditions that are potentially harmful for users of receiving waters due to CSOs.

9. The Permittee shall monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls. This shall include collection of data that will be used to document the existing baseline conditions, evaluate the efficacy of the technology-based controls, and determine the baseline conditions upon which the long-term control plan will be based. These data shall include:
   a. Characteristics of combined sewer system including the population served by the combined portion of the system and locations of all CSO outfalls in the CSS;
   b. Total number of CSO events and the frequency and duration of CSOs for a representative number of events;
   c. Locations and designated uses of receiving water bodies;
   d. Water quality data for receiving water bodies; and
   e. Water quality impacts directly related to CSO (e.g., beach closing, floatables, wash-up episodes, fish kills).
S13. WET WEATHER OPERATION

When the flow rate to the POTW as a result of a precipitation event exceeds 5.5 MGD, a CSO-related bypass of the secondary treatment portion of the Anacortes Plant is authorized until December 15, 2008, when work identified in S8 is scheduled for completion. After this date, a CSO-related bypass of the secondary treatment portion of the Plant is authorized when the flow rate to the POTW as a result of a precipitation event exceeds 7.8 MGD. Bypasses that occur when the flow at the time of the bypass is under the specified flow rate are not authorized under this condition and are subject to the bypass provisions as stated in S5.F of the permit. In the event of a CSO-related bypass authorized under this condition, the Permittee shall minimize the discharge of pollutants to the environment. At a minimum, CSO-related bypass flows must receive primary clarification, solids and floatables removal, and disinfection. The final discharge must at all times meet effluent limitations of this permit as listed in S1.

The Permittee shall maintain records of all CSO-related bypasses at the treatment plant. These records shall document the duration and the dates of the bypassing, and the magnitude of the precipitation event. All occurrences of bypassing must be reported. The above information shall be included in narrative form with the discharge monitoring report.

S14. OUTFALL EVALUATION

The Permittee shall inspect once during the life of this permit, the submerged portion of the outfall line and diffuser and the CSO outfall lines to document their integrity and continued function. The inspection report shall be submitted to the Department in conjunction with the permit application. If conditions allow for a photographic verification, it shall be included in the report.

S15. STORM WATER

The Permittee shall apply for coverage either under the Industrial Stormwater General Permit or apply for coverage under an individual permit.
GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

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

A. All permit applications shall be signed by either a principal executive officer or a ranking elected official.

B. All reports required by this permit and other information requested by the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Department.

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

C. Changes to authorization. If an authorization under paragraph B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph B.2 above must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
G2. RIGHT OF INSPECTION AND ENTRY

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

A. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.

B. To have access to and copy - at reasonable times and at reasonable cost - any records required to be kept under the terms and conditions of this permit.

C. To inspect - at reasonable times - any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.

D. To sample or monitor - at reasonable times - any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G3. PERMIT ACTIONS

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

A. The following are causes for terminating this permit during its term, or for denying a permit renewal application:

1. Violation of any permit term or condition.

2. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.

3. A material change in quantity or type of waste disposal.

4. A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations and can only be regulated to acceptable levels by permit modification or termination [40 CFR part 122.64(3)].

5. A change in any condition that requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit [40 CFR part 122.64(4)].

6. Nonpayment of fees assessed pursuant to RCW 90.48.465.

7. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.
B. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:

1. A material change in the condition of the waters of the state.
2. New information not available at the time of permit issuance that would have justified the application of different permit conditions.
3. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.
4. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.
5. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR part 122.62.
6. The Department has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.
7. Incorporation of an approved local pretreatment program into a municipality’s permit.

C. The following are causes for modification or alternatively revocation and reissuance:

1. Cause exists for termination for reasons listed in A1 through A7 of this section, and the Department determines that modification or revocation and reissuance is appropriate.
2. The Department has received notification of a proposed transfer of the permit. A permit may also be modified to reflect a transfer after the effective date of an automatic transfer (General Condition G8) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new permittee.

G4. REPORTING PLANNED CHANGES

The Permittee shall, as soon as possible, but no later than sixty (60) days prior to the proposed changes, give notice to the Department of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in: 1) the permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b); 2) a significant change in the nature or an increase in quantity of pollutants discharged; or 3) a significant change in the Permittee’s sludge use or disposal practices. Following such notice, 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 of the terms and conditions of this permit.
G5. PLAN REVIEW REQUIRED

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

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

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

G7. DUTY TO REAPPLY

The Permittee shall apply for permit renewal at least one hundred and eighty (180) days prior to the specified expiration date of this permit.

G8. TRANSFER OF THIS PERMIT

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

A. Transfers by Modification

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

B. Automatic Transfers

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

1. The Permittee notifies the Department at least thirty (30) days in advance of the proposed transfer date.

2. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.

3. The Department does not notify the existing Permittee and the proposed new Permittee of its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.
G9. REDUCED PRODUCTION FOR COMPLIANCE

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

G10. REMOVED SUBSTANCES

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

G11. DUTY TO PROVIDE INFORMATION

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

G12. OTHER REQUIREMENTS OF 40 CFR

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

G13. ADDITIONAL MONITORING

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

G14. PAYMENT OF FEES

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

G15. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to 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 shall 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 shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G16. **UPSET**

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

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

A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1) an upset occurred and that the Permittee can identify the cause(s) of the upset;
2) the permitted facility was being properly operated at the time of the upset;
3) the Permittee submitted notice of the upset as required in condition S3.E; and
4) the Permittee complied with any remedial measures required under S4.C of this permit.

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

G17. **PROPERTY RIGHTS**

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

G18. **DUTY TO COMPLY**

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

G19. **TOXIC POLLUTANTS**

The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.
G20. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two (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.

G21. REPORTING ANTICIPATED NONCOMPLIANCE

The Permittee shall give advance notice to the Department by submission of a new application or supplement thereto at least one hundred and eighty (180) days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, shall be scheduled during noncritical water quality periods and carried out in a manner approved by the Department.

G22. REPORTING OTHER INFORMATION

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

G23. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.
APPENDIX F
April 21, 1998

The Honorable Mayor and City Council  
City of Anacortes  
904 Sixth Street  
Anacortes, WA 98221

Attention: Mr. Jim Pemberton, P.E.  
Director of Public Works

Subject: Wastewater Treatment Plant Capacity Evaluation

Dear Mr. Pemberton:

In accordance with our agreement with the City, we have completed the capacity evaluation for the wastewater treatment plant. Actual design capacity was compared to the design capacity indicated in the National Pollution Elimination System (NPDES) Permit. This is documented in this report and the next step for the City would be to request an increase in the permitted loadings to the plant from the Washington Department of Ecology (WDOE). These revised loadings would be submitted to the WDOE as a part of the review and comments on the draft NPDES permit recently obtained from the WDOE.

During the study we have met with you, members of your staff, John Franz, Plant Superintendent and Ian Munce, Director of Planning and we appreciate the assistance and cooperation extended to us.

We remain available to answer any questions regarding our findings.

Sincerely,

HDR ENGINEERING, INC.

Brad Einfeld  
Project Manager

cc: Ian Munce  
John Franz

HDR Engineering, Inc.

Suit 1200  
500 108th Avenue, N.E.  
Bellevue, Washington  
98004-5538

Telephone 425 453-1523  
Fax 425 453-7107
City of Anacortes  
Wastewater Treatment Plant  
Capacity Evaluation  

April 1998

The technical material and data contained in this report were prepared under the supervision and direction of the undersigned, whose seal as a professional engineer licensed to practice is affixed below.

Brad J. Einfeld  
HDR Engineering, Inc.
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Appendix A  Anacortes WWTP NPDES Permit
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CHAPTER 1
SUMMARY OF FINDINGS

INTRODUCTION

The existing City of Anacortes Wastewater Treatment Plant (WWTP) has the following design criteria identified in the National Pollution Discharge Elimination System (NPDES) Permit.

"Average flow for the maximum month 3.2 MGD
Influent BOD₅ loading for the maximum month 5,316 lbs./day
Influent TSS loading for the maximum month 5,674 lbs./day"

The NPDES Permit contains language that indicates that when these design criteria are approached, the Owner must demonstrate to the State of Washington Department of Ecology (WDOE) a plan for addressing this situation.

The Anacortes WWTP is well operated and the effluent discharged is well within discharge permit requirements, but on several occasions the above indicated flow criterion has been approached or exceeded. HDR Engineering, Inc. was retained by the City to review plant performance and review the actual plant capacity to determine if a request should be made to the WDOE for an increase in these criteria.

HISTORICAL LOADINGS

The historical loadings to the plant and effluent quality were reviewed for the years from 1994 through 1996 as a part of this study. The effluent quality was well within the discharge permit requirements. In one month, the average influent flow did exceed the criteria listed in the permit design criteria, but this had no adverse impacts on plant performance.

PLANT CAPACITY EVALUATION

Liquid stream and solids handling processes were evaluated to determine the actual capacity for each component of the process.

Due to the fact that the City of Anacortes does have some combined sewers and combined sewer overflows within the system, peak hour flows have been reached on several occasions, but this is not uncommon for this type of system.

Based on the evaluation of the liquid stream process, it appears that the actual maximum month capacity exceeds the 3.2 mgd design criteria indicated in the NPDES permit.

The biological processes are conservatively sized and the actual design capacity for influent BOD₅ loadings exceed those indicated in the NPDES permit.
The solids handling process are also conservatively sized and the actual capacity for influent total suspended solids loading exceeds the criteria indicated in the NPDES Permit.

**RECOMMENDED DESIGN CRITERIA**

Based on this evaluation, the design capacity for the NPDES Permit for the treatment plant without any modifications could be revised to the following:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Maximum Month Flow</td>
<td>4.5 mgd</td>
</tr>
<tr>
<td>Maximum Month BOD</td>
<td>6,400 lbs/d</td>
</tr>
<tr>
<td>Maximum Month Solids</td>
<td>6,400 lbs/d</td>
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</table>

The City should request a modification from the WDOE for the design criteria contained in the NPDES permit. The City has recently received a draft NPDES Permit from the WDOE for review and should submit this requested design loading modification as a part of the comment process on the draft permit.
CHAPTER 2
INTRODUCTION

The Anacortes Wastewater Treatment Plant (WWTP) serves a population of 13,700 and was designed to serve a population in excess of 16,200. The existing Anacortes WWTP replaced a smaller facility in 1992 and has not undergone any major upgrades since that time.

The National Pollution Discharge Elimination System (NPDES) Permit issued by the Department of Ecology authorizes the City to discharge treated effluent from the treatment plant to the Guemes Channel. A copy of this permit is included as Appendix A.

Paragraph S4.A of this permit indicates the following design criteria for the treatment plant:

- "Average flow for the maximum month" 3.2 MGD
- "Influent BOD\textsubscript{5} loading for the maximum month" 5,316 lbs./day
- "Influent TSS loading for the maximum month" 5,674 lbs./day"

Paragraph S4.B of the NPDES permit goes on to indicate:

- "When the actual flow or wasteload reaches 85 percent of the design capacity (paragraph A above) for three consecutive months or when the projected increases would reach design capacity within five years, whichever occurs first, the Permittee shall submit to the Department, a plan and a schedule for continuing to maintain capacity at the facility sufficient to achieve the effluent limitations and other conditions of this permit…"

Although the treatment plant has performed well within the permit discharge requirements, the maximum month flow permit design criteria has been approached or exceeded on several occasions. In September 1997, HDR Engineering, Inc. was retained by the City of Anacortes to address this issue.

The purpose of this study was to review treatment plant performance, determine treatment plant design capacity based on present design standards and compare this determined plant capacity with the design capacity indicated in the NPDES Permit. This included:

- **Review of historical loadings to the plant including:**
  - Flow
  - Organic loading
  - Solids loading

- **Review of process capacity of plant components including:**
  - Influent Pumping
  - Primary Clarification
  - Secondary Treatment
- Effluent Pumping
- Solids Handling

- Determine limiting process components.
- Determine if available treatment capacity exceeds the rated NPDES design capacity.
- If the determined available treatment capacity exceeds the currently rated design capacity, recommend revised design criteria be included in the renewed NPDES Permit.

**SUMMARY**

Historical operating data was reviewed for the period from January 1, 1994 through December 31, 1996 and this is summarized in Chapter 3. After a preliminary review of the facility and the historical loading data, the liquid process evaluation was completed. This task included evaluation of the headworks, primary treatment, activated sludge, and disinfection processes. Process units were evaluated based on Washington State Department of Ecology Criteria (WDOE) for Sewage Works Design and accepted design standards. Maximum hydraulic, BOD, and total suspended solids capacities of the liquid process were determined based on hydraulic and solids loading rates and aeration capacity. This evaluation is summarized in Chapter 4. Recommendations for revised design criteria for the NPDES Permit are provided in Chapter 5.
CHAPTER 3
HISTORICAL LOADINGS

Historical treatment plant operating data were reviewed for the period from January 1994 through December 1996. Monthly average loadings were calculated for hydraulic and pollutant loadings to the treatment facility. Monthly average and peak month loads are summarized in Table 3-1. To provide an indication of plant performance, this table also includes monthly average effluent concentrations of BOD and TSS for the corresponding months.

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Flow</th>
<th>Influent Loadings</th>
<th>Effluent Quality</th>
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<tr>
<td></td>
<td>Mgal/d</td>
<td>TSS lb/d</td>
<td>BOD lb/d</td>
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<tr>
<td>Jan-94</td>
<td>1.45</td>
<td>1912</td>
<td>2128</td>
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<td>1.71</td>
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<td>2382</td>
<td>2414</td>
</tr>
<tr>
<td>Aug-94</td>
<td>1.42</td>
<td>2263</td>
<td>2712</td>
</tr>
<tr>
<td>Sep-94</td>
<td>1.52</td>
<td>2093</td>
<td>2371</td>
</tr>
<tr>
<td>Oct-94</td>
<td>1.58</td>
<td>2202</td>
<td>2767</td>
</tr>
<tr>
<td>Nov-94</td>
<td>1.96</td>
<td>2224</td>
<td>2795</td>
</tr>
<tr>
<td>Dec-94</td>
<td>2.20</td>
<td>2166</td>
<td>2550</td>
</tr>
<tr>
<td>1994 Max Month</td>
<td>2.20</td>
<td>2382</td>
<td>2795</td>
</tr>
<tr>
<td>Jan-95</td>
<td>1.91</td>
<td>2247</td>
<td>2326</td>
</tr>
<tr>
<td>Feb-95</td>
<td>2.58</td>
<td>2067</td>
<td>2238</td>
</tr>
<tr>
<td>Mar-95</td>
<td>1.74</td>
<td>2134</td>
<td>2177</td>
</tr>
<tr>
<td>Apr-95</td>
<td>1.61</td>
<td>2163</td>
<td>2256</td>
</tr>
<tr>
<td>May-95</td>
<td>1.43</td>
<td>1993</td>
<td>2242</td>
</tr>
<tr>
<td>Jun-95</td>
<td>1.34</td>
<td>2247</td>
<td>2704</td>
</tr>
<tr>
<td>Jul-95</td>
<td>1.34</td>
<td>2449</td>
<td>2481</td>
</tr>
<tr>
<td>Aug-95</td>
<td>1.46</td>
<td>2229</td>
<td>2484</td>
</tr>
<tr>
<td>Sep-95</td>
<td>1.32</td>
<td>2368</td>
<td>2620</td>
</tr>
<tr>
<td>Oct-95</td>
<td>1.53</td>
<td>2387</td>
<td>2463</td>
</tr>
<tr>
<td>Nov-95</td>
<td>3.41</td>
<td>3471</td>
<td>2844</td>
</tr>
<tr>
<td>Dec-95</td>
<td>2.64</td>
<td>2798</td>
<td>2466</td>
</tr>
<tr>
<td>1995 Max Month</td>
<td>3.41</td>
<td>3471</td>
<td>2844</td>
</tr>
</tbody>
</table>


**TABLE 3-1**  
MONTHLY INFLUENT LOADING (continued)

<table>
<thead>
<tr>
<th>Month</th>
<th>Flow Average Mgal/d</th>
<th>Influent Loadings TSS lb/d</th>
<th>BOD lb/d</th>
<th>Effluent Quality TSS mg/L</th>
<th>BOD mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-96</td>
<td>3.06</td>
<td>2477</td>
<td>2042</td>
<td>5.8</td>
<td>8.2</td>
</tr>
<tr>
<td>Feb-96</td>
<td>2.41</td>
<td>2353</td>
<td>2211</td>
<td>4.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Mar-96</td>
<td>1.63</td>
<td>2367</td>
<td>2161</td>
<td>6.0</td>
<td>8.4</td>
</tr>
<tr>
<td>Apr-96</td>
<td>1.81</td>
<td>2326</td>
<td>2325</td>
<td>7.5</td>
<td>8.9</td>
</tr>
<tr>
<td>May-96</td>
<td>1.72</td>
<td>2483</td>
<td>2353</td>
<td>8.9</td>
<td>11.6</td>
</tr>
<tr>
<td>Jun-96</td>
<td>1.38</td>
<td>2591</td>
<td>2279</td>
<td>8.2</td>
<td>12.7</td>
</tr>
<tr>
<td>Jul-96</td>
<td>1.21</td>
<td>2201</td>
<td>2301</td>
<td>8.2</td>
<td>13.6</td>
</tr>
<tr>
<td>Aug-96</td>
<td>1.21</td>
<td>2837</td>
<td>2392</td>
<td>5.0</td>
<td>8.8</td>
</tr>
<tr>
<td>Sep-96</td>
<td>1.28</td>
<td>2756</td>
<td>2583</td>
<td>3.8</td>
<td>6.8</td>
</tr>
<tr>
<td>Oct-96</td>
<td>1.48</td>
<td>3421</td>
<td>2518</td>
<td>6.9</td>
<td>8.8</td>
</tr>
<tr>
<td>Nov-96</td>
<td>2.44</td>
<td>3828</td>
<td>3175</td>
<td>7.7</td>
<td>9.4</td>
</tr>
<tr>
<td>Dec-96</td>
<td>2.80</td>
<td>3318</td>
<td>2919</td>
<td>4.9</td>
<td>7.7</td>
</tr>
<tr>
<td>1996 Max Month</td>
<td>3.06</td>
<td>3828</td>
<td>3175</td>
<td>8.9</td>
<td>13.6</td>
</tr>
</tbody>
</table>

The maximum monthly loadings for this time period were as follow:

- Flow (November 1995): 3.41 mgd
- TSS (November 1996): 3828 lbs per day
- BOD (November 1996): 3175 lbs per day

The existing effluent limits for the WWTP include maximum monthly TSS and BOD concentrations of 30 mg/L and maximum weekly BOD and TSS concentrations of 45 mg/L. The WWTP effluent has consistently met both maximum monthly and weekly limits. For most months, the average TSS concentration has been less than 10 mg/L and the average BOD concentration has been less than 15 mg/L, concentrations well within the effluent limits. The maximum monthly and weekly average BOD and TSS effluent concentrations from January 1994 through December 1996 were as follow:

- Maximum Month TSS (July 1995): 13.6 mg/L
- Maximum Month BOD (July 1995): 25.1 mg/L
- Maximum Week TSS (July 17-22, 1995): 18.5 mg/L
- Maximum Week BOD (July 17-22, 1995): 28.2 mg/L

During the summer, when flows are lower, the WWTP frequently is operated with only one aeration basin and secondary clarifier on-line. Part of the reason for the higher-than-normal effluent BOD and TSS concentrations in July, 1995, was that, on July 17, the second aeration basin was brought back on-line with only one secondary clarifier on-line. Some process upsets were experienced during this transition resulting in sludge bulking as evidenced by high aeration basin sludge volume index (SVI) values. For the seven-day period during this transition, the SVI rose to approximately 350 mL/g. A normal aeration basin SVI is 100-160 mL/g for the
Anacortes WWTP. Except for this brief upset, the Anacortes WWTP has operated well within permitted discharge limits and the effluent BOD and TSS concentrations have typically been extremely low.

On a number of occasions, the peak hour flow to the plant has exceeded the currently rated peak hour flow at 9.6 mgd. These dates include November 7, 1995, November 28, 1995, November 29, 1995, November 27, 1996, December 30, 1996, and December 31, 1996. In 1995, and years prior, the influent flow to the WWTP was measured at greater than 12.4 mgd, the maximum recordable value of the influent flowmeters. Since November 1996, the sluice gates at the bottom of the screw lift pumps have been used to throttle the flow to a maximum of 10.0 mgd.

It is apparent that the present peak hour capacity of the plant has been exceeded on a number of occasions. Currently, the City has a number of combined sewers within the collection system resulting in high peak hour flows to the WWTP. To reduce the frequency of combined sewer overflow events in the system, the City has rerouted flows within the collection system. This has correspondingly increased the hydraulic loading to the plant in the wet weather months. The City has also implemented a plan of sewer line replacement and storm sewer separation.

Additional measures to decrease or treat the peak hour flows at the WWTP are not a part of this report. The purpose of the following chapters is to analyze the average design loadings to the WWTP, compare those with those loadings indicated in the NPDES Permit, and determine actual design capacity of the plant.
CHAPTER 4
PLANT CAPACITY EVALUATION

INTRODUCTION

The two general categories of treatment at the wastewater treatment plant are the “liquid stream processes” and the “solids handling processes”. The liquid stream processes include treatment of the wastewater and separation of solids from the process flows. Treated liquid or effluent is then discharged via an outfall line to surface waters (Guemes Channel). The separated solids are then further treated and comprise the “solids handling processes”. Each of the two major processes were evaluated and are summarized in this chapter.

LIQUID STREAM PROCESS

The existing design capacity and criteria for each unit process were reviewed. WDOE recommended guidelines and accepted design standards for sizing the processes were used and the maximum rated capacity was estimated based on these guidelines.

There are three primary parameters to consider in establishing the capacity of a unit process which make up the liquid stream process including:

Hydraulic Loading - This is based on the ability of a process to handle flows. The limit may relate to either a simple mechanical (hydraulic) capacity to handle flows without creating backup or bypasses, or it can relate to process performance. An example of the latter would be a clarifier, in which performance generally deteriorates as flows increase.

Organic Loading - Some processes are affected by the amount of BOD (organics) loading. An example of this is the activated sludge process (aeration basins and related equipment).

Solids Loading - The amount of solids can be a limit to some processes. In the liquids process, this is most often a consideration for secondary clarifiers, although it can be a factor for the aeration basins and primary clarifiers as well.

The primary focus of this evaluation was to determine maximum monthly hydraulic, organic, and/or solids loading capacities of each unit process. In addition, the peak hour hydraulic capacities of unit processes were evaluated where applicable.
Treatment Process

The Anacortes WWTP liquid stream process consists of screening, grit removal, primary clarification, step aeration activated sludge, secondary clarification and disinfection with sodium hypochlorite. Recent construction at the WWTP included the addition of sodium bisulfite for dechlorination. A schematic diagram of the liquid stream process is included in Figure 4-1

Headworks and Influent Pumps

The headworks contains two screw lift pumps followed by three channels, each of which contains a bar screen and Parshall flume. The two smaller channels each contain mechanically cleaned bar screens while the bar screen in the largest channel is manually cleaned but rarely used. The size and capacity of the headworks equipment is summarized in Table 4-1.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Size</th>
<th>Number</th>
<th>Capacity-Each (mgd)</th>
<th>Firm Capacity (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw Lift Pumps</td>
<td>70 HP</td>
<td>2</td>
<td>9.6</td>
<td>9.6</td>
</tr>
<tr>
<td>Bar Screens - Mechanical</td>
<td>2-feet</td>
<td>2</td>
<td>4.8</td>
<td>9.6 *</td>
</tr>
<tr>
<td></td>
<td>3-feet</td>
<td>1</td>
<td>9.6</td>
<td></td>
</tr>
<tr>
<td>Parshall Flumes</td>
<td>12-inch</td>
<td>2</td>
<td>4.8</td>
<td>9.6 *</td>
</tr>
<tr>
<td></td>
<td>18-inch</td>
<td>1</td>
<td>9.6</td>
<td></td>
</tr>
</tbody>
</table>

* Based on largest unit out of service.

Each of the two influent pumps has a rated capacity of 9.6 mgd. The firm pumping capacity of the influent pumps is the capacity with the largest pump out of service. In this case, the pumps are equally sized, and the firm pumping capacity is 9.6 mgd. This is the maximum peak hour flow that should enter the plant.

The WDOE criteria require that a backup, manually cleaned bar screen be provided. The large, manually cleaned bar screen meets this criterion and, according to the plant operations and maintenance manual, is rated for flows up to 9.6 mgd. The firm hydraulic capacity of the screens is the capacity with the largest unit out of service. According to the WDOE criteria, the maximum through screen velocity for mechanically cleaned bar screens should not exceed 3.0 feet per second. Based on this criterion, the rated capacity of the existing mechanically cleaned screens could be increased slightly to approximately 5.2 mgd for a total firm capacity of 10.4 mgd.
CITY OF ANACORTES
Wastewater Treatment Plant

Figure 4-1
Schematic Diagram
Liquid Stream Process
Primary Clarification

Primary clarification is provided by two rectangular clarifiers with a total surface area of 3,240 square feet. Surface loading rates were developed and compared to WDOE criteria and other design criteria. The overflow rate for primary clarifiers stated in the *WDOE Criteria for Sewage Works Design* is 800 to 1200 gallons per square foot for average daily flow. Although the term "average day flow" is indicated in the WDOE document, for this sizing criteria, "average day flow" is actually defined in the WDOE document as "maximum month for the estimated design of the sewage works".

Although this assumption provides for a conservative design, the indicated clarifier hydraulic loading criteria are typically applied to the actual "average daily flow" and not the "maximum month" flow. The "average daily flow" as defined in *Wastewater Engineering: Treatment, Disposal, and Reuse* (Tchobanoglous and Burton, 1991) is defined as "The average flow rate occurring over a 24 hour period based on total annual flow rate data".1

This reference indicates an average design overflow rate of 800 to 1200 gallons per day per square foot for "average daily flow." The "maximum month flow" is typically significantly greater than the "average annual flow" and is summarized for the Anacortes WWTP as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Annual Flow (mgd)</th>
<th>Maximum Month Flow (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>1.60</td>
<td>2.20</td>
</tr>
<tr>
<td>1995</td>
<td>1.86</td>
<td>3.41</td>
</tr>
<tr>
<td>1996</td>
<td>1.87</td>
<td>3.06</td>
</tr>
<tr>
<td>Average</td>
<td>1.78</td>
<td>2.89</td>
</tr>
</tbody>
</table>

The ratio of maximum month flow to average annual for this three year time period is 1.62. Since the City of Anacortes has some combined sewers, this ratio may be somewhat greater than that experienced in systems that do not have combined sewers. The ratio of maximum month flow to average annual flow will typically range from 1.2 to 1.5.

In the case of hydraulic loading rates for primary clarifiers, if the design loading rates are exceeded, the efficiency of solids removed may be reduced, but the process will still function. In the event of poor performance of primary clarifiers, the downstream secondary treatment process will be subject to greater loadings, but as long as the secondary process is adequately sized, the effluent discharge criteria can still be met. (There are some smaller secondary treatment plants that are designed without primary clarifiers.)

Plant performance was evaluated for the following maximum months flow for the years 1994-1996:

---

1 Page 36.
Maximum Monthly Average Max. Week Effluent TSS Effluent TSS Month Flow (mgd) (mg/L) (mg/L)

<table>
<thead>
<tr>
<th>Year, Month</th>
<th>(mgd)</th>
<th>(mg/L)</th>
<th>(mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994, December</td>
<td>2.20</td>
<td>9.8</td>
<td>12.6</td>
</tr>
<tr>
<td>1995, November</td>
<td>3.41</td>
<td>7.3</td>
<td>12.2</td>
</tr>
<tr>
<td>1996, January</td>
<td>3.06</td>
<td>5.8</td>
<td>6.9</td>
</tr>
</tbody>
</table>

In these cases, during the maximum flow months, the effluent criteria for TSS and BOD₅ was well within the 30 mg/L monthly average maximum and 45 mg/L weekly average NPDES permit limits.

A revised recommended “maximum month” design loading of 1,500 gpd/sf for the primary clarifiers was developed based on an “annual average” loading rate of 1,000 gpd/sf and maximum month to annual sewage ratio of 1.5. This ratio of 1.5 is reasonably conservative given the 1.62 ratio previously calculated for Anacortes WWTP.

This comparison is summarized in Table 4-2.

<table>
<thead>
<tr>
<th>TABLE 4-2 PRIMARY CLARIFIER LOADING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criteria</strong></td>
</tr>
<tr>
<td>WDOE Design Criteria (gpd/sf)</td>
</tr>
<tr>
<td>Existing Design Criteria (gpd/sf)</td>
</tr>
<tr>
<td>Recommended Design Criteria (gpd/sf)</td>
</tr>
<tr>
<td>Original Design Capacity (mgd)</td>
</tr>
<tr>
<td>Maximum Month Calculated Design Capacity (mgd)</td>
</tr>
<tr>
<td>Maximum Loading to Date (mgd)</td>
</tr>
</tbody>
</table>

Notes:
(1) Includes 0.4 mgd for gravity thickener overflow, grit classifier overflow, ash thickener overflow, tray scrubber recycle, and belt filter press filtrate.
(2) Calculated based on maximum influent flow and 0.4 mgd for miscellaneous flows.

The “maximum month” design capacity of 4.9 mgd includes 0.4 mgd of internal process flows, so that the actual rated “maximum month” influent flow would be adjusted by this amount. The maximum month design capacity would then be 4.5 mgd.

This revised design capacity is a significant increase over the present design criteria of 3.2 mgd listed in the permit and is more representative of the actual capacity of the facility.
Activated Sludge Process

The primary purpose of the activated sludge process is to convert the organics present in the wastewater into biomass which can be settled and removed from the wastewater. Thus, both hydraulic and organic loading criteria are used to size the process components. For the Anacortes WWTP, the activated sludge process was originally designed for a maximum monthly flow of 3.5 mgd (3.2 mgd influent, plus 0.4 mgd miscellaneous plant flows, and minus 0.1 mgd for primary solids removal). The components of the activated sludge process include two aeration basins, two secondary clarifiers, and ancillary equipment.

The hydraulic sizing criteria for aeration basins require that the basins are sized to provide adequate hydraulic detention time to sustain the activated sludge process. For step aeration plug flow processes, the recommended hydraulic retention time is from 3 to 5 hours. The total volume of the two basins is 680,000 gallons. At the design maximum month flow of 3.5 mgd, the hydraulic retention time is 4.7 hours, significantly greater than the minimum recommended 3 hours. Alternatively, at a hydraulic detention time of 3 hours, the highest recommended maximum monthly flow is 5.44 mgd.

The parameters that must be reviewed when analyzing the organic loading to the aeration basins are organic loading per unit volume and aeration capacity. The maximum recommended BOD loading for a step aeration basin is 60 lbs BOD/1,000 cubic feet. Given this criterion, the maximum recommended BOD load to the aeration basins is 5,543 lbs/day. For the period evaluated, the maximum aeration basin monthly BOD load was 1,912 pounds per day, well below the maximum recommended loading.

There also must be sufficient air to provide adequate oxygen for the process to function properly. The treatment facility is equipped with three blowers, each with a capacity of 2,600 cfm. As with the influent pumps, the firm capacity of the blowers is equal to the capacity provided with the largest unit out of service; in this case, 5,200 cfm. WDOE guidelines require a minimum of 1,500 cubic feet of air per pound BOD applied to the aeration basins. Based on this WDOE criterion, the maximum recommended BOD loading to the aeration basins is 4,990 lbs/day (Table 4-3).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Maximum Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDOE Design Criteria (cf/lb BOD)</td>
<td>1,500</td>
</tr>
<tr>
<td>Original Design Capacity (lb BOD/day)</td>
<td>4,100</td>
</tr>
<tr>
<td>Maximum Calculated Design Capacity (lb BOD/day)</td>
<td>4,990</td>
</tr>
<tr>
<td>Maximum Loading to Date (lb BOD/day)</td>
<td>1,912</td>
</tr>
</tbody>
</table>
The activated sludge process is designed for a maximum influent flow of 7.8 mgd. To protect the process, flows greater than this are designed to crest a weir (elevation 111.60 feet) located at the effluent end of the primary clarifiers and bypass the aeration basins and secondary clarifiers via a 12-inch pipe. This pipe is connected to the secondary splitter box just upstream of the chlorine contact basins.

There are two 65-foot diameter secondary clarifiers which provide a total surface area of 6,637 square feet. The hydraulic and solids loading rates were compared to WDOE design criteria and this comparison is provided in Table 4-4. Based on this analysis, the maximum monthly hydraulic loading to the secondary clarifier could be increased to 5.3 mgd and still meet the recommended WDOE criterion.

<table>
<thead>
<tr>
<th>Table 4-4</th>
<th>SECONDARY CLARIFIER EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criteria</strong></td>
<td><strong>Maximum Month</strong></td>
</tr>
<tr>
<td>WDOE Design Criteria</td>
<td></td>
</tr>
<tr>
<td>Surface Overflow Rate (gpd/st)</td>
<td>600-800</td>
</tr>
<tr>
<td>Solids Loading Rate (lbs/d/st)</td>
<td>25</td>
</tr>
<tr>
<td>Original Design Capacity</td>
<td></td>
</tr>
<tr>
<td>Flow (mgd)</td>
<td>3.5</td>
</tr>
<tr>
<td>Solids (lbs/day)</td>
<td>120,400</td>
</tr>
<tr>
<td>Maximum Calculated Design Capacity</td>
<td></td>
</tr>
<tr>
<td>Flow (mgd)</td>
<td>5.3</td>
</tr>
<tr>
<td>Solids (lbs/day)</td>
<td>165,900</td>
</tr>
<tr>
<td>Maximum Historical Loading to Date</td>
<td></td>
</tr>
<tr>
<td>Flow (mgd)</td>
<td>3.4</td>
</tr>
<tr>
<td>Solids (lbs/day)</td>
<td>79,500</td>
</tr>
</tbody>
</table>

Notes:
1. Based on influent wastewater flow. Does not include activated sludge return flow.
2. 50 percent recycle.

WDOE reliability criteria state that the capacity of the secondary clarifiers should be at least 50 percent of the total design flow with the largest-flow-capacity unit out of service. With two equally sized clarifiers, the Anacortes WWTP meets this criterion for the rated design flow.

**Disinfection System**

When originally constructed, the disinfection system consisted of gaseous chlorination followed by two contact tanks, one around each secondary clarifier, with a combined volume of 156,300 gallons. In 1997, the gaseous chlorine system was replaced with a sodium hypochlorite feed system and sodium bisulfite was added for dechlorination. WDOE criteria for the chlorine contact tanks are to provide at least one hour detention time at maximum month average day flows and 20 minutes at peak hour flows. Plant design criteria are compared to the WDOE guidelines in Table 4-5.
### TABLE 4-5
CHLORINE CONTACT TANK EVALUATION

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Maximum Month Flow (mgd)</th>
<th>Peak Hour Flow (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDOE Design Criteria (min)</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>Existing Design Criteria (min)</td>
<td>66</td>
<td>22.5</td>
</tr>
<tr>
<td>Original Design Capacity (mgd)</td>
<td>3.75</td>
<td>10.0</td>
</tr>
<tr>
<td>Maximum Recommended Design Capacity (mgd)</td>
<td>4.5</td>
<td>11.3</td>
</tr>
<tr>
<td>Detention Time at Maximum Recommended Capacity (min.)</td>
<td>51</td>
<td>20</td>
</tr>
</tbody>
</table>

The basis for the recommended WDOE design criteria is fairly conservative. Similar to the hydraulic loading recommendations for the primary clarifiers, the WDOE standards for chlorine contact tanks are based on the “maximum month flow” rather than an “annual average” flow. As stated previously, the ratio of the “maximum month” to “average annual” flow for the Anacortes WWTP is 1.62 for the period 1994-1996. Typically, this ratio can range from 1.2 to 1.5 for systems without combined sewers.

If the “annual average” flow rather than the “maximum month” flow is used as the criterion for sizing the chlorine contact tanks, the design capacity could be increased accordingly. Based on the more conservative ratio of 1.2, the design capacity of the contact basins could still be increased from 3.75 to 4.5 mgd if an “annual average” flow is used as the basis for design.

A review of other design criteria, commonly referred to as the Ten State Standards, indicate that a minimum peak hour detention time of 15 minutes is required for chlorine contact tanks. This reference does not stipulate a minimum detention time for “average annual” or “maximum month” flows. The lower detention time allowed under the Ten State Standards is another indication of the conservative basis for WDOE criteria for chlorine contact tanks.

Recently, dechlorination facilities were added to the Anacortes WWTP. These facilities should allow the chlorine dosage to be increased during periods of high flow or effluent suspended solids and still achieve effective fecal coliform reduction while minimizing the chlorine residual. Given this flexibility in operation and allowance for a higher chlorine feed rate, the disinfection system should be able to meet the fecal coliform limits stated in the NPDES permit under higher design flows.

### SOLIDS HANDLING PROCESS

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2 Reference: Great Lakes-Upper Mississippi Board of State Public Health and Environmental Managers, Recommended Standards for Wastewater Facilities.
The solids handling processes at the Anacortes WWTP include gravity thickening of combined primary and waste activated solids, dewatering with a belt filter press, and incineration of the dewatered solids. Analyses of the existing thickening and dewatering systems included a review of operating data and comparison of the existing operating parameters with recommended design criteria. A schematic diagram of the solids handling process is shown on Figure 4-2.

Primary sludge is pumped from the primary clarifiers through cyclones which remove most of the grit greater than 150 microns in diameter and with a specific gravity of 2.65. Generally, the primary solids are kept below 0.5 percent solids because concentrations greater than this will reduce the effectiveness of the grit cyclones and increase the potential for clogging of the cyclones. From the cyclones, the primary sludge flows to the gravity thickeners where it is combined with waste activated sludge from the secondary clarifiers.

Waste activated sludge (WAS) is pumped from the secondary clarifiers and also thickened in the gravity thickeners. The overflow from the gravity thickeners is routed back to the primary clarifier influent channel while the thickened solids are pumped to the belt filter press to be dewatered. The dewatered solids are then fed to the incinerator where they are burned resulting in ash which is disposed of in a landfill. The solids handling equipment is summarized in Table 4-6.

**Primary Solids**

The sludge from the primary clarifiers is pumped through the grit cyclones and from these units flows by gravity into the gravity thickeners. For the grit cyclones to function effectively, the concentration of the primary solids should not exceed 0.5 percent. Assuming a solids concentration of 0.25 percent and 60 percent TSS removal in the primary clarifiers, the maximum monthly primary sludge flow would be approximately 113 gpm at the rated maximum month solids loading of 5674 lbs/d. Given this load, the primary sludge pumps and hydrocyclones, which each have a capacity of 200 gpm, appear to be conservatively sized.
CITY OF ANACORTES
Wastewater Treatment Plant

Figure 4-2
Schematic Diagram
Solids Handling Process
Secondary Solids

Similarly, the WAS pumps are adequately sized for the maximum month design loads. The peak-day WAS flowrate for the period evaluated was 53,996 gpd or 37 gpm. A doubling of the WAS wasting rate would still be well within the 100 gpm capacity of one of the two WAS pumps.

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<thead>
<tr>
<th>TABLE 4-6</th>
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<tbody>
<tr>
<td>SOLIDS HANDLING EQUIPMENT</td>
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<table>
<thead>
<tr>
<th>PRIMARY SOLIDS</th>
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<tbody>
<tr>
<td>Primary Sludge Pumps</td>
</tr>
<tr>
<td>Quantity</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Capacity (Each)</td>
</tr>
<tr>
<td>Grit Cyclones</td>
</tr>
<tr>
<td>Quantity</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Capacity (Each)</td>
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</table>

<table>
<thead>
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<th>SECONDARY SOLIDS</th>
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<tr>
<td>Waste Activated Sludge Pumps</td>
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<tr>
<td>Quantity</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Capacity (Each)</td>
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<table>
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<th>SOLIDS THICKENING AND DEWATERING</th>
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<tr>
<td>Gravity Thickeners</td>
</tr>
<tr>
<td>Quantity</td>
</tr>
<tr>
<td>Diameter</td>
</tr>
<tr>
<td>Sidewall Depth</td>
</tr>
<tr>
<td>Thickened Sludge Pumps</td>
</tr>
<tr>
<td>Quantity</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Capacity (Each)</td>
</tr>
<tr>
<td>Belt Filter Press</td>
</tr>
<tr>
<td>Quantity</td>
</tr>
<tr>
<td>Nominal Size</td>
</tr>
<tr>
<td>Maximum Solids Loading</td>
</tr>
<tr>
<td>Maximum Hydraulic Loading</td>
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<table>
<thead>
<tr>
<th>INCINERATION</th>
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<tr>
<td>Type of Incinerator</td>
</tr>
<tr>
<td>Capacity</td>
</tr>
<tr>
<td>Incinerator Feed Pump</td>
</tr>
</tbody>
</table>
Solids Thickening

Primary and secondary solids are combined and thickened in two gravity thickeners. Given the current low solids loading, typically only one thickener is used. The second one is typically used for sludge storage and thickening when the incinerator is taken off-line. Existing, recommended, and design hydraulic and solids loadings for the gravity thickeners are summarized in Table 4-7. From this data, it appears that the existing solids loadings to the thickeners is well below the design solids load and the thickeners are conservatively sized.

![Table 4-7: Gravity Thicker Loadings](image)

Solids Dewatering

From the gravity thickeners, sludge is conveyed to the belt filter press with three progressive cavity pumps. Both the belt filter press and thickened sludge pumps are sized to allow intermittent operation of this equipment and the incinerator. To date, the peak day solids and hydraulic loading to the belt filter press occurred shortly after the incinerator was restarted following a 10-day shutdown. Normally the incinerator and associated equipment is operated for only 5 days per week for only 8 hours per day.

Incineration

The dewatered sludge is fed to a fluidized bed incinerator via a piston pump. The capacity of the pump is 2,600 wet lbs per hour. The incinerator is rated for a dry solids loading of 600 lbs per hour. Under normal operating conditions, the incinerator is operated for 8 hours per day, for 5 days per week. If the incinerator were operated continuously, this would be 7 days per week at 24 hours per day for a total of 168 hours per week. To estimate the percent of total capacity being utilized, the allowable operating time was reduced to 20 hours per day, for 7 days per week for a total of 140 hours per week. At present loads, this operating scenario utilizes approximately 29 percent of the maximum available incinerator capacity.
SUMMARY OF CAPACITY EVALUATION

Liquid Stream Process

On a maximum month basis, the recommended design capacity can be increased in most cases. In addition, the historical maximum month loadings are well within the maximum loadings to date. The Anacortes WWTP is still hydraulically limited during peak flows, and the City’s efforts in reducing combined sewer overflows should be continued.

<table>
<thead>
<tr>
<th>TABLE 4-8</th>
<th>ANACORTES WWTP LIQUID STREAM CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Influent Pumps</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Peak Hour Flow (mgd) | Original Design Capacity | Maximum Recommended Design Capacity | Maximum Loading to Date | Possible Capacity Limitation
| | 9.6 | 9.6 | 12.4 | Yes |
| **Barscreens** | | | | |
| Peak Hour Flow (mgd) | 9.6 | 10.4 | 12.4 | Yes |
| **Primary Clarifiers** | | | | |
| Maximum Month Flow (mgd) | 3.6 | 4.9<sup>(2)</sup> | 3.8 | No |
| Peak Hour Flow (mgd) | 10.5 | 9.7 | 12.8 | No |
| **Aeration Basins** | | | | |
| Maximum Month Flow (mgd) | 3.5 | 5.4 | 3.4 | No |
| BOD Load - Max. Month (lbs/d) | 4,100 | 5,450 | 1,912 | No |
| BOD Aeration – Max. Month (lbs/d) | 4,100 | 4,990 | 1,912 | No |
| **Secondary Clarifiers** | | | | |
| Maximum Month Flow (mgd) | 3.5 | 5.3 | 3.7 | No |
| Peak Hour Flow (mgd) | 7.8 | 8.0 | 7.8 | No |
| **Chlorine Contact Basins** | | | | |
| Maximum Month Flow (mgd) | 3.4 | 4.5 | 3.6 | No |
| Peak Hour Flow (mgd) | 10.0 | 11.3 | 12.4 | Yes |
| **Effluent Pumps and Outfall** | | | | |
| Peak Hour Flow (mgd) | 9.8 | 9.8<sup>(3)</sup> | 12.4 | Yes |

<sup>(1)</sup> Current flows and loads.
<sup>(2)</sup> Includes 0.4 mgd plant return flow loading the primary clarifiers at a greater loading rate may decrease the efficiencies but will not limit the total plant capacity.
<sup>(3)</sup> Maximum calculated capacity based on highest capacity affected by tidal elevation.
Solids Handling

The capacity of the solids handling processes exceed those required for present and anticipated conditions. The estimated utilization of the existing capacity of the solids handling process components are summarized in Table 4-9. This shows that the primary sludge pumps and gravity thickener at an estimated 57 percent and 43 percent of maximum capacity could ultimately be the limiting components. These would eventually be followed by the waste activated sludge pumps, thickened sludge pumps, incinerator, and belt filter press at 37 percent, 32 percent, 29 percent, and 25 percent of rated capacity respectfully.

<table>
<thead>
<tr>
<th>Process Component</th>
<th>Percent of Maximum Calculated Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Sludge Pumps</td>
<td>57</td>
</tr>
<tr>
<td>Waste Activated Sludge Pumps</td>
<td>37</td>
</tr>
<tr>
<td>Gravity Thickener</td>
<td>43</td>
</tr>
<tr>
<td>Thickened Sludge Pumps</td>
<td>32(1,2)</td>
</tr>
<tr>
<td>Belt Filter Press</td>
<td>25(1)</td>
</tr>
<tr>
<td>Incinerator Feed Pump</td>
<td>29(1)</td>
</tr>
<tr>
<td>Incinerator</td>
<td>29(1)</td>
</tr>
</tbody>
</table>

(1) Assumes 20 hours a day operations, seven days per week.
(2) 2 percent solids concentration.
CHAPTER 5
RECOMMENDED DESIGN CRITERIA

INTRODUCTION

The Anacortes WWTP is conservatively designed. The review of effluent quality in Chapter 3 indicated that the effluent BOD and TSS were well below permitted concentrations. From the analysis in the previous chapter, it was determined that the “maximum month” hydraulic capacity of individual unit processes ranged from approximately 4.5 to 5.4 mgd. In addition, the solids handling capacity of the WWTP is significantly greater than the presently rated “maximum month” solids loading.

PRESENT NPDES PERMIT DESIGN CRITERIA

The presently rated maximum month loadings for the WWTP are as follow:

- Maximum Month Flow: 3.2 mgd
- Maximum Month BOD: 5,316 lbs/d
- Maximum Month Solids: 5,674 lbs/d

Hydraulic Capacity
Based on the analysis from the previous chapter, the maximum month hydraulic capacities of various unit processes are summarized in Table 5-1.

The plant has performed well and the indicated design criteria for the “maximum month” flow may be low based on a review of all processes in the liquid stream. It appears the limiting processes based on WDOE criteria are the primary clarifiers and the size of the chlorine contact basin. Based on a review of operating data and other design criteria, it appears that the primary clarifiers could be rated for a maximum month loading of 4.5 mgd (without recycle flow) and that the disinfection system could similarly be increased to the same 4.5 mgd. The recommended “maximum month” hydraulic loading criteria is summarized below.

<table>
<thead>
<tr>
<th>Unit Process</th>
<th>Max. Month Flow (mgd)</th>
<th>Max. Month Flow (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Clarifiers</td>
<td>4.9(^{(1)})</td>
<td>4.5</td>
</tr>
<tr>
<td>Aeration Basins</td>
<td>5.4(^{(2)})</td>
<td>5.1</td>
</tr>
<tr>
<td>Secondary Clarifiers</td>
<td>5.3(^{(2)})</td>
<td>5.0</td>
</tr>
<tr>
<td>Chlorine Contact Basins</td>
<td>4.5</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Notes:
\(^{(1)}\) Includes 0.4 mgd of sidestream flows.
\(^{(2)}\) Includes 0.4 mgd of sidestream flows minus 0.1 mgd for primary solids removed.
BOD Capacity
The BOD₅ and TSS loadings in the NPDES permit are conservative. To date, the greatest single monthly loading for BOD₅ has reached 60 percent of the design criteria and the TSS has reached 67 percent of the design criteria for a single month. The BOD capacity is limited by the BOD loading and aeration capacity of the secondary treatment process. From the analysis in the previous chapter, the blower capacity is the more restrictive of these two criteria for the plant at 4,990 lbs/day. Primary clarification will typically remove from 30 to 35 percent of the influent BOD. Taking the average of this and a 1.5 safety factor allows for 22 percent removal. Using this conservative 22 percent BOD removal in the primary clarifiers, the maximum recommended influent BOD load is 6,400 lbs/day.

Solids Capacity
Several pieces of solids handling equipment, including the gravity thickeners and the incinerator are sized to accommodate more than a doubling in the solids loading to WWTP. Based on the proposed maximum month BOD loading and the present ratio of influent solids to influent BOD, the proposed maximum month TSS is 6,400 lbs per day. This is well within the projected solids handling capacity of each of the unit processes.

RECOMMENDED REVISED NPDES PERMIT DESIGN CRITERIA

Based on a review of the limiting process components, it is recommended that the maximum monthly permitted loadings should be able to be increased to the following without any revisions to the WWTP:

<table>
<thead>
<tr>
<th>Maximum Month Flow</th>
<th>4.5 mgd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Month BOD</td>
<td>6,400 lbs/d</td>
</tr>
<tr>
<td>Maximum Month Solids</td>
<td>6,400 lbs/d</td>
</tr>
</tbody>
</table>

The City should apply to the WDOE for an increase in the stated design capacity in the NPDES Permit. The City has received a draft copy of the new NPDES permit from the WDOE. A copy of this draft permit is included as Appendix B. As a part of the formal response to the draft permit, the City should request that the maximum monthly loadings be increased to the recommended criteria presented in this report.
APPENDIX A

ANACORTES WWTP
NPDES PERMIT

October 1, 1993 – April 30, 1998
September 17, 1993

CERTIFIED MAIL
P088 099 398

The Honorable Doyle E. Geer
Mayor, City of Anacortes
PO Box 547
Anacortes, WA 98221

Dear Mayor Geer:

RE: NPDES Permit Issuance
Permit No. WA-002025-7
Expiration Date: April 30, 1998

Under the provisions of Chapter 90.48 RCW Water Pollution Control Laws as amended and the Federal Water Pollution Control Act (The Clean Water Act) Title 33 United States Code, Section 1251 et seq., the enclosed NPDES Permit No. WA-002025-7 is hereby issued to the city of Anacortes located at 500 T Avenue in Anacortes, Skagit County, Washington.

The permit authorizes the Permittee to discharge treated municipal wastewater to Guemes Channel subject to the terms and conditions of the permit.

Pursuant to RCW 90.48.465, a permit fee will be assessed. Semi-annual notices for payment will be mailed to you from our office in Olympia.

Any person feeling aggrieved by this NPDES permit may obtain review thereof by application, within 30 days of receipt of this permit, to the Washington Pollution Control Hearings Board, Post Office Box 40903, Olympia, WA 98504-0903. Concurrently, a copy of the application must be sent to the Department of Ecology, Post Office Box 47600, Olympia, WA 98504-7600. These procedures are consistent with the provisions of Chapter 43.21B RCW and the rules and regulations adopted thereunder.
Any appeal must contain the following in accordance with the rules of the hearings board:

a) The appellant’s name and address;

b) The date and number of the permit appealed;

c) A description of the substance of the permit, that is the subject of the appeal;

d) A clear, separate, and concise statement of every error alleged to have been committed;

e) A clear and concise statement of facts which the requester relies to sustain his or her statements of error; and

f) A statement setting forth the relief sought.

An application for permit renewal must be made at least 180 days prior to the expiration date of this permit. If at any time during the term of this permit a question should arise regarding the permit or discharge, or if there is a significant change in the discharge or operation, please contact Mr. David Wright at (206) 649-7059.

Sincerely,

John H. Glynn
Water Quality Supervisor
Northwest Regional Office

JHG:CJS:cs
Enclosures

Cc: Permit Fee Unit
EPA-WOO, Olympia
David Wright, Permit Manager
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504-8711

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

CITY OF ANACORTES
P.O. Box 547
Anacortes, Washington 98221

Plant Location:
500 T Avenue
Anacortes, WA 98221

Receiving Water:
Guemes Channel

Waterway Segment Number:
02-03-04

Discharge Location:
Latitude: 48° 31' 23"
Longitude: 122° 36' 31"

Water Body I.D. No.:
WA-03-0020

Plant Type:
Activated Sludge

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

John H. Glynn
Water Quality Supervisor
Northwest Regional Office
Department of Ecology
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<td>Effluent Mixing Study</td>
<td>one time submittal</td>
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<td>S10.C.1</td>
<td>Acute Biomonitoring Characterization</td>
<td>quarterly for 1 year</td>
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<td>S11.C.1</td>
<td>Chronic Biomonitoring Characterization</td>
<td>quarterly for 1 year</td>
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<td>S12.C.</td>
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<td>G17.</td>
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SPECIAL CONDITIONS

51. EFFLUENT LIMITATIONS

A. Effluent Limits

Beginning on the effective date of this permit and lasting through the expiration date the Permittee is authorized to discharge via outfall 001 subject to meeting the following limitations:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Monthly Average</th>
<th>Weekly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemical Oxygen Demand&lt;sub&gt;b&lt;/sub&gt; (5 day)</td>
<td>30 mg/l, 801 lbs/day</td>
<td>45 mg/l, 1201 lbs/day</td>
</tr>
<tr>
<td>Total Suspended Solids&lt;sub&gt;b&lt;/sub&gt;</td>
<td>30 mg/l, 801 lbs/day</td>
<td>45 mg/l, 1201 lbs/day</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>200/100 ml</td>
<td>400/100 ml</td>
</tr>
<tr>
<td>pH</td>
<td></td>
<td>shall not be outside the range 6.0 to 9.0</td>
</tr>
</tbody>
</table>

<sup>a</sup>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.

<sup>b</sup>The monthly average effluent concentration for BOD<sub>5</sub> and Total Suspended Solids shall not exceed 30 mg/l or 15 percent of the respective monthly average influent concentrations, whichever is more stringent.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Monthly Average</th>
<th>Daily Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Residual Chlorine</td>
<td>0.5 mg/L</td>
<td>1.0 mg/L</td>
</tr>
</tbody>
</table>

B. Mixing Zone Descriptions

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

1. The horizontal dimension and boundaries of the mixing zone are as depicted in the following diagram:
S1. EFFLUENT LIMITATIONS: (continued)

The mixing zone extends vertically from the outfall diffuser to an upper boundary at the water surface. The most restrictive upper boundary occurs at Mean Low Low Water (MLLW).

2. The allowable zone of acute criteria exceedance dimensions and boundaries are depicted in the above diagram by the shaded area. The zone of acute criteria exceedance shall not extend more than 23.1 feet in any spatial direction from any individual port.

S2. TESTING SCHEDULE

The Permittee shall monitor the wastewater and sludge according to the following schedule:

COMPLIANCE:

<table>
<thead>
<tr>
<th>TESTS</th>
<th>SAMPLE POINT</th>
<th>SAMPLING FREQUENCY</th>
<th>SAMPLE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>Influent</td>
<td>7/week</td>
<td>Continuous</td>
</tr>
<tr>
<td>BOD₅</td>
<td>Influent</td>
<td>3/week</td>
<td>24-hr. composite</td>
</tr>
<tr>
<td></td>
<td>Chlorinated Effluent</td>
<td>3/week</td>
<td>24-hr. composite</td>
</tr>
<tr>
<td>TSS</td>
<td>Influent</td>
<td>3/week</td>
<td>24-hr. composite</td>
</tr>
<tr>
<td></td>
<td>Chlorinated Effluent</td>
<td>3/week</td>
<td>24-hr. composite</td>
</tr>
<tr>
<td>Fecal</td>
<td>Chlorinated Effluent</td>
<td>3/week</td>
<td>grab</td>
</tr>
<tr>
<td>Coliform*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Chlorinated Effluent</td>
<td>7/week</td>
<td>grab</td>
</tr>
<tr>
<td>Available (Residual) Chlorine*</td>
<td>Chlorinated Effluent</td>
<td>7/week</td>
<td>grab</td>
</tr>
<tr>
<td>pH</td>
<td>Chlorinated Effluent</td>
<td>7/week</td>
<td>grab</td>
</tr>
</tbody>
</table>

* Total available (residual) chlorine shall be sampled at the same time fecal coliform samples are taken.

WHOLE EFFLUENT TOXICITY:

<table>
<thead>
<tr>
<th>Tests</th>
<th>Sample Point</th>
<th>Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Biomonitoring</td>
<td>Final Effluent</td>
<td>4/year</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Biomonitoring Characterization (S9.A.)</td>
<td>(One year only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic Biomonitoring</td>
<td>Final Effluent</td>
<td>4/year</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Biomonitoring Characterization (S10.A.)</td>
<td>(One year only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### S2. TESTING SCHEDULE: (continued)

#### SLUDGE:

<table>
<thead>
<tr>
<th>Tests</th>
<th>Sample Point</th>
<th>Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metals (total):</td>
<td>Sludge fed to incinerator</td>
<td>4/year</td>
<td>manual composite</td>
</tr>
<tr>
<td>Arsenic/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beryllium/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadmium/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chromium/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mercury/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel/</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### PRIORITY POLLUTANT ANALYSIS:

<table>
<thead>
<tr>
<th>Tests</th>
<th>Sample Point</th>
<th>Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority Pollutant Metals (Total Recoverable)</td>
<td>Final Effluent</td>
<td>1/qtr</td>
<td>24-hour composite</td>
</tr>
<tr>
<td>Antimonialy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beryllium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
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<td></td>
</tr>
<tr>
<td>Chromium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead</td>
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<td></td>
<td></td>
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<tr>
<td>Mercury</td>
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<tr>
<td>Nickel</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Selenium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thallium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Orgamics                       | Final Effluent             | 1/year             | 24-hour composite |
| Acid Extractables              |                            | rotated through    | calendar quarters |
| Base-Neutral                   |                            | calendar quarters  |                  |
| Polychlorinated biphenyls      |                            |                    |                  |

| Volatile Organic               | Final Effluent             | 1/year             | grab              |
|                                |                            | rotated through    | calendar quarters |
|                                |                            |                    |                  |

### S3. MONITORING AND REPORTING

The Permittee shall monitor the operations and efficiency of all treatment and control facilities and the quantity and quality of the waste discharged. A record of all such data shall be maintained. The Permittee shall monitor the parameters as specified in Condition S2. of this permit.
MONITORING AND REPORTING: (continued)

A. Reporting

Monitoring results obtained during the previous month shall be summarized and reported on a form provided, or otherwise approved, by Ecology, to be submitted no later than the 15th day of the month following the completed reporting period. The report shall be sent to the Department of Ecology, Northwest Regional Office, 3190 160th Avenue S.E., Bellevue, Washington 98008. Monitoring shall be started on the effective date of the permit and the first report is due on the 15th day of the following month.

In addition to the monthly report, a summary report form (EPA No. 3320-1) shall be submitted no later than the 15th day of the following month. This report is limited to the parameters specified in condition S1A.

B. Records Retention

The Permittee shall retain for a minimum of three (3) years all records of monitoring activities and results, including all reports of recordings from continuous monitoring instrumentation. The Permittee shall retain for a minimum of five (5) years all records pertaining to the monitoring of sludge. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by the Director.

C. Recording of Results

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

D. Representative Sampling

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

E. Test Procedures

All sampling and analytical methods used to meet the monitoring requirements specified in this permit shall, unless approved otherwise in writing by the Department, conform to the Guidelines Establishing Test Procedures for the Analysis of Pollutants, contained in 40 CFR Par 136.
F. Flow Measurement

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

G. Laboratory Accreditation

All monitoring data, except for flow, temperature, and internal process control parameters, shall be prepared by a laboratory registered or accredited under the provisions of, Accreditation of Environmental Laboratories, Chapter 173-50 WAC. Soils and hazardous waste data are exempted from this requirement pending certification of laboratories for analysis of these media by the Department.

H. Additional Monitoring by the Permittee

If the Permittee monitors any pollutant more frequently than required by this permit (§2.) the monitoring should be done using acceptable test procedures and the results of this monitoring shall be included in the Permittee's self-monitoring reports.

I. Signatory Requirements

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

1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by this permit and other information requested by the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Department, and

   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 I.2.b 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 I.2.b must be submitted to the Department 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 shall make the following certification: "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for willful violations."

J. Reporting - Shellfish Protection

Unauthorized discharges such as collection system overflows, plant bypasses, or failure of the disinfection system, shall be reported immediately to the Department of Ecology and the Department of Health, Shellfish Program. The Ecology 24-hour number is 206-649-7000, and the Department of Health Shellfish 24-hour number is 206-753-5992.

S4. PREVENTION OF FACILITY OVERLOADING

A. Design Criteria

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

- Average flow for the maximum month: 3.2 MGD
- Influent BOD₅ loading for maximum month: 5316 lb/day
- Influent TSS loading for maximum month: 5674 lb/day

B. Plans for Maintaining Adequate Capacity

When the actual flow or wasteload reaches 85 percent of the design capacity (paragraph A above) for three consecutive months, or when the projected increases would reach design capacity within five years, whichever occurs first, the Permittee shall submit to the Department, a plan and a schedule for continuing to maintain capacity at the facility sufficient to achieve the effluent limitations and other conditions of this permit. This plan shall address any of the following actions or any others necessary to meet this objective.
S4. PREVENTION OF FACILITY OVERLOADING: (continued)

1. Analysis of the present design including the introduction of any process modifications that would establish the ability of the existing facility to achieve the effluent limits and other requirements of this permit at specific levels in excess of the existing design criteria specified in paragraph A above.

2. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system.

3. Limitation on future sewer extensions or connections or additional wasteloads.

4. Modification or expansion of facilities necessary to accommodate increased flow or wasteload.

5. Reduction of industrial or commercial flows or waste loads to allow for increasing sanitary flow or wasteload.

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

C. Notification of New or Altered Sources

The Permittee shall submit written notice to the Department whenever any new discharge or increase in volume or change in character of an existing discharge into the sewer is proposed which: (1) would interfere with the operation of, or exceed the design capacity of, any portion of the collection or treatment system; (2) would increase the total system flow or influent waste loading by more than 10 percent; (3) is not part of an approved general sewer plan or approved plans and specifications; or would be subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act. This notice shall include an evaluation of the system's ability to adequately transport and treat the added flow and/or wasteload.

S5. OPERATION AND MAINTENANCE OF MUNICIPAL FACILITIES

A. Certified Operator

In accordance with Chapter 173-230 WAC, the Permittee shall provide an adequate operating staff which is qualified to carry out the operation, maintenance, and testing activities required to ensure compliance with the conditions of this permit. An operator certified for a Class III plant by the State of Washington shall be in responsible charge of the day-to-day operation of the wastewater treatment plant. A Class II operator shall be present at the facility during all shifts when operational changes are made to the treatment process.
SS. OPERATION AND MAINTENANCE OF MUNICIPAL FACILITIES: (continued)

B. O & M Manual

The approved operation and maintenance manual shall be kept available at the treatment plant. The operation and maintenance manual shall be updated as needed. The operation and maintenance manual shall contain the plant process control monitoring schedule. All operators are responsible for being familiar with, and using, this manual.

C. O & M Program

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

D. Short-term Reduction

If a Permittee contemplates a reduction in the level of treatment that would cause an exceedance of permit effluent limitations on a short-term basis for any reason, and such reduction cannot be avoided, the Permittee shall give written notification to the Department, if possible, 30 days prior to such activities, detailing the reasons for, length of time of, and the potential effects of the reduced level of treatment. If such a reduction involves a bypass, the requirements of Conditions GS and S6 will apply.

E. Electrical Power Failure

The Permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated wastes or wastes not treated in accordance with the requirements of this permit during electrical power failure at the treatment plant and/or sewage lift stations either by means of alternate power sources, standby generator, or retention of inadequately treated wastes.

F. Prevent Connection of Inflow

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

SS. CONSTRUCTION OR MAINTENANCE-RELATED OVERFLOW OR BYPASS

Bypasses of untreated or partially treated sewage during construction or maintenance shall be avoided if at all feasible.

If a construction or maintenance-related overflow or bypass is contemplated, the Permittee shall submit to the Department, not less than 90 days prior to the contemplated overflow or bypass, a report which describes in detail any work which will result in overflow or bypass of wastewater.
CONSTRUCTION OR MAINTENANCE-RELATED OVERFLOW OR BYPASS: (continued)

The report shall contain: (1) an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing; (2) a cost-effectiveness analysis of alternatives including comparative resource damage assessment; (3) the minimum and maximum duration of bypass under each alternative; (4) a recommendation as to the preferred alternative for conducting the bypass; (5) the project date of bypass initiation; (6) a statement of compliance with SEPA; and (7) a request for a water quality modification, as provided for in WAC 173-201A-100.

For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above shall be considered during preparation of the engineering report or facilities plan and plans and specifications and shall be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass. Final authorization to bypass may be granted after review of the above information, in accordance with General Condition G5. Authorization to bypass will be by administrative order.

RESIDUAL SOLIDS

A. Residual Solids Handling

The Permittee shall handle, utilize, and dispose of all residual solids in such a manner as to prevent its entry into state ground or surface waters.

B. Leachate

The Permittee shall not allow leachate from their residual solids to enter state surface waters without providing all known, available and reasonable methods of treatment, nor allow such leachate to violate the State Water Quality Standards, Chapter 173-201A WAC, or cause any adverse effect on state ground waters. The Permittee shall apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

C. Land Disposal or Utilization

Disposal or utilization of residual solids on land shall be in accordance with the requirements of the jurisdictional health department.

D. Solids Management Plan

The Permittee shall submit a residual solids management plan to the Department no later than January 1, 1995, for review and approval. The Permittee shall comply with the plan as approved by the Department. Any proposed revision or modification of the residual solids management plan shall be submitted to the Department for review and approval. The Permittee shall comply with any approved plan modifications. The Permittee shall submit an update of the residual solids management plan with the application for permit renewal 180 days prior to the expiration.
RESIDUAL SOLIDS: (continued)

E. Applicable Federal Law

This permit shall be modified, or alternatively, revoked and reissued to comply with any applicable standard or limitation promulgated under Section 405(d) (Disposal of Sewage Sludge) of the Clean Water Act, if the standard or limitation so issued or approved:

1. Contains different conditions or is otherwise more stringent than any condition in the permit; or

2. Controls any pollutant not limited in the permit.

The Permittee shall comply with the standard or limitation by no later than the compliance deadline specified in the applicable regulations as required by Section 405(d)(2)(D) of the Clean Water Act. The permit as modified or reissued under this paragraph shall also contain any other requirement of the Act then applicable.

F. Permit Modification, Revocation, Reissuance

The Department may establish specific sludge management requirements beyond those identified in this permit by permit modification or administrative order.

PRETREATMENT

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

2. If required by the Department, the Permittee shall perform an industrial user survey, or other activities (e.g., industrial user ordinance and local limits development), which are necessary for the proper administration of a state pretreatment program.

3. Significant commercial and industrial operations shall not be allowed to discharge wastes to the Permittee's sewerage system until they have received prior authorization from the Department in accordance with Chapter 90.48 RCW and Chapter 173-216 WAC, as amended.

4. General Prohibitions - In accordance with 40 CFR 403.5(a), non-domestic discharges which would pass through the treatment works or interfere with their operation or performance, shall not be discharged into the sewerage system.

5. Specific Prohibitions - In accordance with 40 CFR 403.5(b), the following non-domestic discharges shall not be discharged into the system.
S8. PRETREATMENT: (continued)

a. Pollutants that 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 that will cause corrosive structural damage to the Publicly Owned Treatment Works (POTW), but in no case discharges with pH lower than 5.0 standard units, unless the works are specifically designed to accommodate such discharges.

c. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.

d. Any pollutant, including oxygen demanding pollutants, (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

e. 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 exceeds 40°C (104°F) unless the Department, upon request of the Permittee, approves, in writing, alternate temperature limits.

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.

g. 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.

h. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.

S9. EFFLUENT MIXING

A. Requirements

The Permittee shall determine the degree of effluent and receiving water mixing which occurs within the mixing zone (as defined in Permit Condition S1.8).

The degree of mixing shall be determined during critical receiving water conditions or as close to predicted critical conditions as reasonably possible and approved by the Department. The critical period for estuaries and marine discharges is either the period of maximum stratification or period of minimum stratification and low tidal flux.
The critical period for estuaries is determined by methods given in Technical Support Document for Water Quality-based Toxics Control EPA/505/2-90-001. The dilution ratio shall be measured in the field with dye, salt, or other tracers using study protocols specified in this section or others approved by the Department. The use of models is an acceptable alternative or adjunct to a tracer study if the following conditions are met:

a. The diffuser is visually inspected for integrity or the diffuser has been recently tested for performance by the use of tracers.

b. The critical ambient conditions necessary for model input are known or will be established with field studies.

c. The recommended models are PLUMES and CORMIX. If the Permittee demonstrates that only minimal dilution is necessary to meet the numerical and narrative water quality standards, a simple model such as that given on page 75 of the Technical Support Document for Water Quality-based Toxics Control EPA/505/2-90-001 may be used.

The use of mixing zone models is also required if it is not feasible to conduct tracer studies during periods of critical ambient and effluent conditions and a., b., and c. are met. It is expected that computer modeling will be necessary to define the mixing within the zone of acute compliance, if one has been authorized. The study shall be completed and a report submitted to Ecology no later than January 15, 1995. The mixing data will be applied to effluent data to quantify pollutant concentrations within and at the edge of the mixing zone(s).

If the Permittee has information that natural background concentrations of a pollutant exceed the criteria in WAC 173-201A-040, this information may be submitted to the Department as part of the dilution analysis. If the results of the mixing study, biomonitoring and chemical analysis indicate that the concentration of any pollutant(s) exceeds or has a reasonable potential to exceed the State Water Quality Standards, Chapter 173-201A WAC, the Department may issue a regulatory order or modify this permit to require a reduction of pollutants to meet water quality standards.

The Permittee shall use some method of fixing and reporting the location of the outfall and mixing zone boundaries (i.e., triangulation off the shore, microwave navigation system, or using Loran or Global Positioning System (GPS) coordinates). The method of fixing station location and the actual station locations shall be identified in the report.
S9. EFFLUENT MIXING: (continued)

B. Protocols

The Permittee shall determine the dilution ratio using protocols outlined in the following references, approved modifications thereof, or by another method approved by the Department:


S10. ACUTE TOXICITY

Acute toxicity testing of dechlorinated final effluent shall be conducted for the purposes of characterizing the effluent. Based on the results of this testing, the Department may issue an order, or modify this permit to require additional toxicity testing: toxicity identification, toxicity reduction evaluation (TI/TRE); and/or to impose whole effluent toxicity effluent limitations. Whole effluent acute toxicity limitations shall be imposed pursuant to regulations adopted to implement RCW 90.48.520.

A. Testing

Acute toxicity testing of final dechlorinated effluent shall be conducted once per quarter for one year for the purpose of initially characterizing the effluent. Acute toxicity testing shall be conducted in accordance with the Monitoring Requirements specified in this section. The testing shall be conducted so as to determine an LC50 (lethal concentration for 50% of the test organisms) and an acute No Observable Effect Concentration (NOEC). The percent survival in 100% effluent shall also be reported.
S10. ACUTE TOXICITY: (continued)

Testing shall be conducted using two species: 1) Fathead minnow, *Pimephales promelas* (96-hour static-renewal test, method: EPA/600/4-90/027); and 2) Water flea, *Ceriodaphnia dubia, Daphnia pulex* or *Daphnia magna* (48 hour static test, method: EPA/600/4-90/027).

Testing shall be conducted using the above protocols or approved modifications thereof.

The Department will accept whole effluent acute toxicity data produced in the last two years as fulfillment of this section if it meets the information and quality control requirements of this section.


B. Monitoring Requirements

1. Testing shall be conducted on composite samples of dechlorinated effluent except when the Department or the Permittee, with the Department concurrence, determines that grab samples better represent toxicity. Water from the same source (natural or synthetic) as the water used for culturing the test organisms should be used as dilution water. Samples taken for toxicity testing should be cooled to 4 degrees Celsius and sent to the lab immediately. The lab should begin the toxicity testing as soon as possible but no later than 36 hours after the time that sampling was completed.

2. All tests for effluent characterization shall measure the response of the organisms in 0 percent effluent (control), 100% effluent, and a sufficient number of effluent dilutions to accurately determine an LC50 and an acute NOEC.

3. Permittees that have ammonia and/or chlorine in the effluent shall have the lab measure the ammonia and/or total residual chlorine of a split of each sample collected for toxicity testing. All samples taken for toxicity testing shall have the pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured by the laboratory prior to beginning the toxicity test.

4. The acute toxicity tests shall be conducted in accordance with the following protocol or approved modifications thereof:

   Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-90/027.

5. All quality assurance criteria used (including the LC50 calculation method) shall be in accordance with Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-90/027 or approved modifications thereof.
S10. ACUTE TOXICITY: (continued)

Test results which are not valid (e.g., control mortality exceeds acceptable level) will not be accepted and testing must be repeated.

C. Reporting Requirements

1. A written report of the toxicity test results shall be submitted to the Department within 60 days after each sampling interval. Each written report shall include all relevant information outlined in Section 12, Report Preparation, of Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-90/027 or approved modifications thereof. In addition, each report shall contain the bench sheets and the latest reference toxicant results for the test method. Two copies of this report shall be sent to the Northwest Regional Office, Department of Ecology. The initial written report must be submitted within 60 days of each reporting interval. The initial written report is due no later than March 15, 1994.

2. A final report on effluent characterization shall be submitted to the Department within 90 days after the last sample for effluent characterization. This final report shall list the LC50, acute NOEC, and percent survival in 100% effluent for all species, and submit any information on toxicity source control and treatability developed during the year. This final report is due no later than January 15, 1995.

S11. CHRONIC TOXICITY

Chronic toxicity testing of dechlorinated final effluent shall be conducted for the purposes of characterizing the effluent. Based on the results of this testing, the Department may issue an order; or modify this permit to require additional toxicity testing; toxicity identification, toxicity reduction evaluation (TI/TRE); and/or to impose whole effluent toxicity effluent limitations. Whole effluent chronic toxicity limitations shall be imposed pursuant to regulations adopted to implement RCW 90.48.520.

A. Testing

Chronic toxicity testing of final dechlorinated effluent shall be conducted once per quarter for one year for the purpose of characterizing the effluent. Chronic toxicity testing shall be conducted in accordance with the Monitoring Requirements specified in this section. The testing shall be conducted so as to determine the LC50 or EC50 (concentration providing a 50% adverse effect on growth, development, or reproduction in the test organisms) and a chronic NOEC.

Testing shall be conducted using two species:

Freshwater Chronic Toxicity Test Species & Methods
S11. CHRONIC TOXICITY: (continued)

Fathead minnow: *Pimephales promelas*  
Water flea: *Ceriodaphnia dubia*  

The Department will accept whole effluent chronic toxicity testing data produced in the last two years as fulfillment of this section if it meets the information and quality control requirements of this section.


B. Monitoring Requirements

1. Testing shall be conducted on composite samples of dechlorinated effluent except when the Department or the Permittee, with the Department concurrence, determines that grab samples better represent toxicity. Water from the same source (natural or synthetic) as the water used for culturing the test organisms should be used as dilution water. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius and sent to the lab immediately. The lab should begin the toxicity testing as soon as possible but no later than 36 hours after the time that sampling was completed.

2. All tests shall measure the response of the organisms in 0 percent (control) and a sufficient number of effluent dilutions to accurately determine an EC₅₀ or EC₉₀ and a chronic NOEC.

3. Permittees that have ammonia and/or chlorine in the effluent shall have the lab measure the ammonia and/or total residual chlorine of a split of each sample collected for toxicity testing. All samples taken for toxicity testing shall have the pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured by the laboratory prior to beginning the toxicity test.

4. The chronic toxicity tests shall be conducted in accordance with the following protocols or approved modifications thereof:

   - **Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**, EPA/600/4-89/001.
   - **Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms**, EPA/600/4-87/028.
   - **Annual Book of ASTM Standards, Section 11. Water and Environmental Technology, Volume II.04 Biological Effects and Environmental Fate.**
S11. CHRONIC TOXICITY: (continued)

5. The Permittee shall follow the quality assurance procedures discussed in the protocols cited in this section, or approved modifications thereof. Test results which are not considered valid (i.e., excessive control mortality, or inadequate control growth or reproduction) will not be accepted by the Department and the test(s) shall be repeated.

C. Reporting Requirements

1. A written report of the toxicity test results shall be submitted to the Department within 60 days after each sampling interval. Each written report shall include all relevant information outlined in Section 9, Report Preparation, of Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-89/001, March 1989, or approved modifications thereof. In addition, each report shall contain the bench sheets and the latest reference toxicant results for the test method. Two copies of this report shall be sent to the Northwest Regional Office, Department of Ecology. The initial written report is due no later than March 15, 1994.

2. A final report on effluent characterization shall be submitted to the Department within 90 days after the last sample for effluent characterization. This final report shall list the LC50, or EC50, and chronic NOEC data for all species and tests and detail any information on the results of any source control or treatability efforts during the year. The final report is due no later than January 15, 1995.

S12. COMBINED SEWER OVERFLOWS

A. The following is a list of combined sewer overflows (CSO's) which are occasional point sources of pollutants as a result of precipitation events. Discharges from these sites are prohibited except as a result of or during precipitation events. No authorization is given by this permit for discharge of CSO which causes adverse impacts that threaten beneficial uses of the receiving water or causes violations of applicable water quality standards.

<table>
<thead>
<tr>
<th>DISCHARGE NO.</th>
<th>CSO DESIGNATION</th>
<th>LOCATION</th>
<th>RECEIVING WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>B Avenue CSO</td>
<td>48° 30' 55&quot; N 122° 38' 03&quot; W</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td>003</td>
<td>M Avenue CSO</td>
<td>48° 31' 14&quot; N 122° 36' 56&quot; W</td>
<td>Guemes Channel</td>
</tr>
<tr>
<td>004</td>
<td>Q Avenue Overflow</td>
<td>48° 31' 18&quot; N 122° 36' 36&quot; W</td>
<td>Guemes Channel</td>
</tr>
</tbody>
</table>
S12. COMBINED SEWER OVERFLOWS: (continued)

B. No later than December 31 of each calendar year, the Permittee shall submit an annual CSO report to Ecology, for review and approval, which complies with the requirements of WAC 173-245-090(1).

C. In conjunction with the application for renewal of this permit, the Permittee shall submit an amendment of its CSO reduction plan to Ecology for review and approval. The amendment shall comply with the requirements of WAC 173-245-090(2).

D. In order to achieve the greatest reasonable reduction of combined sewer overflows at the earliest possible date the following elements of the approved combined sewer overflow reduction plan shall be accomplished in accordance with the following schedule of milestone dates:

1. Monitoring for volume and frequency of CSO's shall commence for outfalls 002 and 003 no later than October 1, 1994.

2. Monitoring for volume and frequency of CSO's shall commence for outfall 004 no later than October 1, 1996.
GENERAL CONDITIONS

G1. Discharge Violations:

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

G2. Proper Operation and Maintenance:

The Permittee shall at all times properly operate and maintain all facilities and systems of collection, treatment, and control (and related appurtenances) which are installed or used by the Permittee for pollution control.

G3. Reduced Production for Compliance:

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

G4. Non-compliance Notification:

If for any reason, the Permittee does not comply with, or will be unable to comply with, any of the discharge limitations or other conditions specified in the permit, the Permittee shall, at a minimum, provide the Department with the following information:

A. A description of the nature and cause of non-compliance, including the quantity and quality of any unauthorized waste discharges;

B. The period of non-compliance, including exact dates and times and/or the anticipated time when the Permittee will return to compliance; and

C. The steps taken, or to be taken, to reduce, eliminate, and prevent recurrence of the non-compliance.

In addition, the Permittee shall take immediate action to stop, contain, and clean up any unauthorized discharges and take all reasonable steps to minimize any adverse impacts to waters of the state and correct the problem. The Permittee shall notify the Department by telephone so that an investigation can be made to evaluate any resulting impacts and the corrective actions taken to determine if additional action should be taken.

In the case of any discharge subject to any applicable toxic pollutant effluent standard under Section 307(a) of the Clean Water Act, or which could constitute a threat to human health, welfare, or the environment, 40 CFR Part 122 requires that the information specified in Sections G4.A., G4.B., and G4.C., above, shall be provided not later than 24 hours from the time the Permittee becomes aware of the circumstances.
G4. Non-compliance Notification: (continued)

If this information is provided orally, a written submission covering these points shall be provided within five days of the time the Permittee becomes aware of the circumstances, unless the Department waives or extends this requirement on a case-by-case basis. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the conditions of this permit or the resulting liability for failure to comply.

G5. Bypass Prohibited:

The intentional bypass of wastes from all or any portion of a treatment works is prohibited unless the following four conditions are met:

A. Bypass is: (1) unavoidable to prevent loss of life, personal injury, or severe property damage; or (2) necessary to perform construction or maintenance-related activities essential to meet the requirements of the Clean Water Act and authorized by administrative order;

B. There are no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment down time, or temporary reduction or termination of production;

C. The Permittee submits notice of an unanticipated bypass to the Department in accordance with Condition G4. Where the Permittee knows or should have known in advance of the need for a bypass, this prior notification shall be submitted for approval to the Department, if possible, at least 30 days before the date of bypass (or longer if specified in the special conditions);

D. The bypass is allowed under conditions determined to be necessary by the Department to minimize any adverse effects. The public shall be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible.

"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. Severe property damage does not mean economic loss caused by delays in production. After consideration of the factors above and the adverse effects of the proposed bypass, the Department will approve or deny the request. Approval of a request to bypass will be by administrative order under RCW 90.48.120.

G6. Right of Entry:

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

A. To enter upon the premises where a discharge is located or where the permit must be kept under the terms and conditions of this


G6. Right of Entry: (continued)

B. To have access to and copy at reasonable times any records that must be kept under the terms of the permit;

C. To inspect at reasonable times any monitoring equipment or method of monitoring required in the permit;

D. To inspect at reasonable times any collection, treatment, pollution management, or discharge facilities; and

E. To sample at reasonable times any discharge of pollutants.

G7. Permit Modifications:

The Permittee shall submit a new application or supplement to the previous application where facility expansions, production increases, or process modifications will (1) result in new or substantially increased discharges of pollutants or a change in the nature of the discharge of pollutants, or (2) violate the terms and conditions of this permit.

G8. Permit Modified or Revoked:

After notice and opportunity for public hearing, this permit may be modified, terminated, or revoked during its term for cause as follows:

A. Violation of any terms or conditions of the permit;

B. Failure of the Permittee to disclose fully all relevant facts or misrepresentations of any relevant facts by the Permittee during the permit issuance process;

C. A change in any condition that requires either a temporary or a permanent reduction or elimination of any discharge controlled by the permit;

D. Information indicating that the permitted discharge poses a threat to human health or welfare;

E. A change in ownership or control of the source; or

F. Other causes listed in 40 CFR 122.62 and 122.63.

Permit modification, revocation and reissuance, or termination may be initiated by the Department or requested by any interested person.

G9. Reporting a Cause for Modification:

A Permittee who knows or has reason to believe that any activity has occurred or will occur which would constitute cause for modification or revocation and reissuance under Condition G8. or 40 CFR 122.62 must report such plans, or such information, to the Department so that a decision can be made on whether action to modify or revoke and reissue a permit will be required. The Department may then require submission of a new application. Submission of such application does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.
G10. **Toxic Pollutants:**

If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant and that standard or prohibition is more stringent than any limitation upon such pollutant in the permit, the Department shall institute proceedings to modify or revoke and reissue the permit to conform to the new toxic effluent standard or prohibition.

G11. **Plan Review Required:**

Prior to constructing or modifying any wastewater control facilities, detailed plans shall be submitted to the Department for approval in accordance with Chapter 173-240 WAC. Facilities shall be constructed and operated in accordance with the approved plan.

G12. **Other Requirements of 40 CFR:**

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

G13. **Compliance With Other Laws and Statutes:**

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

G14. **Additional Monitoring:**

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

G15. **Revocation for Non-Payment of Fees:**

The Department may revoke this permit if the permit fees established under Chapter 173-224 WAC are not paid.

G16. **Removed Substances:**

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

G17. **Duty to Reapply:**

The Permittee must reapply, for permit renewal, at least 180 days prior to the specified expiration date of this permit.
APPENDIX B

ANACORTES WWTP
DRAFT NPDES PERMIT
April 2, 1998

CERTIFIED MAIL
Z 224 364 987

Mr. John Franz, Plant Manager
City of Anacortes
PO Box 547
Anacortes, WA 98221

Dear Mr. Franz:

RE: National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit
No. WA-002025-7; City of Anacortes STP

Ecology has completed processing of your NPDES discharge permit application. The draft permit and fact sheet are enclosed for your consideration in evaluating the factual content of each document.

Please review your permit and fact sheet and provide comments to this office by April 30, 1998. Comments should address factual and editorial error associated with the fact sheet, permit and logical assumptions expressed.

Washington Department of Ecology
Northwest Regional Office
Water Quality Permit Coordinator
3190 160th Avenue SE
Bellevue, WA 98008-5452

We will publish the public notice after your review period. You may submit comments until the close of the public comment period. At that time, we will consider all comments received and will prepare a final permit and fact sheet.

We are available to explain the permit requirements or answer any questions you may have. Please call David Wright at (425) 649-7059 with your questions.

Sincerely,

Tricia Miller
Permit Coordinator
Northwest Regional Office

cc: Mike Herold, DOE-HQ
Dave Wright, Facility Manager
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT No. WA-002025-7

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504-8711

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

City of Anacortes
P.O. Box 547
Anacortes, Washington 98221

<table>
<thead>
<tr>
<th>Plant Location: 500 T Avenue</th>
<th>Receiving Water: Guemes Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anacortes, Washington 98221</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Water Body I.D. No.: WA-03-0020</th>
<th>Discharge Location</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Latitude: 48° 31' 23&quot; N</td>
</tr>
<tr>
<td></td>
<td>Longitude: 122° 36' 31&quot; W</td>
</tr>
</tbody>
</table>

| Plant Type: Activated Sludge |

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

John Glynn
Water Quality Supervisor
Northwest Regional Office
Washington State Department of Ecology
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G10. OTHER REQUIREMENTS OF 40 CFR
G11. ADDITIONAL MONITORING
G12. PAYMENT OF FEES
G13. PENALTIES FOR VIOLATING PERMIT CONDITIONS
<table>
<thead>
<tr>
<th>Permit Section</th>
<th>Submittal</th>
<th>Frequency</th>
<th>First Submittal Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3.</td>
<td>Discharge Monitoring Report</td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td>S3.</td>
<td>Summary Report (EPA 3320-1)</td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td>S8C.</td>
<td>Acute Toxicity Characterization Data</td>
<td>2/permit cycle</td>
<td>April 30, 2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>October 31, 2002</td>
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<tr>
<td>S9C.</td>
<td>Chronic Toxicity Characterization Data</td>
<td>2/permit cycle</td>
<td>April 30, 2002</td>
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<tr>
<td></td>
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<td>October 31, 2002</td>
</tr>
<tr>
<td>S10.</td>
<td>Chemical Analysis of Influent and Effluent</td>
<td>1/quarter</td>
<td>December 31, 2002</td>
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<tr>
<td>S11.</td>
<td>Combined Sewer Overflow Report</td>
<td>Annually</td>
<td>April 15, 1999</td>
</tr>
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<td>S11.</td>
<td>Combined Sewer Overflow Reduction Plan Amendment</td>
<td>At permit renewal</td>
<td>December 31, 2002</td>
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<tr>
<td>G1.</td>
<td>Notice of Change in Authorization</td>
<td>as necessary</td>
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<td>G7.</td>
<td>Application for permit renewal</td>
<td>1/permit cycle</td>
<td>December 31, 2002</td>
</tr>
</tbody>
</table>
SPECIAL CONDITIONS

S1. DISCHARGE LIMITATIONS

A. Effluent Limitations

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

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Average Monthly</th>
<th>Average Weekly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemical Oxygen Demandb (5 day)</td>
<td>30 mg/L, 801 lbs/day</td>
<td>45 mg/L, 1201 lbs/day</td>
</tr>
<tr>
<td>Total Suspended Solidsb</td>
<td>30 mg/L, 801 lbs/day</td>
<td>45 mg/L, 1201 lbs/day</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>200 /100 mL</td>
<td>400 /100 mL</td>
</tr>
<tr>
<td>pHc</td>
<td>Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.</td>
<td></td>
</tr>
<tr>
<td>Total Residual Chlorine</td>
<td>154 ug/L</td>
<td>403 ug/L</td>
</tr>
</tbody>
</table>

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

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

cIndicates the range of permitted values. When pH is continuously monitored, excursions between 5.0 and 6.0, or 9.0 and 10.0 shall not be considered violations provided no single excursion exceeds 60 minutes in length and total excursions do not exceed 7 hours and 30 minutes per month. Any excursions below 5.0 and above 10.0 are violations. The instantaneous maximum and minimum pH shall be reported monthly.

B. Mixing Zone Descriptions

The maximum boundaries of the mixing zones are defined as follows:
1. The horizontal dimensions and boundaries of the mixing zone are as depicted in the following diagram:

The mixing zone extends vertically from the outfall to an upper boundary at the water surface. The most restrictive upper boundary occurs at Mean Lower Low Water (MLLW). The CCEC is equal to 1.23%.

2. The allowable zone of acute criteria exceedance dimensions and boundaries are depicted in the diagram above by the shaded area. The zone of acute criteria exceedance extends to an upper boundary surface at MLLW and shall not extend horizontally more than 23.1 feet from the diffuser. The ACEC is equal to 3.22%.

3. Note: The mixing zone diagram is schematic in nature and does not account for the boundary restricted by the pier.
### S2. MONITORING REQUIREMENTS

#### A. Monitoring Schedule

<table>
<thead>
<tr>
<th>Category</th>
<th>Parameter</th>
<th>Units</th>
<th>Sample Point</th>
<th>Minimum Sampling Frequency</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater influent</td>
<td>Flow</td>
<td>MGD</td>
<td>7/7</td>
<td>Cont.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BOD5</td>
<td>mg/l</td>
<td>3/7</td>
<td>24 HC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TSS</td>
<td>mg/l</td>
<td>3/7</td>
<td>24 HC</td>
<td></td>
</tr>
<tr>
<td>Wastewater Effluent</td>
<td>BOD5</td>
<td>mg/l</td>
<td>3/7</td>
<td>24 HC</td>
<td></td>
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<tr>
<td></td>
<td>&quot;</td>
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<tr>
<td></td>
<td>TSS</td>
<td>mg/l</td>
<td>3/7</td>
<td>24 HC</td>
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<td>&quot;</td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td>Fecal Coliform Bacteria</td>
<td>CFU/100 mL</td>
<td>3/7</td>
<td>GRAB</td>
<td></td>
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<tr>
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<td>&quot;</td>
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</tr>
<tr>
<td></td>
<td>Total Available Residual Chlorine</td>
<td>ug/l</td>
<td>7/7</td>
<td>GRAB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>pH</td>
<td>Standard Units</td>
<td>7/7</td>
<td>GRAB</td>
<td></td>
</tr>
<tr>
<td>WET Testing- Acute</td>
<td></td>
<td></td>
<td></td>
<td>Twice in year 2002</td>
<td>24HC</td>
</tr>
<tr>
<td>WET Testing- Chronic</td>
<td></td>
<td></td>
<td></td>
<td>Twice in year 2002</td>
<td>24HC</td>
</tr>
<tr>
<td>Additional Chemical Analysis of Influent and Effluent</td>
<td>Priority Pollutant Metals</td>
<td></td>
<td>Quarterly in year 2002</td>
<td>24HC</td>
<td></td>
</tr>
</tbody>
</table>

#### B. Sampling and Analytical Procedures

Samples and measurements taken to meet the requirements of this permit shall be representative of the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets and maintenance-related conditions affecting effluent quality.
Sampling and analytical methods used to meet the water and wastewater monitoring requirements specified in this permit shall conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136 or to the latest revision of Standard Methods for the Examination of Water and Wastewater (APHA), unless otherwise specified in this permit or approved in writing by the Department of Ecology (Department).

C. Flow Measurement

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

D. Laboratory Accreditation

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

S3. REPORTING AND RECORDKEEPING REQUIREMENTS

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

A. Reporting

The first monitoring period begins on the effective date of the permit. Monitoring results shall be submitted monthly. Monitoring data obtained during the previous month shall be summarized and reported on a form provided, or otherwise approved, by the Department, and be received no later than the 15th day of the month following the completed reporting period, unless otherwise specified in this permit. Priority pollutant analysis data shall be submitted no later than 45 days following the reporting period. The report(s) shall be sent to the Department of Ecology, Northwest Regional Office, 3190 160th Avenue S.E., Bellevue, Washington 98008-5452.
All lab reports providing data for organic and metal parameters shall include the following information: sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), lab practical quantitation limit (PQL), reporting units and concentration detected.

In addition to the monthly report, a monthly summary report form (EPA No. 3320-1) shall be received no later than the 15th day of the following month. This report is limited to the parameters specified in condition S1.

B. Records Retention

The Permittee shall retain records of all monitoring information for a minimum of three years. Such information shall include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by the Director.

C. Recording of Results

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

D. Additional Monitoring by the Permittee

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

E. Noncompliance Notification

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

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the violation, and correct the problem;

2. Repeat sampling and analysis of any violation and submit the results to the Department within 30 days after becoming aware of the violation;

3. Immediately notify the Department of the failure to comply; and
4. Submit a detailed written report to the Department within thirty days (5 days for upsets and bypasses), unless requested earlier by the Department. The report should describe the nature of the violation, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of the resampling, and any other pertinent information.

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. Reporting - Shellfish Protection

Unauthorized discharges such as collection system overflows, plant bypasses, or failure of the disinfection system, shall be reported immediately to the Department of Ecology and the Department of Health, Shellfish Program. The Department of Ecology’s Northwest Regional Office 24-hr. number is (425) 649-7000, and the Department of Health’s Shellfish 24-hr. number is 360-753-5992.

S4. FACILITY LOADING

A. Design Criteria

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

- Average flow for the maximum month: 3.2 MGD
- BOD₅ loading for maximum month: 5316 lb/day
- TSS loading for maximum month: 5674 lb/day

B. Plans for Maintaining Adequate Capacity

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

1. Analysis of the present design including the introduction of any process modifications that would establish the ability of the existing facility to achieve the effluent limits and other requirements of this permit at specific levels in excess of the existing design criteria specified in paragraph A above.
2. Reduction or elimination of excessive infiltration and inflow of uncontaminated ground and surface water into the sewer system.

3. Limitation on future sewer extensions or connections or additional wasteloads.

4. Modification or expansion of facilities necessary to accommodate increased flow or wasteload.

5. Reduction of industrial or commercial flows or waste loads to allow for increasing sanitary flow or wasteload.

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

C. Notification of New or Altered Sources

The Permittee shall submit written notice to the Department whenever any new discharge or increase in volume or change in character of an existing discharge into the sewer is proposed which: (1) would interfere with the operation of, or exceed the design capacity of, any portion of the collection or treatment system; (2) is not part of an approved general sewer plan or approved plans and specifications; or would be subject to pretreatment standards under 40 CFR Part 403 and Section 307(b) of the Clean Water Act. This notice shall include an evaluation of the system's ability to adequately transport and treat the added flow and/or wasteload.

S5. OPERATION AND MAINTENANCE

The Permittee shall at all times be responsible for the proper operation and maintenance of any facilities or systems of control installed to achieve compliance with the terms and conditions of the permit.

A. Certified Operator

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

B. O & M Program

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

C. Short-term Reduction

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

D. Electrical Power Failure

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

E. Prevent Connection of Inflow

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

F. Bypass Procedures

The Permittee shall immediately notify the Department of any spill, overflow, or
bypass from any portion of the collection or treatment system.

The bypass of wastes from any portion of the treatment system is prohibited unless
one of the following conditions (1, 2, or 3) applies:

1. Unavoidable Bypass -- 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.

   If the resulting bypass from any portion of the treatment system results in
   noncompliance with this permit the Permittee shall notify the Department
   in accordance with condition S3.E "Noncompliance Notification."
2. Anticipated Bypass That Has The Potential to Violate Permit Limits or Conditions -- Bypass is authorized by an administrative order issued by the Department. The Permittee shall apply to the Department for the administrative order at least 30 days before the planned date of bypass. The written submission shall contain (1) a description of the bypass and its cause; (2) an analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing; (3) a cost-effectiveness analysis of alternatives including comparative resource damage assessment; (4) the minimum and maximum duration of bypass under each alternative; (5) a recommendation as to the preferred alternative for conducting the bypass; (6) the projected date of bypass initiation; (7) a statement of compliance with SEPA; (8) a request for a water quality modification, as provided for in WAC 173-201A-110, and (9) steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

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

The Department will consider the following prior to issuing an administrative order:

a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of the permit.

b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.

c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, the Department will approve or deny the request. The public shall be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by the Department under RCW 90.48.120.
3. **Bypass For Essential Maintenance Without the Potential to Cause Violation of Permit Limits or Conditions** -- Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of the permit, or adversely impact public

G. **Operations and Maintenance Manual**

The approved Operations and Maintenance Manual shall be kept available at the treatment plant and all operators shall follow the instructions and procedures of this Manual.

The O&M Manual shall include:

1. Emergency procedures for plant shutdown and cleanup in event of wastewater system upset or failure;
2. Plant maintenance procedures;
3. The treatment plant process control monitoring schedule;

**S6. PRETREATMENT**

A. **General Requirements**

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

B. **Discharge Authorization Required**

Significant industrial users (SIUs) shall not be allowed to discharge wastes to the Permittee's sewerage system until they have received prior authorization from the Department in accordance with Chapter 90.48 RCW and Chapter 173-216 WAC, as amended. The Permittee shall immediately notify the Department of any proposed new sources, as defined in 40 CFR 403.3(k), from significant commercial or industrial operations.

C. **General Prohibitions**

In accordance with 40 CFR 403.5(a), a nondomestic discharger may not introduce into the Permittee's sewerage system any pollutant(s) that cause pass through or interference.
D. **Specific Prohibitions**

In accordance with 40 CFR 403.5(b), the following nondomestic discharges shall not be discharged into the Permittee's sewerage treatment system.

1. Pollutants that 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).

2. Pollutants that will cause corrosive structural damage to the Publicly Owned Treatment Works (POTW), but in no case discharges with pH lower than 5.0 standard units, unless the works are specifically designed to accommodate such discharges.

3. Solid or viscous pollutants in amounts that could cause obstruction to the flow in sewers or otherwise interfere with the operation of the POTW.

4. Any pollutant, including oxygen demanding pollutants, (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW.

5. 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 exceeds 40°C (104°F) unless the Department, upon request of the Permittee, approves, in writing, alternate temperature limits.

6. Petroleum oil, nonbiodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.

7. 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.

8. Any trucked or hauled pollutants, except at discharge points designated by the Permittee.

E. **Notification of Industrial User Violations**

The Permittee shall notify the Department if any nondomestic user violates the prohibitions listed in S6.C and S6.D above.

F. **Industrial User Survey**

If required by the Department, the Permittee shall perform an industrial user survey, or other activities (e.g., sewer use ordinance and local limits development),
which are necessary for the proper administration of the state pretreatment program

S7. RESIDUAL SOLIDS

Residual solids include screenings, grit, scum, primary sludge, waste activated sludge and other solid waste. The Permittee shall store and handle all residual solids in such a manner so as to prevent their entry into state ground or surface waters.

S8. ACUTE TOXICITY

A. Testing Requirements

The Permittee shall test final effluent for acute toxicity in January, 2002 and in July, 2002 and submit the results of the testing to the Department within 90 days of the test date. Testing shall be conducted on each of the two species listed below on each test date. The Permittee shall conduct acute toxicity testing on a series of five concentrations of effluent and a control in order to be able to determine appropriate point estimates and an NOEC. The series must include the ACEC of 3.22% as the minimum concentration and 100% effluent. The percent survival in 100% effluent shall also be reported.

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

1) Fathead minnow, *Pimephales promelas* (96 hour static-renewal test, method: EPA/600/4-90/027F)

2) Daphnid, *Ceriodaphnia dubia, Daphnia pulex,* or *Daphnia magna* (48 hour static test, method: EPA/600/4-90/027F).

B. Sampling and Reporting Requirements

1. All reports for whole effluent toxicity tests shall be submitted in accordance with the most recent Department of Ecology specifications regarding format and content. Reports shall contain bench sheets and reference toxicant results for test methods. The effluent and reference toxicant test results shall also be submitted as electronic files on floppy disks in the Toxicity Standardized Electronic Reporting Format (TSERF) or other compatible format.

2. Testing shall be conducted on 24-hour composite effluent samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.
3. All samples taken for toxicity testing shall have ammonia, chlorine, pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured prior to test initiation.

4. All toxicity tests shall meet quality assurance criteria in the most recent versions of the EPA manual listed in subsection A. and the Department of Ecology Publication # WQ-R-95-80, Whole Effluent Toxicity Testing Regulatory Guidance and Test Review Criteria. If test results are determined to be invalid or anomalous by the Department, testing shall be repeated with freshly collected effluent. If control performance does not meet protocol standards for acceptability, the test shall be repeated with freshly collected effluent.

5. Control water and dilution water shall be laboratory water or pristine natural water meeting the requirements of the EPA manual listed in subsection A. Dilution water for toxicity testing shall be of sufficient quality for good control performance.

6. The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.

7. All whole effluent toxicity tests that involve hypothesis testing and do not comply with the acute statistical power standard of 29% as defined in WAC 173-205-020 must be repeated on a fresh sample with an increased number of replicates to increase the power.

S9 CHRONIC TOXICITY

A. Testing Requirements

The Permittee shall test final effluent for chronic toxicity in January, 2002 and in July, 2002 and submit the results of the testing to the Department within 90 days of the test date. All of the chronic toxicity tests listed below shall be conducted on each sample for each species.

The Permittee shall conduct chronic toxicity testing on a series of at least five concentrations of effluent and a control in order to be able to determine appropriate point estimates and an NOEC. This series of dilutions shall include the acute critical effluent concentration (ACEC). The series of concentrations shall include the ACEC of 3.22% effluent and the CCEC of 1.23% effluent. The Permittee shall compare the ACEC to the control using hypothesis testing at the 0.05 level of significance as described in Appendix H, EPA/600/4-89/001.

Chronic toxicity tests shall be conducted with the following species and the most recent version of the following protocols:
### Saltwater Chronic Toxicity Test Species

<table>
<thead>
<tr>
<th>Species</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mysid shrimp</td>
<td><em>Mysidopsis bahia</em></td>
</tr>
<tr>
<td>Silverside minnow</td>
<td><em>Menidia beryllina</em></td>
</tr>
</tbody>
</table>

#### B. Sampling and Reporting Requirements

1. All reports for whole effluent toxicity testing shall be submitted in accordance with the most recent Department of Ecology specifications regarding format and content. Reports shall contain bench sheets and reference toxicant results for test methods. The effluent and reference toxicant test results shall also be submitted as electronic files on floppy disks in the Toxicity Standardized Electronic Reporting Format (TSERF) or other compatible format.

2. Testing shall be conducted on 24-hour composite effluent samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.

3. All samples taken for toxicity testing shall have ammonia, chlorine, pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured prior to test initiation.

4. All toxicity tests shall meet quality assurance criteria in the most recent versions of the EPA manual or other test method listed in subsection A and the Department of Ecology Publication # WQ-R-95-80, *Whole Effluent Toxicity Testing Regulatory Guidance and Test Review Criteria*. If test results are determined to be invalid or anomalous by the Department, testing shall be repeated with freshly collected effluent. If control performance does not meet protocol standards for acceptability, the test shall be repeated with freshly collected effluent.

5. Control water and dilution water shall be laboratory water or pristine natural water meeting the requirements of the EPA manual listed in subsection A. Dilution water for toxicity testing shall be of sufficient quality for good control performance.

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

S10. ADDITIONAL CHEMICAL ANALYSIS OF INFLUENT AND EFFLUENT

A. General Requirements

The Permittee shall conduct chemical analyses of influent and effluent samples collected from the wastewater treatment system in accordance with protocols, monitoring requirements, and QA/QC procedures specified in this section.

Priority pollutant metals are to be sampled on a calendar quarterly basis in the year 2002 to assist in determining if any change in effluent characteristics have occurred. This data shall be submitted with the application for renewal no later than December 31, 2002.

S11. COMBINED SEWER OVERFLOWS

A. Discharge Locations

The following is a list of combined sewer overflows (CSOs), which are occasional point sources of pollutants as a result of precipitation events. Discharges from these sites are prohibited except as a result of and during precipitation events. No authorization is given by this permit for discharge from a CSO that causes adverse impacts that threaten characteristic uses of the receiving water as identified in the Water Quality Standards, Chapter 173-201A WAC.

<table>
<thead>
<tr>
<th>DISCHARGE NO.</th>
<th>LOCATION</th>
<th>RECEIVING WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>B Avenue CSO</td>
<td>Latitude: 48° 30' 55&quot; N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Longitude: 122° 38' 03&quot; W</td>
</tr>
<tr>
<td>003</td>
<td>M Avenue CSO</td>
<td>Latitude: 48° 31' 14&quot; N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Longitude: 122° 36' 56&quot; W</td>
</tr>
<tr>
<td>004</td>
<td>Q Avenue CSO</td>
<td>Latitude: 48° 31' 18&quot; N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Longitude: 122° 36' 34&quot; W</td>
</tr>
</tbody>
</table>

Guemes Channel
B. Combined Sewer Overflow Report

By April 15, 1999, and annually thereafter, the Permittee shall submit an annual CSO Report to the Department for review and approval, which complies with the requirements of WAC 173-245-090(1).

C. Combined Sewer Overflow Reduction Plan Amendment

In conjunction with the application for renewal of this permit, the Permittee shall submit an amendment of its CSO Reduction Plan to the Department for review and approval. The amendment shall comply with the requirements of WAC 173-245-090(2).
GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

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

A. All permit applications shall be signed by either a principal executive officer or a ranking elected official.

B. All reports required by this permit and other information requested by the Department shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above and submitted to the Department, and

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

C. Changes to authorization. If an authorization under paragraph B.2. above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of B.2. must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.

D. Certification. Any person signing a document under this section shall make the following certification:

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

G2. RIGHT OF ENTRY

The Permittee shall allow an authorized representative of the Department, upon the presentation of credentials and such other documents as may be required by law:
A. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit;

B. To have access to and copy at reasonable times any records that must be kept under the terms of the permit;

C. To inspect at reasonable times any monitoring equipment or method of monitoring required in the permit;

D. To inspect at reasonable times any collection, treatment, pollution management, or discharge facilities; and

E. To sample at reasonable times any discharge of pollutants.

G3. PERMIT ACTIONS

This permit shall be subject to modification, suspension, or termination, in whole or in part by the Department for any of the following causes:

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 material change in the condition of the waters of the state; or

E. Nonpayment of fees assessed pursuant to RCW 90.48.465.

The Department may also modify this permit, including the schedule of compliance or other conditions, if it determines good and valid cause exists, including promulgation or revisions of regulations or new information.

G4. REPORTING A CAUSE FOR MODIFICATION

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

G5. PLAN REVIEW REQUIRED

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

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

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

G7. DUTY TO REAPPLY

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

G8. REMOVED SUBSTANCES

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

G9. TOXIC POLLUTANTS

If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant and that standard or prohibition is more stringent than any limitation upon such pollutant in the permit, the Department shall institute proceedings to modify or revoke and reissue the permit to conform to the new toxic effluent standard or prohibition.

G10. OTHER REQUIREMENTS OF 40 CFR

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

G11. ADDITIONAL MONITORING

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

G12. PAYMENT OF FEES

The Permittee shall submit payment of fees associated with this permit as assessed by the Department. The Department may revoke this permit if the permit fees established under Chapter 173-224 WAC are not paid.

G13. PENALTIES FOR VIOLATING PERMIT CONDITIONS

- Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished
FACT SHEET FOR NPDES PERMIT WA002025-7
CITY OF ANACORTES

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INTRODUCTION

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

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

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

<table>
<thead>
<tr>
<th>General Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
</tr>
<tr>
<td>Facility Name and Address</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Responsible Official</td>
</tr>
<tr>
<td>Facility Contact</td>
</tr>
<tr>
<td>Type of Treatment</td>
</tr>
<tr>
<td>Discharge Location</td>
</tr>
<tr>
<td>Latitude</td>
</tr>
<tr>
<td>Longitude</td>
</tr>
</tbody>
</table>
BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

The treatment facility includes a septage receiving station, which consists of septage holding tanks, a septage grinder, and a septage pump. Ground septage is pumped into the headworks influent channel. The WWTP includes raw sewage influent pumping with two archimedes screw-type pumps which lift the sewage vertically 20-25 feet to the headworks influent channel. The WWTP includes mechanical bar screens, flow measurement in parshall flumes, primary clarification, aeration in two basins, secondary clarification, disinfection, de-chlorination with sodium bisulfite, and effluent pumping when required at high tide.

Screenings removed in the mechanical bar screens are discharged on a conveyor, dewatered in a screening press, then discharged into the grit container. Primary sludge from the primary clarifiers is degritted by two cyclone separators, and then washed and dewatered. Washed and dewatered grit is discharged to the grit container. Waste activated sludge is thickened in the gravity thickeners together with the primary sludge. Thickened primary sludge and waste activated sludge are conditioned and then dewatered on a belt filter press. Dewatered sludges are incinerated in a fluidized bed incinerator.

DISCHARGE OUTFALL

The disinfected secondary effluent is discharged to Guemes Channel through a 24-inch diameter outfall pipe which terminates in a 60 foot multi-port diffuser. The diffuser consists of seven 6-inch diameter ports spaced at approximately 9 foot intervals angled 30 degrees above the horizontal. The average diffuser depth is approximately 31 feet below mean lower low water (MLLW). The diffuser is located parallel to a catwalk inside the designated outer harbor line on the west side of the Port of Anacortes Pier 2.

RESIDUAL SOLIDS

Residual solids generated at the plant includes screenings, grit, scum, primary sludge, waste activated sludge, and incinerated ash. Screenings and washed grit are disposed of at the Skagit County Regional Transfer Station. Primary sludge, waste activated sludge, and scum are combined, dewatered, and incinerated in a fluidized bed incinerator. Ash from the incinerator is disposed of at the Skagit County Regional Transfer Station also. Ultimate disposal of the solids occurs at the Klickitat Regional Disposal Landfill.

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PERMIT STATUS

The previous permit for this facility was issued on September 17, 1993. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, and Total Residual Chlorine.

An application for permit renewal was submitted to the Department on November 3, 1997 and accepted by the Department on November 17, 1997.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on February 11, 1997. A compliance inspection with sampling was conducted on this date.

During the history of the previous permit, the Permittee has remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

WASTEWATER CHARACTERIZATION

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>1.96 MGD monthly average</td>
</tr>
<tr>
<td>BOD₅</td>
<td>17 mg/L max monthly avg.</td>
</tr>
<tr>
<td>TSS</td>
<td>12.7 mg/L max monthly avg.</td>
</tr>
<tr>
<td>Ammonia</td>
<td>3.49 mg/L max monthly avg.</td>
</tr>
<tr>
<td>pH</td>
<td>6.7-7.2</td>
</tr>
<tr>
<td>Chlorine</td>
<td>0.34 mg/L max monthly avg.</td>
</tr>
<tr>
<td>Copper</td>
<td>36 ug/L max measured value</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.7 ug/L max measured value</td>
</tr>
<tr>
<td>Lead</td>
<td>23 ug/L max measured value</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.5 ug/L max measured value</td>
</tr>
<tr>
<td>Zinc</td>
<td>190 ug/L max measured value</td>
</tr>
</tbody>
</table>

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.
FACT SHEET FOR NPDES PERMIT WA002025-7
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The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis and the limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported and they are not controllable at the source and they don’t have a reasonable potential to cause a water quality violation. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology.

DESIGN CRITERIA

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

The detailed design criteria for the upgraded wastewater treatment plant are based upon the information contained in the approved Operations and Maintenance Manual (10-23-91).

Average Flow of the Maximum Month 3.2 MGD
Influent BOD₅ 5316 lb/day
Influent TSS 5674 lb/day

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

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

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

Table 2: Technology-based Limits.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH:</td>
<td>shall be within the range of 6 to 9 standard units.</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>Monthly Geometric Mean = 200 organisms/100 mL</td>
</tr>
<tr>
<td></td>
<td>Weekly Geometric Mean = 400 organisms/100 mL</td>
</tr>
<tr>
<td>BOD₅ (concentration)</td>
<td>Average Monthly Limit is the most stringent of the following:</td>
</tr>
<tr>
<td></td>
<td>- 30 mg/L</td>
</tr>
<tr>
<td></td>
<td>- may not exceed fifteen percent (15%) of the average influent concentration</td>
</tr>
<tr>
<td></td>
<td>Average Weekly Limit = 45 mg/L</td>
</tr>
</tbody>
</table>
FACT SHEET FOR NPDES PERMIT WA002025-7
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Parameter | Limit
--- | ---
TSS (concentration) | Average Monthly Limit is the most stringent of the following:
| - 30 mg/L
| - may not exceed fifteen percent (15%) of the average influent concentration
| Average Weekly Limit = 45 mg/L

The existing permit has a technology based chlorine limit of 0.5 mg/L monthly average and 1.0 mg/L daily maximum and the facility has been able to comply with it. The proposed permit will require a water quality based effluent limit now that the de-chlorination system is installed and operational.

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

Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly design flow 3.2 MGD x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 801 lb./day.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 1201 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

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

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

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

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

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

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

ANTIDEGRADATION

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

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

CRITICAL CONDITIONS

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

MIXING ZONES

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

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

The facility discharges to Guemes Channel which is designated as a Class A Marine receiving water in the vicinity of the outfall. Characteristic uses include the following:

- fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

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

SURFACE WATER QUALITY CRITERIA

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

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Standard/Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal Coliforms</td>
<td>14 organisms/100 mL maximum geometric mean</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>6 mg/L minimum</td>
</tr>
<tr>
<td>Temperature</td>
<td>16 degrees Celsius maximum or incremental increases above background</td>
</tr>
<tr>
<td>pH</td>
<td>7.0 to 8.5 standard units</td>
</tr>
<tr>
<td>Turbidity</td>
<td>less than 5 NTUs above background</td>
</tr>
<tr>
<td>Toxics</td>
<td>No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)</td>
</tr>
</tbody>
</table>

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

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

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the effluent mixing study performed by the Permittee using the UDKHDEN MODEL for the zone of acute criteria exceedance and the UM/PLUMES model to estimate far field dilution at the chronic mixing zone boundary.
Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants—their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

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

**BOD$_5$**—Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD$_5$ was placed in the permit.

**Temperature**—

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

**pH**—Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

**Fecal coliform**—The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 81:1.

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

**Toxic Pollutants**—Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, and heavy metals. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.
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The determination of the reasonable potential for chlorine, ammonia, cadmium, copper, lead, mercury, and zinc to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The parameters used in the critical condition modeling are as follows: acute dilution factor 31:1, chronic dilution factor 81:1, receiving water density profile as measured in the field during the mixing zone study conducted in August 1995.

No valid ambient background data was available. A determination of reasonable potential using zero for background was conducted. Water quality criteria for metals in Chapter 173-201A WAC are based on the total recoverable fraction of the metal.

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

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

Effluent limits were derived for Chlorine, which were determined to have a reasonable potential to cause a violation of the Water Quality Standards. Effluent limits were calculated using methods from EPA, 1991 as shown in Appendix C.

The resultant effluent limits are as follows:

Chlorine: Average Monthly Limit 154 ug/L Maximum Daily Limit 403 ug/L

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable
of calculating an NOEC, LC$_{50}$, EC$_{50}$, LC$_{25}$, etc. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

The WET tests during effluent characterization conducted in 1994 indicate that no reasonable potential exists to cause receiving water acute toxicity, and the Permittee will not be given an acute WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

The WET tests during effluent characterization in 1994 indicate that no reasonable potential exists to cause receiving water chronic toxicity, and the Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

**HUMAN HEALTH**

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

The Department has determined that the applicant's discharge does not contain chemicals of concern based on existing data or knowledge. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

**SEDIMENT QUALITY**

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

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.
**COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED 9-17-93**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>PROPOSED EFFLUENT LIMITATIONS*: OUTFALL #001</th>
<th>PREVIOUS EFFLUENT LIMITATIONS OUTFALL #001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Monthly</td>
<td>Average Weekly</td>
</tr>
<tr>
<td>Flow</td>
<td>3.2 MGD</td>
<td></td>
</tr>
<tr>
<td>Biochemical Oxygen Demand (5 day)</td>
<td>30 mg/L</td>
<td>45 mg/L (1201 lbs/day)</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>30 mg/L</td>
<td>45 mg/L (1201 lbs/day)</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria</td>
<td>200/100 mL</td>
<td>400/100 mL</td>
</tr>
<tr>
<td>pH</td>
<td>shall not be outside the range 6.0 to 9.0</td>
<td>shall not be outside the range 6.0 to 9.0</td>
</tr>
</tbody>
</table>

**MONITORING REQUIREMENTS**

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

Monitoring for priority pollutant metals in the fourth year of the permit is being required to reconfirm characterization of the effluent. The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's Permit Writer's Manual (July 1994) for an activated sludge treatment plant.
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Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, Accreditation of Environmental Laboratories.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 273-220-210).

PREVENTION OF FACILITY OVERLOADING

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

OPERATION AND MAINTENANCE (O&M)

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

RESIDUAL SOLIDS HANDLING

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

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the Skagit County Health Department.

PRETREATMENT

The Department may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern. Any permit modification is subject to formal due process procedures pursuant to state and federal law and regulation.
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COMBINED SEWER OVERFLOWS

This Permittee has occasional low volume combined sewer overflows from three different overflow outfalls. The department approved a CSO reduction plan in January 17, 1991. The city’s plan for reducing overflows generally involves separating combined sewers and reducing inflow and infiltration into the sewer system. Overflow outfalls 002 and 003 are equipped for measuring overflow quantity and duration. Overflow outfall 004 is not yet equipped for measuring overflows because of a damaged pipe in the sewer system; repairs needed to install flow measuring equipment are scheduled over the next two years. Overflow volume and frequency from the three outfalls is similar.

In 1995 eight combined sewer overflows occurred from outfalls 002 and 003 for a total discharge volume 42,000 gallons. In 1996 three combined sewer overflows occurred from outfalls 002 and 003 for a total discharge volume 25,000 gallons. The City is making satisfactory progress towards reducing overflows to an average of one per year.

In accordance with RCW 90.48.480 and Chapter 173-245 WAC, proposed permit Condition S.11 requires the Permittee to submit an annual Combined Sewer Overflow (CSO) report and to update its CSO reduction plan at the time of permit renewal.

GENERAL CONDITIONS

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

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Conditions G7 relates to permit renewal. Condition G8 prohibits the reintroduction of removed substances back into the effluent. Condition G9 states that the Department will modify or revoke and reissue the permit to conform to more stringent toxic effluent standards or prohibitions. Condition G10 incorporates by reference all other requirements of 40 CFR 122.41 and 122.42. Condition G11 notifies the Permittee that additional monitoring requirements may be established by the Department. Condition G12 requires the payment of permit fees. Condition G13 describes the penalties for violating permit conditions.
PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

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

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

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for 5 years.
REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

City of Anacortes 1995 Combined Sewer Overflow Report

City of Anacortes 1996 Combined Sewer Overflow Report


Metcalf and Eddy.


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


Washington State Department of Ecology.


Water Pollution Control Federation.


APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

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

Public notice of application was published on November 22, 1997 and November 29, 1997 in the Skagit Herald to inform the public that an application had been submitted and to invite comment on the reissuance of this permit. This public notice was a part of the display add for the Skagit/Stillaguamish River watershed approach to permitting.

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

Water Quality Permit Coordinator
Department of Ecology
Northwest Regional Office
Bellevue, Washington 98008-5452

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

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

Further information may be obtained from the Department by telephone, (425) 649-7201, or by writing to the address listed above.
APPENDIX B--GLOSSARY

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

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

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

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

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

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

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

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

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

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

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

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.
Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a
Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all
parameters with limits in the permit to ascertain compliance with those limits; and, for
municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal
requirement. Additional sampling may be conducted.

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

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

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

Daily Maximum Discharge Limitation--The greatest allowable value for any calendar day.

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

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

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

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

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

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer
through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the
addition of rainfall-caused surface water drainage from roof drains, yard drains, basement
drains, street catch basins, etc., into a sewer.
FACT SHEET FOR NPDES PERMIT WA002025-7
CITY OF ANACORTES

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

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

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

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

Monthly Average --The average of the measured values obtained over a calendar month's time.

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

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

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

Significant Industrial User (SIU)--Industrial dischargers to a POTW that have effluent limitations defined in a category (40 CFR 403.6 and 40 CFR chapter I, subchapter N). However, the control authority may make a determination that even though an industrial user belongs to a category that has effluent limits for pretreatment, that industry is not a SIU because there is no reasonable potential for affecting the POTW's operation. A SIU may also be any other industrial user that: 1. discharges an average of 25,000 gallons per day or more of process water, 2. makes up more than 5 percent of the average hydraulic flow (dry weather) or 5 percent of the organic capacity of the plant, or 3. the control authority believes has a reasonable potential to adversely affect the POTW's operation.

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

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

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.
FACT SHEET FOR NPDES PERMIT WA002025-7
CITY OF ANACORTES

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

Upset—An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

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

**Last revision date:** 7/97  
**FILENAME:** ANACORTES 98  
**FACILITY:** RUN DATE: 2-27-98  
**PREPARED BY:** DAVID WRIGHT  
**WATER QUALITY CRITERIA**  
(in ug/L unless otherwise noted)

<table>
<thead>
<tr>
<th>Pollutant &amp; CAS No.</th>
<th>Pollutant ?</th>
<th>Carcinogen ?</th>
<th>Priority</th>
<th>Marine water quality criteria</th>
<th>Metal translators</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Acute</td>
<td>Chronic</td>
</tr>
<tr>
<td>AMMONIA</td>
<td>N</td>
<td>N</td>
<td></td>
<td>12.33</td>
<td>1.89</td>
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<tr>
<td>CHLORINE</td>
<td>N</td>
<td>N</td>
<td></td>
<td>13</td>
<td>7.50</td>
</tr>
<tr>
<td>CADMIUM - 7440439</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>42.00</td>
<td>9.3</td>
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<tr>
<td>4M</td>
<td></td>
<td></td>
<td></td>
<td>WAC 173-201A</td>
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</tr>
<tr>
<td>COPPER - 744058</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>4.80</td>
<td>3.10</td>
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<td>WAC 173-201A</td>
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<td>LEAD - 7439921</td>
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<tr>
<td>7M</td>
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<tr>
<td>MERCURY 7439976</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>1.80</td>
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<td>8M</td>
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<td></td>
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<td>WAC 173-201A, NTR - HH</td>
<td>0.15</td>
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### REASONABLE POTENTIAL CALCULATIONS

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<tr>
<th>State Water Quality Standard</th>
<th>Max concentration at edge of mixing zone (ug/L)</th>
<th>Acute</th>
<th>Chronic</th>
<th>Acute</th>
<th>Chronic</th>
<th>Acute</th>
<th>Chronic</th>
<th>Chronic</th>
<th>Acute</th>
<th>Chronic</th>
<th>Chronic</th>
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<tbody>
<tr>
<td>Ammonia</td>
<td>12740</td>
<td>1910</td>
<td>39.90</td>
<td>15.27</td>
<td>NO</td>
<td>0.95</td>
<td>1240</td>
<td>0.6</td>
<td>0.55</td>
<td>59</td>
<td>1.00</td>
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<tr>
<td>Chlorine</td>
<td>13</td>
<td>7.5</td>
<td>20.59</td>
<td>7.68</td>
<td>YES</td>
<td>0.95</td>
<td>640</td>
<td>0.6</td>
<td>0.55</td>
<td>59</td>
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</tr>
<tr>
<td>Copper</td>
<td>4.2</td>
<td>3.1</td>
<td>1.58</td>
<td>0.61</td>
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<td>0.95</td>
<td>36</td>
<td>0.6</td>
<td>0.55</td>
<td>20</td>
<td>1.36</td>
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<tr>
<td>Mercury</td>
<td>1.8</td>
<td>0.265</td>
<td>0.02</td>
<td>0.01</td>
<td>NO</td>
<td>0.95</td>
<td>0.50</td>
<td>0.8</td>
<td>0.55</td>
<td>20</td>
<td>1.36</td>
</tr>
<tr>
<td>Zinc</td>
<td>10</td>
<td>1.8</td>
<td>5.36</td>
<td>3.20</td>
<td>NO</td>
<td>0.95</td>
<td>190</td>
<td>0.5</td>
<td>0.55</td>
<td>20</td>
<td>1.36</td>
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</table>
WATER QUALITY-BASED EFFLUENT LIMITS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>DF_a</th>
<th>DF_b</th>
<th>Water Quality Standard Acute ug/L</th>
<th>Water Quality Standard Chronic ug/L</th>
<th>Average Monthly Limit (AML) ug/L</th>
<th>Maximum Daily Limit (MDL) ug/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHLORINE</td>
<td>31</td>
<td>81</td>
<td>13.0000</td>
<td>7.5000</td>
<td>153.9</td>
<td>403.0</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations</th>
<th>Statistical variables for permit limit calculation</th>
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</thead>
<tbody>
<tr>
<td>WLA Acute</td>
<td>WLA Chronic</td>
</tr>
<tr>
<td>ug/L</td>
<td>ug/L</td>
</tr>
<tr>
<td>403</td>
<td>607.50</td>
</tr>
</tbody>
</table>
APPENDIX D--RESPONSE TO COMMENTS
January 2, 2008

Ms. Judy Grosvenor  
Shelter Bay Community, Inc.  
1000 Shoshone Drive  
La Conner, WA 98257

RE: Long Term Treatment of Shelter Bay’s Biosolids

Dear Ms. Grosvenor:

I spoke with Marietta Sharp of the Department of Ecology regarding accepting Shelter Bay’s biosolids on a long term basis.

I am happy to say we can accept the biosolids as long as you need our services. We are requesting the following:

- That you continue to notify us when delivering biosolids.
- Submit your testing schedule and results, the same reports you would normally submit to the DOE, so that we may have that information at hand.

With regards to the rate/fee charged for treatment of the biosolids, we will continue to use current formula of $669 per dry ton.

If you have any questions or concerns, please feel to give me a call.

Sincerely,

John Franz  
Plant Manager
Hi Judy,

We have reviewed our numbers for 2009 and run our calculation to determine your fee and I have good news. Your cost to process Shelter Bay's sewage by Dry Tonnage has gone down.

2009 Cost - $807 per dry ton
2010 Cost - $759 per dry ton

I am working on the January billing which will reflect the new fee.

Sylvia Cooper
Department Secretary
COA - WWTP
360-299-0953
360-299-9296 Fax
Good Morning Dave,

I am copying Becky Fox, our new plant manager, who has been involved in the process since the beginning. She would be the person to ask about how the rates are arrived. Below is a history of your rates:

- $511 Per Dry Ton plus 30% Overhead = $669 per dry ton (2007)
- $592 Per Dry Ton plus 30% Overhead = $770 per dry ton (2008)
- $621 Per Dry Ton plus 30% Overhead = $807 per dry ton (2009)
- $583.85 Per Dry Ton plus 30% Overhead = $759 per dry ton (2010)
- $667.00 Per Dry Ton plus 30% Overhead = $867 per dry ton (2011)
- $570 Per Dry Ton plus 30% Overhead = $741 per dry ton (2012)
- $587 Per Dry Ton plus 30% Overhead = $763 per dry ton (2013)
- $696 Per Dry Ton plus 30% Overhead = $904.80 per dry ton (2014)
- $547 Per Dry Ton plus 30% Overhead = $711.10 per dry ton (2015)

Sylvia Cooper
Department Secretary
Anacortes Wastewater Treatment Plant
360-299-0963

From: David Franklin [mailto:manager@shelterbay.net]  
Sent: Tuesday, February 10, 2015 4:52 PM  
To: Cooper, Sylvia  
Subject: RE: Dry Tonnage Charge
Hi Sylvia,

We always like it when costs go down. Do you have any idea how $711.10 relates to rates in the past? I'm putting the budget together right now and I don't have a lot of history at Shelter Bay. Any help would be appreciated.

Thank you for the notice and have a good evening.

David Franklin
Shelter Bay Community, Inc.
Community Manager
1000 Shoshone Dr.
La Conner, WA. 98257

From: Cooper, Sylvia [mailto:sylvia@cityofanacortes.org]
Sent: Tuesday, February 10, 2015 4:49 PM
To: Dave Franklin (manager@shelterbay.net)
Subject: Dry Tonnage Charge

Hello Dave,

We have recalculated the charge per dry ton and the price has gone down. Your current cost per dry ton is $711.10.

Sylvia Cooper | Anacortes Public Works Department WWTP | P.O. Box 547 | 500 T Avenue | Anacortes, WA 98221
360.299.0953 (work) | 360.661.3523 (mobile) | sylvia@cityofanacortes.org | www.cityofanacortes.org
Interlocal Agreement

Regarding

Process Water from Pier 2

Between

The Port of Anacortes
A municipal corporation of the State of Washington

And

The City of Anacortes
A Washington City
THIS AGREEMENT (the "Agreement"), dated this 7th day of April, 2011, is made pursuant to Ch. 39.34 RCW, by and between the PORT OF ANACORTES, a Washington municipal corporation (the "Port") and the CITY OF ANACORTES, a Washington city (the "City"). The Port and the City are collectively known as the "Parties").

WHEREAS, the Port operates and for the past 80 years has operated one of only eight deep water marine terminals in Puget Sound known as "Pier 2".

WHEREAS, over the years a wide variety of cargo has been shipped across Pier 2, including logs, petroleum coke, and sulfur. These historical uses have varied in intensity over the years and in recent years have declined with the cessation of log shipments.

WHEREAS, in 1983 the City issued a shoreline substantial development permit for the construction of a mechanized conveyor loading system at Pier 2 which is designed to provide increased efficiencies for loading bulk cargos such as petroleum coke and prilled sulfur.

WHEREAS, the City operates and maintains the Waste Water Treatment Facility for the City of Anacortes.

WHEREAS, the Port proposes to discharge process water from Pier 2 to the City of Anacortes Waste Water Treatment Facility.

WHEREAS, the City currently has an easement in the location of the proposed storm water management facility, and this easement is for the purpose of constructing, maintaining, replacing or repairing the sole effluent discharge line for the Waste Water Treatment Facility.

NOW THEREFORE, for and in consideration of the mutual terms and conditions contained herein, the City and the Port hereby agree as follows:

Storm and Process Water from Pier 2. In order to preserve and enhance the economic viability of Pier 2, the City agrees to allow the Port to discharge its storm water and process water from Pier 2 to the City’s Waste Water Treatment Facility.

1.1. The Port will pay the City a General Facilities Charge of $639,349.00, payable in equal annual installments over a 10 year period, consistent with Anacortes Municipal Code Section 13.12.010, at 6% interest computed annually on the unpaid balance; payable by June 1 of each year, and can be paid off at any payment date. The General Facility Charge payment shall be due at the time of system start up after construction of the enlarged detention pond and connection to the Waste Water Treatment Facility.

1.2. The General Facilities Charge is based on the Port’s proposed purchase of 100.8 ERU for the drainage area and a credit for the 2005 purchase of 10.7 ERU for the drainage area. Therefore the GFC is based on an ERU of 90.1.
1.3. The General Facilities Charge is based on best available information regarding area, approximate rainfall in inches, and an average daily discharge flow of 19,438 gallons. If volume monitoring by the City indicates quantities greater than those described, the City will automatically impose the following discharge penalties.

1.4. Penalties for exceeding the limit on volume shall be based on the total volume of process water generated per calendar year. If the total volume of process water generated during a calendar year exceeds the annual limit, a fifty percent surcharge on the sewer rate shall apply. The surcharge shall apply only to the quantity of process water that exceeded the limit. The surcharge shall not apply to the entire annual volume of process water generated.

1.5. At any time after the calendar year 2017 the volume of the Port’s process water waste stream increases to more than 15% greater than the limits described in this agreement, the Port shall purchase additional ERU as require by Anacortes Municipal Code Section 13.08.020 F 15 or any amendment thereto.

1.6. The Port will pay the City the volume-based monthly discharge fee normally charged to similar dischargers in the City consistent with Anacortes Municipal Code Section 13.08.020 based upon SIC #1. The City shall test waste strength of the discharge water to verify the SIC #1 strength and the Port shall pay the appropriate monthly charge based upon established City rates.

1.7. The Port agrees that this facility is constructed at its own risk due to the existing location of the sole Waste Water Treatment Facility effluent outfall.

1.8. Timing. The Port shall move diligently to design and construct the necessary storage, pumping, metering and piping systems necessary to discharge the Pier 2 water to the City’s Waste Water Treatment Facility. Telemetry and controls required by the City shall be designed by a registered engineer, reviewed and approved by the City, installed by the Port and inspected by the City for acceptance. The City shall have direct control of the discharge pumping rate at the Waste Water Treatment Facility. Ownership and maintenance of the process water facility and appurtenances shall be the responsibility of the Port. The City shall have access to the pump facility for periodic inspection and monitoring. Upon Department of Ecology approval, system start-up, and connection to the Waste Water Treatment Facility, the Port will terminate its Pier 2 Industrial Stormwater General Permits and will discharge process water to the City of Anacortes under a separate Stormwater Permit.

1.9. Quality of Water. The water shall meet the standards set forth by the City and the Washington State Department of Ecology for acceptance of water to its Waste Water Treatment Facility. Prior to the addition of any new bulk cargo for shipment across Pier 2 the Port shall initiate a meeting with the City to discuss impacts, if any, to water quality and the appropriate means and methods to mitigate those impacts.

1.10. Temporary Discontinuance of Discharge to City Waste Water Treatment Facility. The City may, during a significant storm event, or during an emergency operation that
limits the hydraulic capacity of the Waste Water Treatment Facility, without notice, stop all discharge from Pier 2. The stoppage shall occur automatically without operator intervention at the Waste Water Treatment Facility or at Pier 2. When the condition that caused the stoppage has passed, any stored process water or stormwater may be discharged to the Waste Water Treatment Facility for treatment, subject to the conditions of this agreement. The City reserves the right to temporarily discontinue the Port discharge to the Waste Water Treatment Facility and will provide advance notice to the Port if possible. The City may temporarily discontinue the Port discharge to prevent a violation of the City discharge permit either from a capacity or consistency reason.

Administration and Notice. The following individuals are designated as representatives of the respective parties. The representatives shall be responsible for administration of this Agreement and for coordinating and monitoring performance under this Agreement. In the event such representatives are changed, the party making the change shall notify the other party. All notices, demands, requests, consents and approvals which may, or are required to be given by any party to any other party hereunder, shall be in writing and shall be deemed to have been duly given if delivered personally, sent by facsimile, sent by a nationally recognized overnight delivery service, or if deposited in the United States mail and sent by registered or certified mail, return receipt requested, postage prepaid to:

Port of Anacortes: Port of Anacortes
ATTN: Robert W. Hyde, Executive Director
First and Commercial
Post Office Box 297
Anacortes, WA 98221

City of Anacortes: City of Anacortes
ATTN: Fred Buckenmeyer, Public Works Director
P.O. Box 547
Anacortes, WA 98221

or to such other address as the foregoing parties hereto may from time-to-time designate in writing and deliver in a like manner. All notices shall be deemed complete upon actual receipt or refusal to accept delivery. Facsimile transmission of any signed original document and retransmission of any signed facsimile transmission shall be the same as delivery of an original document.
2. Dispute Resolution. The Parties shall attempt to resolve all claims, disputes, and other matters in question, arising out of or related to this Agreement, first through informal discussions and then through formal written notification and cure, before resorting to mediation or arbitration.

3. Severability. In the event any term or condition of this Agreement or application thereof to any person or circumstances is held invalid, such invalidity shall not affect the enforceability of other terms, conditions or applications of this Agreement and the parties will reasonable cooperate to modify this Agreement to achieve the purposes set forth herein.

4. Term. This Agreement shall be effective when signed and notarized by the duly authorized governing bodies of the Port and the City and remain in full force and effect until modified or terminated by mutual agreement of the Parties.

5. Modifications. This Agreement may be amended and modified by a written agreement signed by the Parties, in the same manner as the signing of the original Agreement.

6. Waiver. No failure by the parties to insist upon the strict performance of any term or condition of this Agreement, or to exercise any right or remedy upon a breach thereof, shall constitute a waiver or breach of any other term or condition of this Agreement.

7. Governing Laws. This Agreement and the rights of the Parties hereto shall be governed by and construed in accordance with the laws of the State of Washington.

8. No Third Party Beneficiaries. This Agreement is intended to be enforceable only by the Port and the City. There are no third-party beneficiaries to this Agreement.

9. Entire Agreement. This Agreement contains all terms and conditions agreed upon by the parties. All items incorporated herein by reference are attached. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind either of the parties hereto.

10. City Indemnification. To the extent permitted by law, the City shall save, defend and hold the Port, its elected officials, employees and agents harmless from any claims, demands, fines or losses arising from any act or omission by the City, its elected officials, employees or agents related to the Pier 2 Stormwater Project. Without limiting the foregoing, the City shall save, defend, and hold the Port harmless from any claims, demands, damages or losses arising from a default by the City. In the case where the claim, demand, damage or loss of the Port is caused by the concurrent or joint negligence or intentional conduct of the City, its elected officials, employees or agents and the concurrent or joint negligence or intentional conduct of the Port, its elected officials, employees or agents then the responsibility for such claim, demand, damage or loss shall be apportioned on the basis of fault.

11. Port Indemnification. To the extent permitted by law, the Port shall save, defend and hold the City, its elected officials, employees and agents harmless from any claims, demands, fines or losses arising from any act or omission by the Port, its elected officials, employees or agents related to the Pier 2 Stormwater Project. Without limiting the foregoing, the Port shall
save, defend, and hold the City harmless from any claims, demands, damages or losses arising from a default by the Port. In the case where the claim, demand, damage or loss of the City is caused by the concurrent or joint negligence or intentional conduct of the City, its elected officials, employees or agents and the concurrent or joint negligence or intentional conduct of the Port, its elected officials, employees or agents then the responsibility for such claim, demand, damage or loss shall be apportioned on the basis of fault.

12. Execution. The persons signing below represent and warrant that they have the requisite authority to bind the Party on whose behalf they are signing.

IN WITNESS HEREOF, the Port and the City have caused this Agreement to be executed in their names and to be attested by their duly authorized officers this 7th day of April, 2011.

PORT OF ANACORTES

By: ____________________________

R. W. Hyde, Executive Director

Date: ____________________________

April 7, 2011

State of Washington )

County of Skagit  )

Signed and attested to before me on April 7th, 2011 by R.W. Hyde.

Notary Public

Julienne M. Lindsey

Print or type name My appointment expires 07-24-12
CITY OF ANACORTES

By: H. Dean Maxwell, Mayor

Date: ____________

State of Washington )
County of Skagit )

Signed and attested to before me on ___________, 2011 by H. Dean Maxwell.

Notary Public

[Stamp]

Print or type name
My appointment expires ___________

Attachments: A. Effluent Discharge Line Easement
B. Pier 2 Site Plan
INTERLOCAL AGREEMENT FOR MUTUAL AID AND COOPERATION OF SEWER JET TRUCK BETWEEN THE
CITY OF OAK HARBOR, WASHINGTON AND THE CITY OF ANACORTES, WASHINGTON

THIS AGREEMENT is made and entered into this 19th day of February, 2013, by and between the CITY OF OAK HARBOR, WASHINGTON, a municipal corporation, hereinafter referred to as "Oak Harbor", and the CITY OF ANACORTES, WASHINGTON, a municipal corporation, hereinafter referred to as "Anacortes".

WINESSETH:

WHEREAS, Anacortes desires to rent a sewer jet truck, also referred to as the Vactor, from Oak Harbor in case of an emergency; and

WHEREAS, Oak Harbor desires to rent a sewer jet truck, also referred to as the Vactor, from Anacortes in case of an emergency; and

WHEREAS, the Interlocal Cooperation Act, as amended and codified in Chapter 39.34 RCW provides for interlocal cooperation between government agencies.

NOW, THEREFORE, in consideration of the mutual agreements and covenants herein contained, the parties agree as follows:

Purpose: The purpose of this agreement is to establish mutual aid and cooperation in allowing both Oak Harbor and Anacortes to utilize one another's Vactor trucks in case of an emergency.

Responsibilities of Oak Harbor: Oak Harbor shall have the following duties and responsibilities under this Agreement:

1. Oak Harbor shall provide a Sewer Jet truck with an operator for use by Anacortes, at the discretion of the City of Oak Harbor's Public Works Director, and shall be allowed only if such rental does not interrupt or interfere with Oak Harbor's regularly scheduled or emergency sanitary sewer or storm sewer maintenance activities.
2. Oak Harbor shall provide the Vactor fully fueled and ready to operate by a certified operator who will also transport the Vactor to the designated Anacortes facility.
3. Oak Harbor shall be responsible for all maintenance of their Vactor.
4. Oak Harbor shall invoice Anacortes for the use of the Vactor on a monthly basis.
5. Oak Harbor shall provide a location for Anacortes to decant and empty debris collected while doing work in Oak Harbor.
6. Oak Harbor shall provide a location to fill up Anacortes' Vactor with clean water, at no charge, for the operation of Anacortes' Vactor in Oak Harbor.
Responsibilities of Anacortes: Anacortes shall have the following duties and responsibilities under this Agreement:

1. Anacortes shall provide a Sewer Jet truck with an operator for use by Oak Harbor, at the discretion of the Public Works Director, and shall be allowed only if such rental does not interrupt or interfere with Anacortes' regularly scheduled or emergency sanitary sewer or storm sewer maintenance activities.
2. Anacortes shall provide the Vactor fully fueled and ready to operate by a certified operator who will also transport the Vactor to the designated Oak Harbor facility.
3. Anacortes shall be responsible for all maintenance of their Vactor.
4. Anacortes shall invoice Oak Harbor for the use of the Vactor on a monthly basis.
5. Anacortes shall provide a location for Oak Harbor to decant and empty debris collected while doing work in Anacortes.
6. Anacortes shall provide a location to fill up Oak Harbor's Vactor with clean water, at no charge, for the operation of Oak Harbor's Vactor in Anacortes.

Representation, Warranties, and Indemnities:

A. Oak Harbor represents and warrants to Anacortes that it has authority to enter into this Interlocal Agreement pursuant to RCW 39.34.030(2).
B. Anacortes represents and warrants to Oak Harbor that it has authority to enter into this Interlocal Agreement pursuant to RCW 39.34.030(2).
C. It is understood and agreed between the parties hereto that both Oak Harbor and Anacortes agree to protect, defend, indemnify and hold harmless one another, its council, agents, departments and employees against any and all liabilities, claims, damages, penalties, actions, costs, and expenses (including reasonable attorney's fees) which may arise for any reason as a result of the performance of the Agreement by either party.

Duration of Agreement. This agreement will not expire unless terminated by either party.

Termination of Agreement. Either party may terminate this Agreement, by providing written notice to the designated contact for each party identified in the "Notices" section of this Agreement. This written notice must be served on the other party within thirty days (30) of the date of termination.

Partial Invalidity. Whenever possible, each provision of this Agreement shall be interpreted in such a manner as to be effective and valid under applicable law. Any provisions of this Agreement, which shall prove to be invalid, void, or illegal, shall in no way affect, impair, or invalidate any other provisions herein, and such other provisions shall remain in full force and effect.

No Third-Party Rights. Except as expressly provided herein, nothing in this Agreement shall be construed to permit anyone other than the parties hereto and their successors and assigns to rely upon the covenants and agreements herein not to give any such third party a cause of action (as a third-party beneficiary or otherwise) on account of nonperformance hereunder.
Assignability. The rights, duties, and other obligations of either party to this Agreement may not be assigned to any third party without the prior written consent of the other party, which consent shall not be unreasonably withheld.

Interlocal Cooperation Act. No special budget or funds are anticipated, nor shall be created. It is not intended that a separate legal entity be established to conduct this cooperative undertaking, nor is the acquisition, holding, or disposing of real or personal property other than as specifically provided within the terms of this Agreement anticipated. Oak Harbor shall be designated as the Administrator of this Interlocal Agreement.

Entire Agreement. This Agreement and any amendments thereto mutually agreed to by the parties, constitutes the entire Agreement between the parties hereto and no other agreements, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or bind any of the parties. Either party may request changes to the Agreement. Proposed changes that are mutually agreed upon shall be incorporated by written amendment hereto.

Insurance. Each party shall maintain in effect insurance with limits in the amount each entity currently has in place.

Dispute Resolution. It is the parties’ intent to resolve any disputes relating to the interpretation or application of this Agreement informally through discussions at the staff level. In the event disputes cannot be resolved informally at the staff level, then the parties agree to first submit the dispute to non-binding mediation/dispute resolution before resorting to litigation.

Litigation. In the event that any suit or action is instituted by either party to enforce compliance with or interpret any of the terms, covenants, or conditions of this Agreement, the prevailing party shall be entitled to collect, in addition to necessary court costs, such sums as the court may adjudge as reasonable attorney fees. The venue for any action to enforce and interpret this Agreement shall lie in the Superior Court for Island County, Washington.

Notices. All notices and demands shall be in writing and sent to the parties hereto at their address as follows:

To Oak Harbor:
Cathy Rosen
Public Works Director
865 SE Barrington Drive
Oak Harbor, WA 98277

To Anacortes:
Fred Buckenmeier
Public Works Director
PO Box 547
Anacortes WA 98221
Filing of Agreement. Executed copies of this agreement shall be filed as required by Section 39.34.040 of the Revised Code of Washington prior to this agreement becoming effective.

Evidence of Authority. Upon execution of this Agreement, Oak Harbor shall provide Anacortes and Anacortes shall provide Oak Harbor with a copy of the resolution, ordinance, or other authority given to execute this Agreement pursuant to RCW 39.34.030(2), and said document with be attached hereto and incorporated herein as Exhibit “A” (Oak Harbor) and Exhibit “B” (Anacortes).

IN WITNESS WHEREOF said parties have caused this Agreement to be signed by the duly authorized officials on the day and year first above written.

ENTERED this day of , 2013.

CITY OF OAK HARBOR

[Signature]
Mayor

ATTEST:

[Signature]
City Clerk

APPROVED AS TO FORM:

[Signature]
City Attorney

CITY OF ANACORTES

[Signature]
Mayor

ATTEST:

[Signature]
City Clerk

APPROVED AS TO FORM:

[Signature]
City Attorney
APPENDIX H
Padilla Heights Sanitary Sewer Plan
and
Cost Estimate

Prepared By:
City of Anacortes-Engineering Department
June 2008
Background

To facilitate the annexation of properties currently in the City of Anacortes Urban Growth Area (UGA) into the Anacortes city limits, it is necessary for sanitary sewer service to be extended to support development. The completion of a sanitary sewer project in 2007 in the vicinity of Molly Lane extended sewer service to the eastern border of the city limits. Sewer service can be extended from the line installed during this project to serve the extent of the UGA. This preliminary report includes conceptual design and planning using estimated sewer loads and current zoning. This report was generated to provide an estimate of the cost associated with extending sewer service into the UGA located at the eastern extent of Anacortes city limits.

Service Area Description

The UGA referred to in this plan consists of two separate UGA areas totaling 187 acres. The first is generally made up of the properties adjacent to Padilla Heights Road, consisting of approximately 162 acres, and bordered by SR20 to the north and Reservation Road to the west, as can be seen in Figure 1. The second portion of UGA is a patch of approximately 25 acres sited between Stevenson Road to the north, and Similk Bay Road to the south. Consequent to extending sewer service to these UGA’s, service will also be available to the parcels located to the south and west of Padilla Heights Road, and bordered by Reservation Road to the west. Topographically, the area has a high point of approximately 150’ at the crest of Padilla Heights Road and descends to nearly sea level to the south along Reservation Road.

Land Use

All areas discussed in this plan are zoned Light Manufacturing (LM1). The City’s zoning ordinance states that LM1 is intended primarily to accommodate industrial type uses that do not need water access or proximity to the central business district or to the Commercial Avenue corridor. Current land use as seen in Table 1 is comprised mainly of open space. The approximately 35 acres of miscellaneous services represents the current use most congruent with the LM1 zoning, it consists of business parks, office space, and distribution centers.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN SPACE, FARM AND AG.</td>
<td>51.68</td>
</tr>
<tr>
<td>HOUSEHOLD SFR OUTSIDE CITY</td>
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<tr>
<td>MISCELLANEOUS SERVICES</td>
<td>35.18</td>
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<tr>
<td>LAND ZONED INDUSTRIAL WITH RESIDENCE</td>
<td>22.74</td>
</tr>
<tr>
<td>WHOLESALE TRADE</td>
<td>13.92</td>
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<tr>
<td>TREES</td>
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<td>UNIMPROVED LAND</td>
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<td>RETAIL/AUTO/TIRES/MARINECRAFT/AIRCRAFT &amp; ACCESS.</td>
<td>1.12</td>
</tr>
<tr>
<td>MOBILE HOMES</td>
<td>1.11</td>
</tr>
<tr>
<td>REPAIR SERVICES</td>
<td>0.91</td>
</tr>
</tbody>
</table>

Table 1
**Existing System**

Currently there is no sewer service available in this portion of the UGA. The nearest existing sewer service is located on Reservation Road. Figure 3 shows a 10-inch PVC line flowing north from manhole W-086 and crosses SR20. It is this section of line that the Padilla Heights Road proposed gravity sewer would connect to, as well as the Reservation Road force main serving sub-basins 3 & 4.

**Proposed Improvements**

The proposed sewer extension consists of four sub-basins. Sub-basins 1 & 2 are the Padilla Heights Road sewer line, and sub-basins 3 & 4 are the Similk Bay Rd./Reservation Rd. sewer line. Lower elevations exist and thus require pump stations to force sewer loads back to the gravity line. Pump station locations can be seen in Figure 3. Proposed gravity lines are 8-inch diameter PVC, this size allows for the pipe to be less than 50% capacity at peak flow as required by City of Anacortes engineering standards. The force main line for sub-basin 1, from the pump station at the east end of Padilla Heights Rd. to manhole PH-08 is proposed to be 8-inches in diameter; force main size for sub-basin 3 from the pump station at the south end of Reservation Road to existing manhole W-086 is 4-inch diameter PVC. Force main diameters are sized to maintain a self-cleaning velocity of 3.0 feet per second.

**Flow Analysis**

Loads have been estimated to calculate the flow if development were to occur based on the current LM1 zoning. Using data from the Skagit County Population & Employment Allocation Final Report (2003), it is estimated that build-out in this zoning would result in approximately 6.5 employees per acre. It was assumed that each employee would contribute 50 gallons per day of wastewater to the system. A peaking factor of 400% was applied to each estimated load.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<td>0.03</td>
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<td>0.044</td>
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<tr>
<td>Similk Bay Road Sub-Basin 4</td>
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<td>0.015</td>
<td>0.008</td>
<td>5.5</td>
<td>0.03</td>
<td>22</td>
<td>1.98</td>
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</table>

*Table 2*
Using Manning’s equation, estimated flows and velocities were determined. The calculated daily flows shown in Table 2 are all well below the recommended 50% pipe capacity threshold. The calculated velocities are sufficient for self-cleaning with the exception of the Similk Bay Road segment which is slightly lower than the 2.0 feet per second as recommended by City of Anacortes engineering standards. It is likely that the Similk Bay Road segment would require more frequent cleaning to prevent accumulation of solids.

Improvement Descriptions

Sub-basin 1(Figure 4) would consist of approximately 2743 feet of 8-inch PVC sewer line. Beginning at the crest of Padilla Heights Road (proposed manhole PH-01) and running east to the proposed pump station in the vicinity of the intersection of Padilla Heights Road and SR20. Sewage would then be forced back up the hill parallel to the gravity line in an 8-inch PVC force main. The force main would terminate at the beginning manhole (PH-08) of sub-basin 2.

Sub-basin 2(Figure 5) will also be an 8-inch PVC line approximately 2284 feet in length. Beginning at manhole PH-08 it will flow north on Padilla Heights Road, then west to Reservation Road. It will connect with existing sewer on Reservation Road at manhole W-065 which is part of the 10-inch PVC sewer line which flow north across SR20.

Sub-basin 3(Figure 6) will collect sewage from the parcels adjacent to Reservation Road and between Stevenson Road to the north and Similk Bay Road to the south. Beginning at manhole RR-01 and flowing south 1327 feet to the proposed pump station near the intersection of Similk Bay Rd. and Reservation Rd. Loads will then be forced parallel to the gravity line and connect approximately 2365 feet north at existing manhole W-086.

Sub-basin 4(Figure 6) collects sewage from properties along Similk Bay Road. Using 8-inch PVC it will begin at proposed manhole SB-01 and flow 800 feet to the east and into the proposed pump station. From the pump station it will be forced north on Reservation Road along with the loads collected from sub-basin 3.

Cost Estimates

Costs were determined using recently completed projects as reference. The estimate does not include any costs for property acquisition as it is assumed that with annexation property will be available for pump station locations. The estimates are in 2008 dollars, future costs have been estimated using a 5% annual inflation rate and applied over the next five years.
Padilla Heights Road Sanitary Sewer Line (sub-basins 1 & 2; see Figures 4 & 5)

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Spec. Sec.</th>
<th>Qty.</th>
<th>Unit</th>
<th>Price</th>
<th>Cost</th>
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<tr>
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CONSTRUCTION COST $1,662,900.00

Traffic Control (5% of construction cost)

Mobilization (8% of construction cost)

Design (10% of construction cost)

Contingencies (15% of construction cost)

SUB-TOTAL $2,294,700.00

Tax (8%)

TOTAL COST (2008 Dollars) $2,478,300.00

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<tr>
<td>2013</td>
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Padilla Heights Sanitary Sewer Plan & Cost Estimate  
June 2008
**Reservation Road/Similk Bay Road (sub-basins 3 & 4; see Figure 6)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Spec.Sec.</th>
<th>Qty.</th>
<th>Unit</th>
<th>Price</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Minor Changes</td>
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<td>EA</td>
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<td>PVC Sanitary Sewer Pipe 8 In. Diam.</td>
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<td>LF</td>
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</table>

**CONSTRUCTION COST**

- Traffic Control (5% of construction cost) $44,200.00
- Mobilization (8% of construction cost) $70,800.00
- Design (10% of construction cost) $88,500.00
- Contingencies (15% of construction cost) $132,700.00

**SUB-TOTAL** $1,221,000.00

**Tax (8%)** $97,700.00

**TOTAL COST (2008 Dollars)** $1,318,700.00

- 2009 $1,384,600.00
- 2010 $1,453,800.00

Cost in subsequent years (5% inflation/yr)

- 2011 $1,526,500.00
- 2012 $1,602,800.00
- 2013 $1,682,940.00

---

*Padilla Heights Sanitary Sewer Plan & Cost Estimate*
*June 2008*
FIGURE 1

CITY LIMIT
PARCELS
LM1-Light Manufacturing
OSA

URBAN GROWTH AREA

PADILLA HEIGHTS SANITARY SEWER
- Area Overview -

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