CITY OF SEDRO-WOOLLEY
COMPREHENSIVE SEWER SYSTEM PLAN
EXECUTIVE SUMMARY

This Comprehensive Sewer System Plan is the compilation of results and findings of recent planning and engineering analyses completed for the City of Sedro-Woolley. The purpose of the analyses was to assess the ability of the existing sanitary sewer and treatment systems to accommodate the wastewater flows from the existing and projected population of the City. The Plan updates and supercedes the City's previous Comprehensive Sewer System Plan and has been prepared in accordance with all applicable statutes and guidelines. It has been prepared by Penhallegon Associates Consulting Engineers, Inc. with the financial aspects of the Plan being completed by Katy Isaksen and Associates.

The City of Sedro-Woolley's sewer service area is approximately 5.7 square miles and is consistent with the existing Urban Growth Area (UGA) Boundary. The service area extends from just north of the Northern State Multi-Service Center on the north to the Skagit River to the south, and from just east of Helmick Road on the east to Collins Road on the west. The City currently provides sanitary sewer collection and wastewater treatment services to approximately 3,030 direct service connections, most of which are within the existing City limits.

The primary purpose of this planning process was to develop a document which establishes a program for future improvements to and expansion of the City of Sedro-Woolley's sanitary sewer system. Insofar as possible, this was achieved using previous plans, studies and other documentation accomplished by the City and other City consultants. The planning process included incorporation of available computerized GIS mapping from Skagit County and the City's GIS mapping database.

Analysis of the collection and treatment systems required development of population projections for the service area and are put forth in Section 2 of the Plan. Although significant increases are not expected over the six year life of the Plan, there is significant development potential recognized and proposed within the service area for the twenty year planning horizon. Although there are currently (year 2002) approximately 8,805 residents of the City, sanitary sewer service is provided to an estimated population 7,265. The number of residents receiving sanitary sewer service is expected to increase to nearly 15,755 residents by build-out (year 2025).

Determination of the ability of existing facilities to meet the needs of the current and future populations of the City is a primary objective of the planning process and has been accomplished for both the collection and treatment systems. Analysis of the collection system was accomplished using a combination of practical knowledge and engineering, information provided by City staff, and through the use of a computer model constructed as part of this

project. The model was constructed using state-of-the-art Hydragraphics software, and includes all of the City's pump stations, trunk lines over 6-inches in diameter and other collection facilities which were either determined to be critical in the overall system or were suspected of having capacity issues.

The results of the collection system analysis are presented in Section 6 of the Plan. Under existing flow conditions, several areas were identified where pipe upgrades are required to correct specific deficiencies such as line sags, flow constrictions, capacity limitations and flow issues associated with pipe grades. Similar analyses were performed for future flow conditions, and as expected, additional areas of potential capacity problems were identified.

Infiltration and inflow was identified as a primary concern in the existing and future operation of the system. Many of the identified capacity issues can be mitigated through reduction of I & I into the system. An aggressive I & I program, which includes flow monitoring, pipeline video inspection and smoke testing, as necessary, is recommended. Initial work in the program should target areas that have historically experienced high flows during wet weather conditions.

Other recommended collection system improvements include routine rehabilitation of pump stations, an annual pieline renewal and replacement program, a grease program, and telemetry improvements. In addition, this Comprehensive Plan contemplates extension of sewers into currently undeveloped and/or unsewered areas. It is expected, however, that the extension of sewer service will be accomplished as required by development within the service area or as requested by existing properties which are currently served by on-site disposal systems.

The City's Wastewater Treatment Plant is responsible for treating all flows generated by the City's sanitary sewer customers. The treatment plant discharges to the Skagit River via a 24-inch outfall. The treatment plant was originally constructed in 1956 and has undergone upgrades in 1973, 1994 and 1998. The most recent upgrade included improvements to the headworks, added digester capacity, UV disinfection, added sludge dewatering capacity, and added an anoxic tank for secondary treatment. The treatment plant consistently operates within the limits of its existing NPDES permit, which was updated after the 1998 treatment plant upgrades. The treatment plant is operating well and current recommendations are limited to operations issues. The City is also planning for water reuse as a means of reducing effluent discharge and promoting water conservation.

The Capital Improvements Plan identified in Section 9 identifies approximately $16,000,000 in collection system improvements and approximately $350,000 in treatment plant improvements through the six year life of this Plan (year 2010). An additional $2,125,000 in improvements is expected after 2010. Recommended funding options for the projects include bond financing, Public Works Trust Fund financing, rates, connection charges, developer financing, and existing budgeted funds.

SECTION 8 – TREATMENT PLANT ANALYSIS AND RECOMMENDATIONS

SECTION 9 – CAPITAL FACILITIES PLAN

SECTION 10 – FINANCIAL PLAN

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1.7 HISTORY OF THE CITY

The City of Sedro-Woolley was incorporated as a City on December 19, 1898. The incorporation was the result of the merger of the towns of Sedro and Woolley.

The original wastewater system in the City was installed in 1911 and consistent of vitrified clay pipe ranging in size from 8-inches to 18-inches. As the collection system grew, two main sewer interceptors were developed; the Third Street and Township Street Interceptors both bring wastewater south through the City to the wastewater treatment plant. Many of the extension to the main interceptors and trunk lines exceeded 8-inches in diameter while the side sewer extensions in the residential areas of the City were primarily 8-inches or smaller. Concrete pipe was used exclusively for system extensions until the mid 1970s. Starting in the late 1970s, the use of PVC pipe began and was used at the northern end of the City off Township. The Third Street Interceptor is as large as 30-inches in diameter and is the largest main in the system.

The City's wastewater treatment plant is located in the southern part of the City, just north of the Skagit River. The plant provides secondary treatment using conventional activated sludge consisting of an oxidation ditch with secondary clarifiers. Influent grit and screenings removal preceded the secondary treatment process and UV disinfection is provided prior to effluent discharge to the Skagit River via a 24-inch outfall. Byproduct waste generated by the treatment process, such as sludge, is stored in two digesters before being trucked off-site to be used in environmentally sound ways.

1.8 RULES AND REGULATIONS

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

1.8.1 Federal Requirements

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

1.8.1.1 Clean Water Act

The Clean Water Act puts forth regulations and requirements for restoration and maintenance of the integrity of the nations waters in terms of physical, chemical and biological characteristics. The U.S. Environmental Protection Agency (EPA) is the primary administrator of the Clean Water Act but has delegated many

aspects of administration of the Act to the State of Washington Department of Ecology (DOE), including: the National Pollution Discharge Elimination System (NPDES) permit program; Biosolids regulations (40 CFR 503); and Pretreatment Regulations (40 CFR 503). Additional discussion on NPDES permit for the City is presented later in this Section.

1.8.1.2 U.S. Army Corps of Engineers

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

1.8.1.3 Endangered Species Act

Because of the listing of the Puget Sound Chinook Salmon and Bull Trout as a "threatened species", rules and regulations under the authority of the Endangered Species Act (ESA) will effect collection sewer system and treatment plant operations. Because the City operates a wastewater treatment plant and is responsible for the disposal of treated effluent and waste, compliance issues relating to treatment and disposal are managed and enforced by the City in accordance with the "4d" rule.

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

1.8.1.4 Capacity, Management, Operations and Maintenance

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

1.8.2 State of Washington Requirements

The City of Sedro-Woolley operates its sewer system under the general rules and

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

1.8.2.1 Department of Ecology (DOE) Regulations

Approval of this document and operation of the sanitary sewer system is under the jurisdiction of the State Department of Ecology (DOE). This document has therefore been prepared, and the City is operated, in accordance with the requirements set forth in the DOE's "Criteria for Sewage Works Design" (December 1998), which incorporates the policies, guidelines and practices of the State Department of Ecology and identifies the minimum engineering requirements for design, construction and operation of a public sanitary sewer system.

The State Department of Ecology administers a variety of regulatory requirements which have a direct impact on operation of public sanitary sewer collection and treatment facilities including the following:

- Surface water quality regulations as put forth in WAC 173-201A
- National Pollutant Discharge Elimination System (NPDES) permit administration and enforcement as authorized in WAC 173-220 and 221.
- Contract document review as authorized by WAC 173-240.
- Shoreline management permit administration in accordance with WAC 173-27.

1.8.2.2 State Environmental Policy Act (SEPA)

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

1.8.2.3 Growth Management Act

The Growth Management Act (GMA) has a direct impact on utility system planning as it requires a complete inventory of existing facilities and a

comprehensive effort toward the capability of existing systems to accommodate future growth. This Plan has been developed consistent with County-wide and local Growth Management Act planning.

1.8.3 City Requirements

This Plan has been developed in accordance with a variety of plans, policies and regulations put forth by the City of Sedro-Woolley. A summary of the specific policies impacting sanitary sewer service are presented in Section 2 of this Plan.

1.9 RELATED PLANNING STUDIES

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

- **City of Sedro- Woolley Comprehensive Plan and Development Regulations, September 1998**. This document puts forth the plans and policies currently guiding City decisions on growth, land use, and public facilities and services.
- **City of Sedro-Woolley Public Works and Development Standards.** These are the City's current standards.
- **Comprehensive Wastewater Plan for City of Sedro-Woolley, June 1995, by Barrett Consulting Group.** This is the City's current planning document related to the sewer system.
- **Engineering Report for Wastewater Treatment Plan Upgrade, January 1996, by Brown and Caldwell.** This report documents the latest upgrades to the wastewater treatment plant.
- **Contract Documents for the Wastewater Treatment Plant Upgrade, March 1998, by Earthtech.** These documents further describe the latest upgrades to the wastewater treatment plant.

topographic features and other environmentally sensitive areas require special considerations when planning for and providing sanitary sewer service.

2.5.3 Natural Drainage Basins

The natural drainage basins delineated around Sedro-Woolley's existing City and UGA limits, as shown on Figure 2-2, were developed with topological influences in mind. To the south, southwest, and east of the City, the natural drainage basins are approximately the limits of the UGA, due to flat and undulating contours. The topology influences are more apparent to the north and northeast of the City limits, where the natural drainage basins extend far beyond the UGA.

2.5.4 Sanitary Sewer Collection Basins

Topography and drainage characteristics within the District create two primary Sanitary Sewer Collection Basins: the Third-Metcalf Street Basin and the Township Street Basin as shown on Figure 2-3. These basins were delineated during the sewer system planning process based on topography and existing system characteristics.

The Township Street Basin is in the northeastern portion of the City and extends from the wastewater treatment plant just north of the Skagit River to beyond the northern and eastern boundary of the City. The western boundary varies from approximately Sapp Road (along the current City limits) in the north to Township Street in the south. All flow from this basin travels to the wastewater treatment plant via the Township Street Interceptor. The potential area that could be served by this basin is approximately 2,200 acres. This basin is divided into seven sub-basins labeled Sub-Basins “A” through “G” and is discussed in detail in Sections 4 and 6.

The Third-Metcalf Street Basin is approximately 1,400 acres in size and covers the western portion of the service area, from approximately East Jones Road on the north to the wastewater treatment plant on the south. The City limits define the western basin boundary. Flows from this basin travel to the wastewater treatment plant via the Metcalf Street and Third Street Interceptors. This basin is divided into six sub-basins labeled Sub-Basins “M”, “N”, “P”, “R”, “S”, and “T”. Additional information on these sub-basins is provided in Sections 4 and 6.

Penhallegon Associates Consulting Engineers, Inc.

2005 COMPREHENSIVE SEWER SYSTEM PLAN

N
W E
S

0 500 1,000 2,000 Feet

Legend

- UGA
- CITY LIMITS

NAME

- Central Business District
- Industrial
- Mixed Commercial
- Open Space
- Public
- Residential 15
- Residential 5
- Residential 7

FIGURE 2-5

ZONING MAP

CITY OF SEDRO-WOOLLEY
GATEWAY TO THE NORTH CASCADES

Date: May 27, 2005
User Name: dand
Project: 03896.00
File Name: Fig 2-5.mxd

wastewater treatment facility is explained in greater detail in Sections 7 and 8 of this Plan.

4.3 SEWER COLLECTION BASINS

The City of Sedro-Woolley's sanitary sewer service area is divided into two primary sewer collection basins, which are referred to as the Third-Metcalf Street and Township Street Basins. For system analysis and reference, the two primary sewer collection basins have been further divided into 13 sub-basins. Sub-basins have been determined based upon ground topography, pump station flow directions, and direction of sewer gravity flow within each area. Primary sewer collection basins and sub-basins are indicated on Figure 4-2 and further described in Table 4-1. Sub-basins A, B, C, D, E, F and G are within the Township Street Basin and sub-basins M, N, P, R, S, and T are within the Third-Metcalf Street Basin. General basin characteristics are given below with approximate boundary descriptions. Please refer to Section 5 for additional detail regarding modeling and analyses of sub-basins.

4.3.1 Township Street Basin

The Township Street basin is considerably larger than the estimated 900 acres that are currently served by the City's existing sewer system and is sub-divided into 7 sub-basins serving the north, south, northeast and eastern sections of the City. More detailed information regarding specific sub-basin characteristics in the Township Street Basin is provided in Table 4-1 and the following paragraphs.

4.3.1.1 Sub-Basin A

Sub-basin A covers approximately 83 acres of single-family residential, public use, and open space land. The sub-basin is bounded by Fidalgo Street to the north, Third Street to the west, Township Street to the east, and the existing city limits to the south. Both the west and east basins drain into this sub-basin as it is the most down gradient sewer collection sub-basin. Sewer flows from the east basin are directed between Sterling Street and Fidalgo Street via an 18-inch diameter concrete sewer main to the wastewater treatment plant via Fourth Street.

4.3.1.2 Sub-Basin B

Sub-basin B covers approximately 219 acres of land and is bounded by the City's existing sewer service area boundary to the east, Township Street to the west, State Street to the north, and the City's sewer service area boundary to the south. Existing land use is comprised primarily of single-family residential development. This sub-basin receives flows from all upstream sub-basins in the Township Basin and directs sewage flow from the north to the south along Township Street via a 15-inch concrete sewer main, then heads westward to Sub-basin A. Manholes connected to the pipes were observed to be in good

4.3.2.1 Sub-Basin M

Sub-basin M is the largest basin within the City's existing western basin. It includes approximately 376 acres of the downtown area and is bounded by Township Street to the east, Rita and Metcalf to the west and Fidalgo Street to the south. Land use in the area is a mixture of commercial, residential and public facilities. The City's wastewater collector main is located within this basin and is called the Third Street Interceptor. Flows from the entire Third Street Basin are directed to the Third Street Interceptor located within Sub-basin M and flow south directly to the treatment plant. Field observations indicate that manholes in the area are in good working condition.

4.3.2.2 Sub-basin N

Sub-basin N covers the area approximately bounded by SR-20 to the north, Rhodes Road to the west, Jameson Street to the south, and Rita Street to the east. This sub-basin is directly to the east of Sub-basin T with upstream sewer collection flows coming from Sub-basins T and S. This Sub-basin delivers sewage directly into Sub-basin M trunk lines along SR-20 and West State Street. Sub-basin N is approximately 141 acres. The land uses in this area consist of single-family residential, commercial, and some agricultural uses. The commercial areas are generally located north of Sunset Park Drive and along West State Street. The West State Street Pump Station is located at the intersection of West State Street and Maple Street and pumps flows from Sub-basin N and its contributing upstream sub-basins.

4.3.2.3 Sub-basin P

Sub-basin P covers approximately 282 acres that are bounded by Birch Lane to the west, John Liner Road and East Jones Street to the north, West State Street and Northern Avenue to the south, and Ball Street to the east. This sub-basin is directly east of Sub-basin S and includes single-family residential, commercial, and some recreational open space land uses. Flows from this sub-basin are directed from north to south from North Murdock Street, then south along Metcalf Street to the intersection of State Street where the basin discharges downstream to Sub-basin M and the Third Street Interceptor. The 10-inch diameter vitrified clay pipe connection to the manholes in Northern Avenue and 14-inch diameter vitrified clay pipe connection to the manholes in Metcalf Street are believed to be in good condition.

4.3.2.4 Sub-basin R

Sub-basin R covers approximately 245 acres of mostly flat or slightly undulating

slopes. This area has historically used septic. A new pump station and force main along F&S Grade Road and Jones Street that flows to the Metcalf Interceptor will discharge additional flows into the City's west basin once construction is completed in 2005. Approximately 250 gpm will temporarily be discharged into the Third-Metcalf collection line until the sewer line has been upsized to al least 15-inched and renovated. The ultimate pump station capacity for the West Jones Street Pump Station will be approximately 890 gpm for this predominantly residential and commercial land use area.

4.3.2.5 Sub-basin S

Sub-basin S is generally located just east of and receives flows from Sub-basin T. Land use in this area is a mixture of single-family residential, commercial and a significant portion of the sub-basin is unsewered and/or served by private septic tanks. The approximate size of the sub-basin is 170 acres. Gravity service is achieved by the Cook Road Pump Station, located near the intersection of Cook Road and Prospect Street in the northwestern portion of the sub-basin, and an 8-inch PVC line along Cook Road flowing to a 10-inch diameter PVC sewer main on Trail Road. The sewer main connects to the SR-20 sewer trunk. Flows from Sub-basin S are directed to Sub-basin M.

4.3.2.6 Sub-basin T

Sub-basin T is generally located at the southwest region of the City's sewer service area. The basin is approximately 128 acres of mostly commercial land in the westernmost part of the City. The sub-basin is along the SR-20 corridor extending from the City limits at Collins Road on the west to Rhodes Road on the east. The majority of the sewer pipes within this sub-basin is reinforced concrete pipe. The manholes and pipe connections along SR-20 for the 8-inch diameter pipe is in good condition, according to the 2003-2004 manhole survey. Most of the slopes along the SR-20 line are flat and the Hodgins Road Pump Station pumps flows from Sub-basin T to Sub-basin S. Additional detail on the facilities serving this sub-basin including a detailed description of the Hodgins Road Pump Station is provided later in this Section. Additional pump stations will be required to serve Sub-basin T. The Holtcamp Station is proposed to be on line in 2005.

4.4 COLLECTION SYSTEM FACILITIES

Sedro-Woolley's existing sewer system consists of approximately 39 miles of sewer mains, approximately 0.67 miles of 24-inch outfall, and 5 pump stations, all of which discharge to the wastewater treatment plant that is described in Sections 7 and 8 of this Plan. There are currently approximately 3025 direct service connections on the Sedro-Woolley system further classified as 2,740 single-family, 45 multi-family, 240 commercial/public accounts.

Some of the City's most significant connections in terms of flows to the system include flow from Northern State Multi Service Center, flows from agricultural and commercial businesses, and schools.

4.4.1 Collection System

The majority of the City's collection system is smooth polyvinyl chloride (PVC) and reinforced concrete pipe (RCP) although existing facilities are comprised of a variety of materials including vitrified clay, ductile iron (DI), and asbestos cement (AC). Vitrified clay is common in the older parts of the City sewer system while the more recently developed areas contain PVC pipes. The collection system includes approximately 1.2 miles of force mains with pump stations in low lying areas. Table 4-2 presents the approximate lengths of different type and size pipes within the system. There are approximately 730 manholes within the City.

Table 4-2

City of Sedro-Woolley

Existing System Inventory (LF)

6" Gravity	10,999	20" Gravity	128
8" Gravity	125,974	24" Gravity	1,936
10" Gravity	26,160	24" Outfall	3,519
12" Gravity	13,188	30"	800
14" to 16" Gravity	9,400	Force Main	6,600*
18" Gravity	2,717	TOTAL PIPE	201,421

Notes: HDPE outer diameter versus inner diameter is different depending on different SDRs.
Sizes are nominal diameters.

* Force main length does not include new F&S Grade Pump Station lengths.

4.4.2 Pump Stations

Sedro-Woolley serves properties with gravity sewers whenever possible. However, since the majority of the central, western, southern, and eastern side of the City changes in elevation by less than 5 feet, some areas of the service area are too low in elevation or too flat to be served by gravity sewers. Sewer pump stations (or lift stations) have been constructed to transport the flows from these areas. The majority of the pump stations are located at the lowest point in the area to be served and pump sewage flows toward the City wastewater treatment plant. Most of these pump stations have been recently upgraded.

All of the pump stations in the system are submersible stations with the exception of the John Liner and Klinger Pump Stations. In a submersible station, pumps specially designed for submersion in liquid are placed directly in the wet well and the sewage is pumped through a force main to the discharge location.

A brief description of each station (existing and 2004 installations) in the system is given below and summarized in Table 4-3.

4.4.2.1 West State Street Pump Station

The West State Street Pump Station is a submersible station located at 600 West State Street near the intersection of SR-20. This pump station was upgraded in 1997 and is equipped with two submersible pumps, each rated 700 gpm. This pump station serves Sub-basin N, S and T with single-family, agricultural, and commercial land uses. Observing the pump run times year to year since 2000, base sewage flows occurring in dry weather periods have increased. Review of wet weather flows indicate a decrease in flows from 2000 to 2001, corresponding to decrease in rainfall during this period. In November 2001 to February 2001, increased rainfall from the previous year resulted in a subsequent increase in pump run times. From the collected pump run times for January 2000 to February 2004, the observed pump flow data increases when rainfall volume is greater and pump flow decreases with less total rainfall totals. Therefore, rainfall has significant influence upstream of this pump station during the wet weather season as observed through the summer pump run times and an increase in the base-flow.

4.4.2.2 John Liner Road Pump Station

The John Liner Road Pump Station is a wet well mounted station located near the intersection of John Liner Road and Central Avenue North. This pump station was built in 1989 and equipped with two pumps, each optimally rated at 300 gpm. The area upstream of this pump station (Sub-basin E) consists of

approximately 198 acres of single-family residential and open space land. From the observed pump run times at the station during the dry weather summer months, the upstream sewage flow has been consistent from year to year with minimal increases in the sewage base-flow component. However, observations of the wet weather seasonal pump run times indicate that rainfall does have a significant influence upstream of this pump station. Increased contributing inflow and infiltration accounts for the more than 30% increase in pump run times during the wet weather season. Yearly fluctuations in rainfall show the link between rainfall and inflow and infiltration: during the winter of 2000/2001 the wet weather influence was marginal due to low rainfall. During the winter of 2001/2002, however, the wet weather influence was significant and more typical rainfall resulted in almost 90% more inflow and infiltration into the system.

4.4.2.3 Cook Road Pump Station

The Cook Road Pump Station is a submersible station located near the intersection of Prospect Road and Cook Road, east of Janicki Fields on the south side of Cook Road. The station was constructed in 1998 and services approximately 62.1 acres of Sub-basin S. The pump station is equipped with two submersible pumps each capable of delivering an estimated 265 gpm from the existing pumps. Since 2000, the total sewage flow upstream of this station has more than quadrupled according to the pump run time records. As observed from the wet weather pump run times, there has been a small or insignificant amount of wet weather influence from inflow and infiltration into the upstream pipes of Sub-basin S. For the first two months of 2004, the flow has increased more than 40 to 50% over the previous years' first two months of pump run times. This continues the trend observed from January 2000.

4.4.2.4 Mountain View Estates Pump Station

The Mountain View Estates Pump Station is located near the intersection of SR-9 and Cultus Mountain Drive and services two small neighborhoods within Sub-basin F of approximately 28 acres. This station is equipped with two submersible pumps capable of delivering up to 120 gpm of sewage flow and was remodeled in 2001. This pump station serves primarily residential and undeveloped residential land. The upstream contributing flows are based upon pump run times from January 2002 to February 2004. The wet weather component of flow does not contribute significant increases during the winter months according to the pump run time records.

4.4.2.5 Hodgin Street Pump Station

The Hodgin Street Pump Station is located on Hodgin Street near its intersection

with SR-20 and services Sub-basin T. The Hodgin Street Pump Station is equipped with two submersible pumps each capable of delivering 510 gpm of sewage flow. This pump station services primarily residential and undeveloped residential land upstream of the pump station. This station was built in late 2003, and little or no upstream flow data or pump run time was available for the pump station analysis.

4.4.2.6 Holtcamp Pump Station

The Holtcamp Street Pump Station is located on SR-20, 700 feet east of Holtcamp Road and services Sub-basin T. Construction of the Holtcamp Pump Station is expected to be completed in 2005. This pump station will be equipped with two 400 gpm pumps to service primarily commercial and industrial land upstream of the pump station. This station will be designed as a submersible skid mounted station.

4.4.2.7 West Jones Pump Station

The West Jones Pump Station is located at the corner of F&S Grade Road and West Jones Road with two submersible pumps, a backup generator, and impellers that can initially pump 250 gpm with future upgrade capacity up to 890 gpm. The pump station is located to the northwest of Sub-basin R and services primarily undeveloped residential or near-future residential development. The pump station is expected to have construction completed in 2005 with the impeller upgrade in the near future.

4.4.2.8 Klinger Street Pump Station

Klinger Road Pump Station is located on Klinger road in Sub-Basin S. This pump station will transfer sewer flow from north of Brickyard Creek within the proposed Klinger Development. This proposed pump station is to have 185 gpm capacity that will discharge ultimately to the Cook Road Pump Station.

4.4.2.9 Sterling Street Pump Station

The Sterling Road Pump Station is located on Klinger road in Sub-Basin S. This pump station will transfer sewer flow from north of Brickyard Creek within the proposed Klinger Development. This proposed pump station is to have 185 gpm capacity that will discharge ultimately to the Cook Road Pump Station.

4.4.3 Wastewater Treatment Plant

The City of Sedro-Woolley owns and operates the wastewater treatment plant located near the intersection of Alexander and Fourth Street. The wastewater plant was initially constructed in 1973 with modifications completed in 1998. The plant discharges effluent

into the Skagit River through a 24-inch outfall with siphon. Sludge is stored in two digesters and periodically trucked off-site to be used in environmentally sound ways. Various other facilities at this plant include headworks screen, clarifiers, aerating basin, pumps, secondary clarifiers and UV disinfection. The secondary treatment facilities were completed in 1973.

Table 4-3

City of Sedro-Woolley

Pump Station Characteristics

Pump Station Name	Date Built / Remodeled	Wet Well Size (ft)	Station Type	# Pumps	Pump Make	Pump Model	Impeller Size	Motor hp	Pump Capacity gpm (each)	Total Capacity gpm
Cook Road	1998	72" Diameter	Submersible	2	ABS	APF1046 M70/4-22.60FM	243mm	3-Phase 9.4 hp	265 @ 58'	265
West State Street	1998	96" Diameter	Submersible	2	ABS	AFP1044/4-31.60FM	240mm	17.5 hp	700 @ 45'	700
Mountain View Estates	2001	72" Diameter	Submersible	2	ABS	AFP1040-M15/6 (EX)	6.34"	2 hp	120 @ 9'	120
Hodgin Road	2003	96" Diameter	Submersible	2	Meyers	4VCX75M-43	10.3"	7.5 hp	510 @ 36'	510
Holtcamp	2005-future	96" Diameter	Submersible	2	TBD	TBD	TBD	TBD	400 @ 34'	400
John Liner Pump Station	1989	72" Diameter	Above Ground	2	Smith & Loveless	4B2B	-	5 hp	300 @ 23'	300
West Jones Pump Station	2004-near future	72" Diameter	Submersible	2	ABS	TBD	-	TBD	250 initially, 800 ultimate	TBD
Klinger Street	2004	96" Diameter	Submersible	2	Smith & Loveless	4B2B	7 7/8"	3 Phase 3 hp	185 @23'	185
Hospital – Sterling Drive	2005-future	TBD	Submersible	2	TBD	TBD	TBD	TBD	TBD	TBD

Note: TBD = To be determined.

5.6.6 Overflows

Overflows or new overflow structures are NOT permitted.

5.7 PIPE SIZING

All gravity collection sewers shall be a minimum of 8-inch diameter unless a specific exception is granted by the City to allow for 6-inch diameter lines. Conditions for consideration of six-inch mains are as follows:

- The probable maximum number served should not exceed four single-family residences or 10 multi-family residences, except as specifically approved by the City.
- The maximum length between access devices shall not exceed 150 feet without City approval.
- A manhole shall be provided where the 6-inch line connects to a larger line and access devices cannot substitute for manholes. An access device or manhole shall be provided at the end of the six-inch main. If an access device is used, the first manhole shall be placed within 150 feet of the end of the line.
- There shall be no possible extension of a 6-inch main.
- The minimum allowable slope on 6-inch lines shall be 2 feet per 100 feet (2%).
- Six-inch pipes shall be PVC (ASTM D 3034, SDR 35) or ductile iron (ASTM A 21.51). Glued joints are not acceptable.

Pressure sewer, outfall and force main pipe sizing shall be as hydraulically justified and approved by the City.

5.7.1 Roughness Coefficient

An "n" value of 0.013 (with 0.8 full flow) shall be used in Manning's formula for the design of sewer facilities, regardless of type of pipe, except inverted siphons, where an "n" value of up to 0.015 can be used.

5.7.2 Downsizing

Downsizing of sewer lines, or the installation of a smaller diameter line downstream of a larger diameter line, will not be allowed unless otherwise approved by the City. The downstream lines shall be upgraded as necessary.

5.8 PIPE SLOPE

All sewers shall be designed and constructed to give mean velocities at of not less than 2.0 feet per second. Table 5-3 shows the minimum allowable slopes for different pipe sizes. Slopes greater than those indicated are desired, particularly under low flow conditions.

feasible last alternative by the City. Location of the nearest sewers shall be checked with the City prior to presenting stream crossing alternative. The area served by a stream crossing shall be maximized.

5.11 MANHOLES

Manholes are to be installed at the end of each line 8-inches in diameter or greater. Manholes shall also be installed at all changes in grade, size, or alignment, at all intersections and at distances not greater than 300 feet for sewers unless otherwise approved by the City.

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

A drop of up to 24 inches may be allowed if approved by the City and should be accommodated in the manhole channel in order to prevent deposition of solids.

Flow channels in manholes shall be of shape and slope to provide smooth transition between inlet and outlet pipes and to minimize turbulence. The channeling height shall be to the crown of the sewer main. Benches shall be sloped from the manhole walls toward the channel to prevent solid accumulation. All manhole connections shall be made with flexible joints which allow the manhole to settle without destroying the watertight integrity of the connection. Manhole channels shall be lined with plastic or fiberglass, unless otherwise specified by the City.

New manholes shall be vacuum tested according to ASTM C1244.

5.12 PUMPING STATIONS

This section covers the design and construction of sewage pump stations and force mains.

5.12.1 Location and Flood Protection

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

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

Table 6-1
City of Sedro-Woolley
Collection System Projects

Project No./ Year	Project Name (with City CIP #)	Project Function	Estimated Cost (1)
1 2004	Metcalf Street Sewer Replacement Phase 1 (P1)	Replacement of existing 8" Sanitary Sewer collection system along portions of SR-20 (a.k.a. Moore Street) to the trestle with approximately 1600 LF of 18" diameter sewer main. This project is required to accommodate flows from the proposed West Jones Pump Station and force main described in Projects 3 & 4.	$ 500,000
2 2005	Metcalf Street Sewer Replacement Phase 2A and 2B – Northern to State (P2)	Phase 2 of the Metcalf Street Replacement project is projected for replacement of 8, 10 and 12-inch pipe along Metcalf Street from Northern to State to accommodate flows from West Jones Pump Station and forcemain described in Projects 3 & 4. Phase 2A, which has been completed, included the replacement of main along Metcalf from the trestle to the intersection with Northern. Phase 2B is for the replacement of the remaining main along Metcalf, from the termination of project 2A (at Northern) to State Street. Phase 2B includes the replacement of 2,800 LF of existing main with 18-inch and 24-inch diameter pipe.	Phase 2A: Complete Phase 2B: $ 600,000
3 2005	West Jones Pump Station (PS1)	The West Jones Pump Station is currently under design and is proposed to serve the area to the northwest of Metcalf Street. Design, specification, engineering, and construction of the 890 gpm pump station at the F&S Grade Road and West Jones Road is needed. The new facility is proposed to be on line in 2005.	$ 400,000
4 2004-2005	Garden of Eden Gravity Sewer and Forcemain (P3)	This project provides sewer service to areas along West Jones Road and F&S Grade Road to East Jones Road and then southward along Garden of Eden Road with an 12-inch gravity line for 1680 LF and 8-inch gravity line for 1600 LF collecting side sewer flows. This sewer flows north along Garden of Eden and west along West Jones Street to the West Jones Pump Station. A forcemain then pumps sewer flows from the pump station through approximately 3440 LF of forcemain to the intersection of F&S Grade Road and connects to a forcemain in an easterly direction for 280 LF to the existing manhole on West Moore Street. If full build-out is realized sooner, the 2010 construction startup time could begin sooner.	$1,320,000
5 2005	State Route 20 – Phase 1 (P4)	Phase 1 of the SR - 20 upgrade starts at Trail Road with a connection at the Trail Road sewer manhole with a new 12-inch diameter sewer gravity line and terminates at the Hodgin Pump Station forcemain end. This upgrade also provides 1000LF of new 6-inch forcemain from the Hodgin Pump Station to the new 12-inch gravity line. The approximate length of the new 12-inch sewer is 1400 LF.	Complete
6 2006	State Route 20 – Phase 2A & 2B (P5)	Phase 2 of the State Route 20 upgrade starts at Hodgin Pump Station (down-stream) and terminates at the start of Holtcamp Pump Station. Includes approximately 1750 LF of 8-inch, 1100 LF of 10-inch, and 1900 LF of 6-inch force main.	Phase 2A: Complete Phase 2B $1,000,000

Project No./ Year	Project Name (with City CIP #)	Project Function	Estimated Cost (1)
21	North of Warner Street Alley Rehabilitation/Replace-ment (S3)	Rehabilitation of sewer main in parallel alley north of Warner Street, to Third Street, and westward in parallel alley north of Talcott Street Inspect and repair 1200 LF of 8-inch and 500 LF of 24-inch sewer main.	$ 315,900
22	Ball Street Rehabilitation/ Replacement(S4)	Replace or rehabilitate sewer mains along Ball Street and laterals north of Pacific Street and Ferry Street. Approximately 3000 LF of 8-inch diameter sewer mains.	$486,000
23	North of Warner Street and East of Township Street Re-habilitation/Replacement (S5)	Replace or rehabilitate sewer main north of Warner in alley and west of Township Street. Approximately 1300 LF of 8-inch diameter sewer mains.	$ 210,600
24	Waldron Street West of Township Rehab-ilitation/Replacement (S6)	Replace or rehabilitate Sewer main on Waldron Street west of Township Street. Approximately 950 LF of 8-inch diameter sewer main.	$ 153,900
25	Borseth Street north of Washington Street Rehab-ilitation/Replacement (S7)	Replace or rehabilitate approximately 900 LF of 8-inch diameter sewer main.	$ 129,600
26	North of Pacific Street and West of Eastern Street Alley Rehabilitation/Replace-ment (S8)	Replace or rehabilitate Approximately 500 LF of 8-inch diameter sewer main.	$ 81,000
27	Ball Street, south of Chester Avenue Rehabilitation/ Replacement (S9)	Replace or rehabilitation, inspection, design, bid, construction of approximately 300 LF of 8-inch diameter sewer main.	$ 48,600
28	North Skagit Tribe Extension from the northeastern area of UGA (S10)	Plan, design, and construct a new 12-inch gravity sewer extension, forcemain, and pump station from Upper Skagit Tribe location south along Helmick Road and connecting to the sewer main along SR-20. Approximately 25,000 LF of sewer would be required for this project. An alternative option would be to cross Northern State Multi-Service Center with an easement, obtain creek crossing permit, construct pump station, forcemain, and gravity flow to McGarigle Road.	$ 4,750,000 (Total Project Cost – Includes Contributions by Others)

Descriptions of existing conditions and required improvements summarized in Table 6-1 are provided below. Please refer to Section 9 for additional information regarding financing alternatives for each project

Project 1 - Metcalf Street Sewer Replacement – Phase 1

Phase 1 of the Metcalf Street Sewer Replacement project is the first of a two phase project required to accommodate additional flows from that portion of the UGA which lies north and west of drainage Sub-basin P and extend service to Sub-basin R. Flows from the proposed West Jones Road Pump Station and force main as described in Projects 3 and 4, and the additional flows resulting from providing service to the un-sewered area in this portion of the City create the need for approximately 1600 LF of 18-inch sewer main. The current 8-inch and 10-inch diameter is undersized to service the full 890 gpm future flow rate as well as additional developments gravity flowing to this sewer main from the northeast. From the existing model result runs, future flows into the downstream Metcalf Street sewer main will backwater the system and exhibit full pipe capacity flow. Replacement of this Metcalf Street sewer main totals approximately 1,600 LF under Phase 1 of this project. The project is expected to be constructed in 2005.

Project 2 – Metcalf Street Sewer Replacement – Phase 2A and 2B

Phase 2 of the Metcalf Street Sewer Replacement project is for replacement of the north-south 8, 10, and 12-inch diameter main along Metcalf Street. This project is directly related to Project 1 and will accommodate increased flows anticipated from the proposed West Jones Road Pump Station and force main identified in Projects 3 and 4. Replacement of the existing mains with an 18 to 24-inch diameter main is required to provide necessary increased capacity and accommodate future flows from the existing un-sewered northwestern portion of the City. From the existing model results, full capacity flow is anticipated but no threat of SSO from the manholes is anticipated. Approximately 2,800 LF of sewer main is identified for replacement under the Metcalf Street Sewer Replacement – Phase 2B. Phase 2A, the portion of the project which is north of Northern, is complete.

Project 3 – West Jones Road Pump Station

Developers have expressed an interest in platting residential areas surrounding the intersection of F&S Grade Road and West Jones Road. The new pump station will be located near the intersection of F & S Grade Road and West Jones Street and is expected to be a two pump skid mounted pump station with full build-out peak flow of approximately 900 gpm. The new facility will serve the western portion of the UGA. The area serviced will depend on the depth of wetwell storage available. Due to the flat topography surrounding this area, the pump station is proposed to connect new gravity sewage flow from West Jones Road, Garden of Eden Road, and a small portion of W.

Moore Street via a dual forcemain trenched from this pump station to West Moore Street. In the interim, before the final 900 gpm full discharge buildout from a full development, a 250 gpm pumped discharge is allowable downstream to Metcalf Street. After the Metcalf Street improvements have been completed, the full 900 gpm flow can be discharged. This pump station is under design and proposed for construction in 2005. The force main from the new Pump Station is included under Project 4.

Computer modeling of the downstream system indicated that with 900 gpm pumped from that area to the sewer main downstream through W Jones Road, the downstream sewer main system will need to be upsized to provide additional sewage capacity. When the design phase begins, the sizing along Jones and Metcalf will need to be re-evaluated more closely to determine the minimum size required for ultimate build-out. From preliminary calculations, the minimum size required is approximately 15-inch diameter with pipe material affecting the discharge rate due to a lower Manning's n value than the existing concrete pipe. Several manholes are close to overflow conditions when this additional flow is added to the existing model under worse case scenarios. Additional discussion of required upgrades is provided under Project 1, 2, & 4.

Project 4 – Garden of Eden Gravity Sewer and Forcemain

This project provides sewer service to areas along West Jones Road and F&S Grade Road to East Jones Road and then southward along Garden of Eden Road with an 12-inch gravity line for 1680 LF and 8-inch gravity line for 1600 LF collecting side sewer flows. This sewer flows north along Garden of Eden and west along West Jones Street to the West Jones Pump Station. A forcemain then pumps sewer flows from the pump station through approximately 3440 LF of forcemain to the intersection of F&S Grade Road and connects to a forcemain in an easterly direction for 280 LF to the existing manhole on West Moore Street. If full build-out is realized sooner, the 2010 construction startup time could begin sooner.

Project 5 – State Route 20- Phase 1

This State Route 20 project is located in the southeastern portion of the City and consists of several phases described in projects 5, 6, 7, 11, and 12. The overall project is for provision of sanitary sewer service to the auto-commercial and industrial zones along SR-20. Project 5 is for Phase 1 of the SR - 20 upgrade project and starts at Trail Road with a connection at the Trail Road sewer manhole. Approximately 1400LF of new gravity sewer line has been installed from that location to the Hodgin Pump Station,. This upgrade also provides 1000 LF of new 6-inch forcemain from the Hodgin Pump Station to the new 12-inch gravity line.

measures to identify problems and potential solutions for both the Multi-Service Center and the downstream collector line that is owned by Skagit County and extends from the Multi-Service Center to the City's existing collector on McGarigle Road. Additional monitoring of flows and video inspection of lines within the public-use compound is recommended to develop a more comprehensive understanding of contributing factors to the high levels of I & I within the 250 acre complex. In addition to flow monitoring, smoke testing and/or video inspection of the downstream Skagit County line is recommended.

This project should result in a specific recommendation for remediation of the problems as discussed in Project 10. Project funding from the State and County is recommended with the City contributing available expertise and manpower.

Project 10 – Northern State Multi-Service Center I & I Rehabilitation Project

Based on the findings of the Study outline in Project 9, a complete rehabilitation project is anticipated for the Northern State facility. Because the system in question is owned and operated by the State of Washington (and to a lesser extent Skagit County), these agencies are expected to contribute to the project cost. It has been included in the City's CIP because City expertise and coordination will be an important element in the overall success of the project and the project is key to the City's strategy for reducing extraneous flows in to the system, freeing up capacity in the collection system and treatment plant. Various alternatives for accomplishing this project are available, including slip-lining existing pipes, pipe bursting and/or pipe lining and grouting. Consideration of alternative methods is likely to reduce rehabilitation costs, extend the life of existing facilities and may assist in location of funding for the project. Additional work to accommodate existing and projected flows from this area and other areas of Sub-basin G is identified in Project 13 – McGarigle Road Sewer Line Replacement.

Project 11 – Sterling Road Pump Station

The Sterling Road Pump Station is located off of SR-20 near the Skagit Hospital and will provide additional capacity downstream from this area as well as provide cleanout velocities in the 8-inch SR-20 sewer main. Presently, the sewer main along SR-20 exhibits excessive grease and connection issues that should be improved with the construction of this pump station. This pump station is anticipated to be a skid mounted two pump system with maximum system capacity of approximately 170 gpm with the majority of this pump station service being extended to the hospital.

Project 12 – Holtcamp Pump Station

The Holtcamp Pump Station is anticipated for construction in 2004 with 1900 LF of 6-inch forcemain to be included within the SR-20 Phased Project. The pump station is located immediately east of the intersection with Holtcamp Road along SR-20. This pump station

acts as a booster station. (See also Project 6)

Project 13 – Township Street to Treatment Plant Interceptor Replacement

This sewer main replacement and/or rehabilitation project for the Township Street sewer main is recommended for the existing 15-inch to 18-inch sewer main located along portions of Township Street south of Bennett Street to Sterling and west to the treatment plant. Approximately 3700 lineal feet of 30-inch and 250 LF of 36-inch sewer main is anticipated. The results of the Northern State I & I reduction as discussed in Projects 9 and 10 may reduce pipe sizes for this phase of the Township Street Sewer Main Replacement. With new developments occurring near the golf course and servicing the existing developments draining into the Township interceptor line, the current capacity is at maximum within this sewer main. No SSO is presently occurring according to the model, but full residential build-out, I & I influence, and future age of the upstream system will continue to tax this system for additional capacities that may cause SSOs in the future. This project would be started for design and construction after the alley upgrade sewer pipe that is parallel to Sterling Street prior to entering the Treatment Plant. The size of this upgrade is recommended at 30-inches unless the I & I improvements upstream prove to be an effective solution to decreasing sewage flows after post construction monitoring has been completed in the Northern State Multi-Service Center.

Project 14 – Township Street Interceptor Replacement – Phase 1

Phase 1 of the Township Street Interceptor includes upsizing of existing undersized pipe from Bennett Street to State Route 20 is included and is expected that approximately 3300 LF of 30-inch is required. The results of I & I reduction as discussed in Projects 9 and 10 may allow for reduced pipe sizes for this phase of the replacement project. Additional discussion of the overall Township Street Sewer Replacement project is provided below under Projects 15 and 16.

Project 15 Township Street Interceptor Replacement – Phase 2

This sewer main replacement and rehabilitation project for the Township Street sewer main is recommended for the existing 12-inch to 15-inch sewer main located along Township Street north of State Route 20 and south of McGarigle Road. Approximately 2200 lineal feet of 30-inch sewer main will need to be analyzed for design and construction using either alternative rehabilitation methods, replacement, or new sewer interceptor main. The alternative rehabilitation methods include slip-lining and pipe bursting after video inspection and smoke testing sewer mains for illegal connections. The results of the I & I reduction may reduce the pipe size for Phase 2 of the Township Street Sewer Main Replacement to 24-inches. With new developments occurring near the golf course and servicing the existing developments draining into the Township interceptor line, the current capacity is at maximum within this sewer main. No SSO is

SECTION 8
TREATMENT PLANT ANALYSIS AND RECOMMENDATIONS

8.1 INTRODUCTION

The purpose of this section is to evaluate the wastewater treatment facility and to develop recommendations for modifications to the treatment plant. The recommendations are for the purpose of assuring that the City of Sedro-Woolley will continue to meet their discharge permit requirements as well as provide for less labor intensive maintenance and operation of the treatment plant.

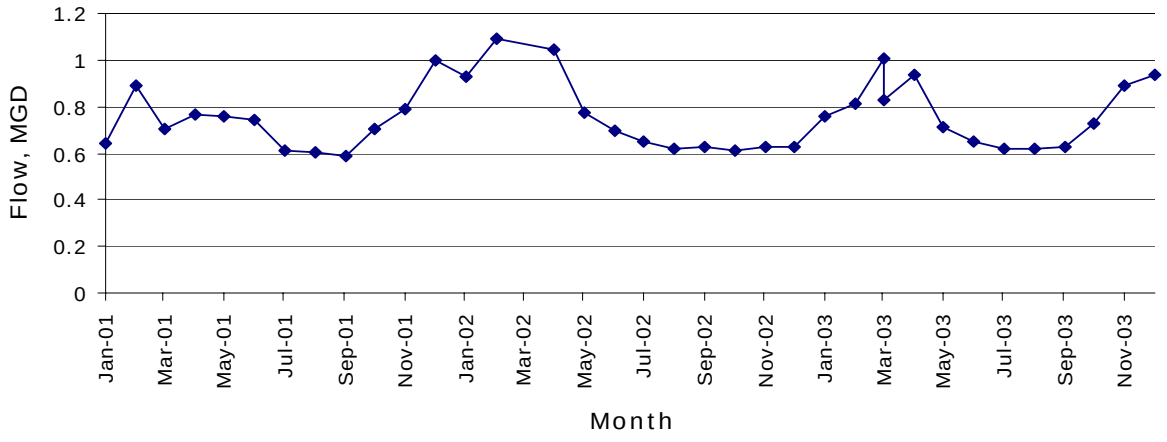
8.2 GOALS AND OBJECTIVES

The primary objective used in the development of the recommendations is meeting the NPDES Permit requirements established by DOE. This includes projecting the point in time when the City will probably need to begin planning to increase the treatment plant capacity. The secondary objective used in developing the recommendations is increased ease of treatment plant operation, redundancy, efficiency, and flexibility.

8.3 EXISTING PLANT FLOWS AND TREATMENT EFFICIENCY

The present system, as described in Section 7, consists of headworks, oxidation ditch, secondary clarifiers, UV disinfection, and solids treatment and dewatering. The plant discharges to the Skagit River. Solids are treated, dewatered and hauled offsite for land disposal. Details of each unit process are included in Table 7-2 along with the design criteria from DOE and the capacity of the process based on those criteria. Historical flow data for the plant is included in Table 8-1 and Figure 8-1.

Figure 8-1
Monthly Average Flow Data



8.4.12 Reuse

The City is planning for water reuse as a means of reducing effluent discharge to the river and promote water conservation. Pursuit of reuse includes identification of nearby potential uses for treated effluent. Effluent reuse would need to follow the requirements of the Washington State Departments of Health (DOH) and Ecology (DOE). The first step in investigating reuse is called the preliminary investigation stage as defined in the DOE Criteria for Sewage works design. This stage includes fact finding in which physical, economic, institutional and legal limitation are identified. All potential sources of reclaimed water and markets should be identified. The following stages of planning include screening of potential markets and detailed evaluation of alternatives to serve selected markets, including engineering and economic feasibility, financial analysis and environmental analysis. The City of Sedro-Woolley's commitment to water reuse is demonstrated by installation of dedicated "purple pipe" intended for future transport of treated effluent. Design of the Township Street interceptor upgrade project includes installation of parallel purple pipe.

8.5 SUMMARY

The existing Sedro-Woolley treatment plant operates at approximate one half of the current capacity. Upgrades due to increases in flow or loading will not be required until flows reach 85 percent of the permit limits. Based on current flow data, it appears that planning for upgrades will not be necessary until at least 2010. Implementation of an effective I & I reduction program, as discussed in previous sections and in Appendix B, would further defer treatment plant upgrades by reducing extraneous flow and increasing available capacity. It is recommended that all future budgeting for the sanitary sewer system include I & I reduction projects and staffing levels consistent with this overall goal.

The plant operates well and meets its permit conditions. Section 8.4 describes changes that can be made to the plant to improve flexibility, reliability and operations. Table 8-5 below shows planning level cost estimates for those potential projects for the 6 year planning period. In some cases, additional planning or design work is necessary. In other cases, plant staff can incorporate the changes as needed.

TABLE 9-1
CITY OF SEDRO-WOOLLEY
SANITARY SEWER SYSTEM CAPITAL FACILITIES PLAN

Proj. No.	Six-Year Capital Improvement Program Schedule	Cost to City ($2004)	Escalated Project Costs 2005	2006	2007	2008	2009	2010	Escalated Total 2005-2010	Recommended Funding
6-1	Metcalf Street Sewer Replacement Phase 1 (P1)	500,000	500,000	-	-	-	-	-	500,000	2005 Budget
6-2	Metcalf Street Sewer Replacement Phase 2: Northern to State (P2)	600,000	-	648,960	-	-	-	-	648,960	Bond/PWTF
6-3 & 6-4	West Jones Pump Station (PS1) and Garden of Eden Gravity Sewer & Forcemain (P3)	1,720,000	1,720,000	-	-	-	-	-	1,720,000	Bond/PWTF/ 2005 Budget
6-5	State Route 20 - Phase 1 (P4)	complete	-	-	-	-	-	-	-	Complete
6-6 & 6-12	State Route 20 - Phase 2 (P5) and Holtcamp Road Pump Station & Forcemain (PS2)	1,350,000	445,750	958,250	-	-	-	-	1,404,000	PWTF/Rates/Reserves/ Connect. Charges/ Skagit Co. Grant
6-7 & 6-11	State Route 20 - Phase 3 (P6) and Sterling Road Pump Station & Forcemain (PS2)	2,275,000	-	2,460,640	-	-	-	-	2,460,640	Bond/PWTF
6-8	West Nelson Street Sewer Extension (P7)	479,750	-	-	-	561,240	-	-	561,240	PWTF/Rates/Reserves/ Connect. Charges
6-9	Northern State Multi-Service Center I&I Study (M1)	25,000	25,000	-	-	-	-	-	25,000	2005 Budget
6-10	Northern State Multi-Service Center I&I Replacement/ Rehabiltation(M2)	500,000	-	-	-	584,929	-	-	584,929	City Share = PWTF/Rates/Reserves/ Connect. Charges + $1,500,000 from others
6-11	See 6-7	-	-	-	-	-	-	-	-	
6-12	See 6-6	-	-	-	-	-	-	-	-	
6-13	Township Street to Treatment Plant Sewer Main Replacement (P10)	982,500	-	1,062,672	-	-	-	-	1,062,672	Bonds/PWTF
6-14	Township Street Sewer Main Replacement - Phase 1 (P11)	950,000	-	1,027,520	-	-	-	-	1,027,520	Bonds/PWTF
6-15	Township Street Sewer Main Replacement - Phase 2 (P12)	700,000	-	757,120	-	-	-	-	757,120	Bonds/PWTF
6-16	Township Street Sewer Main Replacement - Phase 3 (P13)	1,113,000	-	1,203,821	-	-	-	-	1,203,821	Bonds/PWTF

Proj. No.	Six-Year Capital Improvement Program Schedule	Cost to City ($2004)	Escalated Project Costs 2005	2006	2007	2008	2009	2010	Escalated Total 2005-2010	Recommended Funding
6-17	Sapp Road Extension (P14)	775,000	-	-	-	906,640	-	-	906,640	PWTF/Rates/Reserves/ Connect. Charges
6-18	McGarigle Road Sewer Main Replacement (P15)	1,296,000	-	1,401,754	-	-	-	-	1,401,754	Bonds/PWTF
6-19	North of Fidalgo Alley Rehabilitation/Replacement (S1)	145,800	-	-	-	170,565	-	-	170,565	PWTF/Rates/Reserves/ Connect. Charges
6-20	South of Talcott Street Alley Rehabilitation/Replacement (S2)	235,500	-	-	-	-	-	297,983	297,983	PWTF/Rates/Reserves/ Connect. Charges
6-21	North of Warner Street Alley Rehabilitation/Replacement (S3)	315,900	-	-	-	-	-	-	-	PWTF/Rates/Reserves/ Connect. Charges
6-22	Ball Street Rehabilitation/Replacement (S4)	486,000	-	-	-	-	-	-	-	PWTF/Rates/Reserves/ Connect. Charges
6-23	North of Warner Street & East of Township Street Rehabilitation/ Replacement (S5)	210,600	-	-	-	-	-	-	-	PWTF/Rates/Reserves/ Connect. Charges
6-24	Waldron Street West of Township Street Rehabilitation/Replacement (S6)	153,900	-	-	-	-	-	-	-	PWTF/Rates/Reserves/ Connect. Charges
6-25	Borseth Street North of Washington Street Rehabilitation/Replacement (S7)	129,600	-	-	-	-	-	-	-	PWTF/Rates/Reserves/ Connect. Charges
6-26	North of Pacific Street & West of Eastern Street. Alley Rehabilitation/ Replacement (S8)	81,000	-	-	-	-	-	-	-	PWTF/Rates/Reserves/ Connect. Charges
6-27	Ball Street South of Chester Avenue Rehabilitation/ Replacement (S9)	48,600	-	-	-	-	-	-	-	PWTF/Rates/Reserves/ Connect. Charges
6-28	North Skagit Tribe Extension from NE Area of UGA (S10)	-	-	-	-	-	-	-	-	$4,750,000 (2004$) To be paid by Tribe
6-29	Minkler-Fruitdale to Hoehn Road Forcemain & Minkler Pump Station (P9)	700,000	-	-	-	-	-	-	-	PWTF/ Connect. Charges
6-30	Comprehensive Sewer Plan Update (M2)	150,000	-	-	-	-	-	189,798	189,798	PWTF/Rates/Reserves/ Connect. Charges

Proj. No.	Six-Year Capital Improvement Program Schedule	Cost to City ($2004)	Escalated Project Costs 2005	2006	2007	2008	2009	2010	Escalated Total 2005-2010	Recommended Funding
6-A	SR-20 Sewer Main Analysis Study	45,000	-	-	50,619	-	-	-	50,619	Rates/Reserves/ Connection Charges
6-B	Annual Pump Station Rehabilitation	30,000	-	-	-	11,699	12,167	12,653	36,518	Rates/Reserves/ Connection Charges
6-C	Annual Renewal & Replacement		Included as separate projects for 2005-2010							Connection Charges
6-D	Annual Repair Existing Sewer System - Emergency	450,000	50,000	54,080	84,365	87,739	121,665	126,532	524,381	Rates/Reserves/ Connection Charges
6-E	Annual I&I Reduction Program	30,000	-	-	-	11,699	12,167	12,653	36,518	Rates/Reserves/ Connection Charges
6-F	Develop Grease Program	10,000	-	-	-	11,699	-	-	11,699	Rates/Reserves/ Connection Charges
6-G	Telemetry Upgrade - Existing Pump Station (Fiber Optic)	120,000	-	-	-	46,794	48,666	50,613	146,073	Rates/Reserves/ Connection Charges
8-5	Clarifier Number 1 Repair	240,000	-	-	269,967	-	-	-	269,967	Rates/Reserves/ Connection Charges
	Project Costs 2005-2010	14,722,550							15,998,418	
	Project Costs 2011 +	2,125,600								
	Total Project Costs	**16,848,150**								
	OTHER CAPITAL REQUIREMENTS (O&M RELATED)									
8-1	Move Sodium Hypochlorite Injection	9,000							9,000	Rates/Annual Budget
8-2	Sump Pumps	15,600							15,600	Rates/Annual Budget
8-3	Plant Water Pumps	13,200							13,200	Rates/Annual Budget
8-4	Clarifier Hydraulic Issue	42,000							42,000	Rates/Annual Budget
8-6	Digester Overflow	15,930							15,930	Rates/Annual Budget
8-7	Flood Protection (Initial Planning, no capital cost)	12,000							12,000	Rates/Annual Budget
8-8	Influent Pump VFD's	60,000							60,000	Rates/Annual Budget
8-9	Anoxic Tank Repairs	55,200							55,200	Rates/Annual Budget
8-10	Sludge Dryer	90,000							90,000	Rates/Annual Budget
8-11	Clarifier #2 Scum Issue (Planning, no capital cost)	6,000							6,000	Rates/Annual Budget
8-12	Reuse (Planning, no capital cost)	30,000							30,000	Rates/Annual Budget

Budget incl. 331,000 toward project 6-2. Difference between budget and above est. for W Nelson & Garden of Eden is $511,740.

TABLE 9-2
CITY OF SEDRO-WOOLLEY
CAPITAL FACILITIES PLAN FUNDING SOURCE SUMMARY

Funding Sources for CFP	2005	2006	2007	2008	2009	2010	TOTAL
Budget 2005/Carryover Budget 2004 *	2,071,000						2,071,000
Grant from Skagit County	445,750						445,750
New Revenue Bond, 2005							
New Loans (Assume PWTF)		9,500,000	-	2,000,000	-	268,000	11,768,000
Rates	50,000	54,080	134,984	169,629	194,664	202,451	805,809
Reserves / Connection Charges	174,000	20,736	269,967	223,375		219,780	907,859
Total	**2,740,750**	**9,574,816**	**404,951**	**2,393,004**	**194,664**	**690,232**	**15,998,418**

**** $331,000 toward project 6-1, project 6-3 and project 6-4 are in one budget with $1,000,000 in 2005; Project 6-9 include $20,000 in 2005; Add $1,362,750 carryover from budget 2004.***

Anticipated New PWTF Loan Repayment at 1.0% Interest

	2005	2006	2007	2008	2009	2010
2006 Loan	-	85,500	595,000	590,000	585,000	580,000
2008 Loan	-	-	-	18,000	125,263	124,211
2010 Loan	-	-	-	-	-	2,412
Total	**-**	**85,500**	**595,000**	**608,000**	**710,263**	**706,623**

SECTION 10

FINANCIAL PLAN

10.1 INTRODUCTION

This balanced financial plan has been developed as a guide to show what can be expected for financial performance in the next six-years as the City follows the capital facilities plan and other recommendations of this plan. Capital financing in terms of borrowing will be required to complete the projects identified. The City also evaluated monthly rates and facilities charges along with this planning effort. The resulting schedule of rates and facilities charges adopted by the City Council is reflected in this chapter.

10.2 FINANCIAL HISTORY

The City of Sedro-Woolley owns and operates the sanitary collection system and treatment plant within the City. The City accounts for all sewer financial activity within several sewer-related funds. The two main funds are the sewer operating fund (401) and the cumulative reserve/sewer facilities fund (410). The sewer financial activity has been combined in Table 10-1 to reflect the summary three-year history.

Table 10-1
City of Sedro-Woolley
Summary Sewer Financial History

	Actual	Actual	Est.
Sewer Financial Activity	**2002**	**2003**	**2004**
Revenue			
Sewer Service Charges	$1,775,915	$1,824,363	$1,884,947
Sewer Connection Fees	484,618	333,630	283,570
Special Sewer Connections	-	-	-
Late Penalties & Interest	1,215	4,609	6,500
Misc.(sale of scrap, fix assets, refund)	75,980	320	55,000
Investment Interest	91,225	65,306	52,884
Grant from FEMA	-	-	1,093
Subtotal Revenue	$2,428,953	$2,228,228	$2,283,994
Expenditures			
Maintenance & Operations	840,777	824,055	951,266
Capital Outlay	528,525	246,127	3,551,749
Admin Charge - Transfer to 001	55,000	110,950	111,000
1998 Revenue Bond - Transfer to 407	400,000	400,000	500,000
Equipment Replacement Fund - Transfer to	208,870	176,220	200,000
Taxes and Assessments	-	19,044	-
Subtotal Expenditures	$2,033,172	$1,776,396	$5,314,015
Est. Ending Balance Sewer Operating + Cum. Reserve Funds			*$2,336,899*

The sewer revenue has been sufficient to pay for maintenance, operations, administrative charges and debt repayment in all years. Beginning in 2004, the City has embarked on a major sewer capital program to invest in replacement and expanding capacity of its sewer mains in the core of the City. A sewer moratorium has been in place since late 2004 in certain areas. As sections of the improvement program are completed, the sewer moratorium will be lifted. There is sufficient capacity in the treatment plant with the planned main replacement program to serve the City within the planning period.

Together with embarking on the aggressive capital program, the City increased its sewer general facilities charge from $3,300 to $5,300 in 2004. This was adjusted to $7,266 in 2005 based on the outcome of the connection charge study. The monthly rates for single family were adjusted from $37.75 to $41.75 with the 2005 rate study and are expected to be $45.75 per month beginning 2007. The City also introduced a low-income discount for qualified senior/disabled homeowners in 2005. This combination of increases will allow the City to borrow the necessary funds and complete the capital program required to remove the moratorium and provide for economic development within the City.

The City prepares an annual budget that includes operating, debt and capital expenditures. The annual process involves review of financial projections and adoption of a balanced budget. Every several years, the City completes a rate study to provide updated projections of revenue and expenditures for the next three to six years.

10.3 SEWER UTILITY FUNDS

The City of Sedro-Woolley has five funds related to the sewer utility.

- Sewer Fund 401 – This is the operating fund for sewer activity. Sewer service charges are the primary revenue source for this fund. Other sources include late payments, interest, miscellaneous and capital funding such as grants, loan proceeds or transfers from the cumulative reserve fund. The uses of the fund include maintenance, operations, capital expenditures, and transfers to the general fund for administrative/finance support, the 1998 revenue bond fund for debt repayment and the equipment replacement fund.

- Cumulative Reserve/Sewer Facilities Fund 410 – This fund captures the reserves set aside for capital improvements. The main revenue source is connection fees/general facilities charges. Interest is also earned on the fund balance. Typically expenditures are not made in this fund, rather a transfer is made to sewer fund 401 for capital improvements underway and to sewer debt fund 407 for debt service payments.

- 1998 Sewer Revenue Bond Fund 407 – This is a restricted bond fund that is tied to the repayment of the 1998 sewer revenue bonds. The 1998 revenue bonds are supported by assessments, rates and connection charges. The assessments are deposited into

this fund and transfers are made from funds 401 and 410 for the remainder of the annual debt service payment. The City splits the bond payment 50/50 between rates and connection fees, or about $250,000 each per year.

- Revenue Bond Reserve Fund 411 – This is a restricted bond reserve fund that is required as a covenant of the 1998 sewer revenue bonds. Additional contributions are not required and these funds can be used to make the last debt payments on the 1998 revenue bonds.

- Sewer Treatment Construction Fund 331 – This was a special construction fund established to receive and disburse the proceeds from the 1998 sewer revenue bonds. It is anticipated that the minor balance will be spent in 2005 and this fund will be closed.

The financial plan for the capital improvements includes a major loan from the Washington State Public Works Trust Fund. The City may wish to consider establishing a project fund to deposit the loan proceeds, earn interest and account for all transactions related to the project. This will assist the City in closing out the loan, determining the full cost of the project and calculating the local match. A 10% local match provides a 1% interest rate, while a 15% local match provides a 0.5% interest rate. The final rate will be determined at project close-out.

In addition, the City may wish to consider establishing a debt service fund so that regular transfers can be made to ensure that the annual debt service payments can be made. The City currently manages the revenue bond debt in this manner with regular transfers to the Revenue Bond Fund 407. While this may seem like over-complicating the accounting structure, the benefit is the ability to set aside the debt payment over the year and avoid an over-inflated fund balance in Fund 401 that may be misleading. Typically revenue bond funds are restricted to solely making payments on the outstanding bonds. The City should verify the bond fund requirements with its Bond Counsel before any attempt to co-mingle debt repayments for the Public Works Trust Fund loans.

10.4 FUNDING PRIORITIES

Sewer service charges, or monthly rates, are the primary on-going source of revenue for sewer maintenance, operations, administration, capital and debt service. Any surplus is held in the fund balance and available for capital projects.

General facilities charges (shown as connection fees in the budget) are used for capital improvements, either in the way of debt service payments on previous projects, used for current capital projects, or are set aside in reserves for future capital improvements. Connection fees are deposited into the Cumulative Reserve/Sewer Facilities Fund 410 until appropriated for a specific project or debt repayment. Sewer Inspection Fees are deposited in the operating fund.

The outstanding Sewer Revenue Bond payments are handled in a restricted Fund No. 407. A transfer is made from Sewer Fund 401 each year for the rate portion (approx. $250,000) of the annual payment. Another transfer is made from the Cumulative Reserve/Sewer Facilities Fund 410 each year for the connection fee portion (approx. $250,000) of the debt payment. Assessments are deposited in the bond fund as required. Interest earned remains in the fund for future debt payments.

There are suggestions presented for the City's consideration in the above section related to sewer utility funds about managing the upcoming major capital project and associated debt payments.

The City completes an annual budget that balances the revenue and expenditures for the year. This process involves staff, City management and elected officials and is an important exercise in evaluating changing circumstances and the associated impact on the sewer program and ultimately rates.

As the City moves forward with this financial plan and major sewer improvements, the Council recognized the importance of adopting a multi-year rate that would ensure the loan repayments could be made. While this is reasonable with today's assumptions, it must be verified as the project moves forward and assumptions might have shifted, such as cost, timing, amount of loan, and new connections.

10.5 OUTSTANDING DEBT

The sewer utility has one outstanding debt issue, Sewer Revenue and Refunding Bonds, 1998. This $6,410,000 bond sale included both refunding of outstanding debt and providing for the sewer treatment plant upgrade. The payments are due December 1 and June 1 each year through June 1, 2018. Interest only payments are made in December, with principal included in the June payment. The total outstanding principal at the end of 2004 is $4,930,000.

The 1998 sewer revenue bond also included funding for the Cook Road ULID. The assessments received are deposited directly into the bond fund for debt payments. At the end of 2004, there was $178,000 assessment principal outstanding.

Table 10-2 shows the annual debt service schedule for the 1998 sewer revenue bonds.

Table 10-2
City of Sedro-Woolley
Sewer Revenue and Refunding Bonds, 1998

Debt Schedule	Annual Debt Service	Annual Principal Payment	Principal Balance
2005	504,628	280,000	4,930,000
2006	507,335	295,000	4,650,000
2007	504,283	305,000	4,355,000
2008	500,643	315,000	4,050,000
2009	491,513	320,000	3,735,000
2010	491,691	335,000	3,415,000
2011	495,905	355,000	3,080,000
2012	484,380	360,000	2,725,000
2013	487,508	350,000	2,365,000
2014	455,435	365,000	2,015,000
2015	457,148	385,000	1,650,000
2016	457,594	405,000	1,265,000
2017	452,175	420,000	860,000
2018	450,890	440,000	440,000
Totals	**6,741,126**	**4,930,000**	**-**

10.6 ADDITIONAL CAPITAL FUNDING SOURCES

In addition to pay-as-you-go, seeking grants and selling revenue bonds, the City may also consider low-interest loans from the State of Washington: Public Works Trust Fund, the Department of Ecology's Centennial Clean Water Fund or Clean Water State Revolving Fund. These would be appropriate for large projects serving customers over a long period.

10.6.1 Clarifier Number 1 Repair

Grant funds are a good source of capital funding because the money does not have to be repaid. Unfortunately, grants are not easy to come by. Skagit County has a grant program to participate in projects related to economic development. The City continues to be successful in obtaining these grants. The Department of Ecology has limited grant/loan combinations available for large projects. They use a highly competitive annual cycle with applications due in November of each year. The City should continue to pursue grants when appropriate and available.

10.6.2 Low-Interest Loans

The State of Washington operates several low-interest loan programs for sewer capital projects. The Public Works Trust Fund has both a Pre-Construction and a Construction program with loans with interest rates up to one and a half percent and loan terms up to

20 years. The pre-construction fund is available year round and the construction program is a competitive program with applications due in May. In addition, the Department of Ecology has Centennial Clean Water Fund and the Clean Water State Revolving Fund for qualified projects with low interest rates. The DOE programs have applications due in November.

10.6.3 Bond Sales

The City has the authority to sell several types of bonds that would be appropriate for capital projects: revenue, general obligation, limited general obligation and local improvement district bonds. In general, bonds are a more costly form of funding capital projects than grants and low-interest loans from the State, but the City controls the timing. This can be an attractive funding alternative for major capital projects that will provide service over many years, particularly in times of low interest rates.

10.6.4 Contributions, Joint Projects

Pursuing contributions from benefiting parties or joint projects can provide cost savings to the Sewer fund when appropriate for the project. There is potential with the hospital expansion and the Northern State Multi-Service Center.

10.7 CAPITAL IMPROVEMENTS PLANNED: 2005-2010

The capital improvements identified in Section 9, Capital Facilities Plan have been brought forward into developing the financial plan. The primary focus for the capital program at this time is the removal of the sewer moratorium. Together with the most critical projects to allow for economic development, the immediate projects total approximately $11,500,000 in 2004 dollars. These are all projects identified by the City to be completed in the first three years. From that perspective, numerous scenarios were discussed with the City Council over financing alternatives focusing on these first three years. There were two Council workshops and a public hearing on the various funding scenarios. The preferred scenario is presented in Table 10-3.

Table 10-3
City of Sedro-Woolley
Three-Year Funding Plan for Priority Capital Projects

ALT. 2	ALL PWTF LOAN IN 2006	Estimated $2004	Budget/ Reserve	PWTF 2006
6-1	Metcalf St. Sewer Replacement Phase 1 (P1)	500,000	500,000	
6-2	Metcalf St. Sewer Replacement Phase 2: Northern to State (P2)	600,000		648,960
6-4&3	Garden of Eden Gravity Sewer, Force, W Jones Pump Station	1,720,000	1,720,000	
6-6&12	SR 20 - Ph 2 & Holtcamp Rd. Pump Station/Forcemain	1,350,000	445,750	958,250
6-7&11	SR 20 - Ph 3 & Sterling Rd. Pump Station/Forcemain	2,275,000		2,460,640
6-9	Northern State Multi-Svc Center I&I Study (M1)*	25,000	25,000	
6-13	Township St. to Treatment Plant Sewer Main Replacement(P10)	982,500		1,062,672
6-14	Township St. Sewer Main Replacement - Phase 1 (P11)	950,000		1,027,520
6-15	Township St. Sewer Main Replacement - Phase 2 (P12)	700,000		757,120
6-16	Township St. Sewer Main Replacement - Phase 3 (P13)	1,113,000		1,203,821
6-18	McGarigle Rd. Sewer Main Replacement (P15)	1,296,000	-	1,401,754
	Subtotal this Scenario	**11,511,500**	**2,690,750**	**9,520,736**
	SR20 includes $445,750 anticipated grant from Skagit Co.			
	Project Needs This Scenario	**$11,511,500**	**$2,690,750**	**$9,520,736**

The major difference between the funding plan alternatives related to the financing of the capital projects - selling revenue bonds, general obligation bonds or borrowing from the Public Works Trust Fund. Essentially, the lowest impact on monthly rates was a PWTF loan, yet it requires that the moratorium remain into 2006 for portions of the City, and there is no guarantee that the City's application will rank high enough to be funded. That said, the City Council thought this was a reasonable path to undertake with pre-construction borrowing immediately to begin design of the lines to be ready for construction in 2006.

Tables 10-4 and 10-5 show the six-year capital projects and funding sources. The funding plan includes capital costs escalated to the year of construction at 4% per year. Table 10-4 shows the projects scheduled with the escalated projects costs. Table 10-5 shows the funding sources for the six-year plan.

Sewer rates, facilities charges or reserves are the primary sources of revenue scheduled for the capital improvements. Costly projects that would provide long-term service would be appropriate for long-term debt through low-interest loans, like PWTF or DOE SRF. There is

also the possibility of Centennial Clean Water Funds in the form of combined grant and loan through the Department of Ecology. Overall, this would minimize the impact on rates, preserve existing reserves for future capital projects and continue long-term investment in the sewer system.

Due to the timing, the immediate capital improvements have been scheduled for a PWTF loan with applications due in May, 2005 and funds available in 2006 for construction. The assumption is that PWTF loans would be pursued with the City providing a 10 percent local match and receiving a 1.0 percent interest rate. If local match of 15 percent can be shown at project close-out, the interest rate would be reduced to 0.5 percent. The projects identified for 2005/06 are phased to remove the sewer moratorium. The City should investigate whether the phases completed in 2005 would count as local match for the phases completed with the proposed 2006 loan.

Table 10-4
City of Sedro-Woolley
Sewer Capital Improvement Program

	City of Sedro-Woolley	---------- Escalated Project Costs ----------						TOTAL
No.	**Six-Year Capital Improvement Schedule**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2005-2010**
6-1	Metcalf St. Sewer Replacement Phase 1 (P1)	500,000	-	-	-	-	-	500,000
6-2	Metcalf St. Sewer Replacement Phase 2: Northern to State(P2)	-	648,960	-	-	-	-	648,960
6-3&4	Garden of Eden Gravity Sewer, Forcemain & W. Jones Pump Sta.	1,720,000	-	-	-	-	-	1,720,000
6-6&12	SR 20 - Phase 2 (P5)	445,750	958,250	-	-	-	-	1,404,000
6-7&11	SR 20 - Phase 3 (P6)	-	2,460,640	-	-	-	-	2,460,640
6-8	West Nelson St. Sewer Extension (P7)	-	-	-	561,240	-	-	561,240
6-9	Northern State Multi-Service Center I&I Study (M1)	25,000	-	-	-	-	-	25,000
6-10	Northern State Multi-Svc Center I&I Replacement/Rehab(M2)	-	-	-	584,929	-	-	584,929
6-13	Township St. to Treatment Plant Sewer Main Replacement (P10)	-	1,062,672	-	-	-	-	1,062,672
6-14	Township St. Sewer Main Replacement - Phase 1 (P11)	-	1,027,520	-	-	-	-	1,027,520
6-15	Township St. Sewer Main Replacement - Phase 2 (P12)	-	757,120	-	-	-	-	757,120
6-16	Township St. Sewer Main Replacement - Phase 3 (P13)	-	1,203,821	-	-	-	-	1,203,821
6-17	Sapp Rd. Sewer Extension (P14)	-	-	-	906,640	-	-	906,640
6-18	McGarigle Rd. Sewer Main Replacement (P15)	-	1,401,754	-	-	-	-	1,401,754
6-19	North of Fidalgo Alley Rehabilitation /Replacement (S1)	-	-	-	170,565	-	-	170,565
6-20	S of Talcott St. Alley Rehabilitation/Replacement (S2)	-	-	-	-	-	297,983	297,983
6-30	Comprehensive Sewer Plan Update (M2)	-	-	-	-	-	189,798	189,798
6-A	SR-20 Sewer Main Analysis Study	-	-	50,619	-	-	-	50,619
6-B	Annual Pump Station Rehab	-	-	-	11,699	12,167	12,653	36,518
6-C	Annual Renewal & Replacement	Incl. in CIP	-	-	-	-	-	-
6-D	Annual Repair Existing System - Emergency & Corrective	50,000	54,080	84,365	87,739	121,665	126,532	524,381
6-E	Annual I&I Reduction Program	-	-	-	11,699	12,167	12,653	36,518
6-F	Develop Grease Program	-	-	-	11,699	-	-	11,699
6-G	Telemetry Upgrade Exist Pump Station (Fibre Optic)	-	-	-	46,794	48,666	50,613	146,073
8-5	Clarifier Number 1Repair	-	-	269,967	-	-	-	269,967
	Total Project Costs ($Escalated)	**2,740,750**	**9,574,816**	**404,951**	**2,393,004**	**194,664**	**690,232**	**15,998,418**

Estimated Project Costs escalated at 4.0% per year. Base year of estimates is 2004.

Table 10-5
City of Sedro-Woolley
Sewer Capital Improvement Program

Funding Sources for CIP	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**TOTAL**
Budget 2005 / Carryover Budget 2004*	2,071,000						2,071,000
Grant from Skagit County	445,750						445,750
New Revenue Bond, 2005	-						-
New Loans (Assume PWTF)		9,500,000	-	2,000,000	-	268,000	11,768,000
Rates	50,000	54,080	134,984	169,629	194,664	202,451	805,809
Reserves / Connection Charges	174,000	20,736	269,967	223,375	-	219,780	907,859
Total	2,740,750	9,574,816	404,951	2,393,004	194,664	690,232	15,998,418

$331,000 toward project 6-1; project 6-3 & 6-4 are one in budget with $1,000,000 in '05; project 6-9 incl. 20,000 in '05; add $1,362,750 carryover from budget '04.

Loans assume 10% local match for 1.0% interest rate. Current PWTF program allows a reduction to 0.5% interest with 15% match.

New PWTF Loan Repayment @ 1.0% Interest							
2006 Loan		85,500	595,000	590,000	585,000	580,000	
2008 Loan				18,000	125,263	124,211	
2010 Loan						2,412	16,785
Anticipated PWTF Loan Payment	-	85,500	595,000	608,000	710,263	706,623	

10.8 SIX-YEAR FINANCIAL PLAN

The following three tables present the six-year financial plan and includes the monthly rates and general facilities charges (connection fees) adopted by the City Council in 2005.

Table 10-6
City of Sedro-Woolley
Key Assumptions in Six-Year Financial Plan

SEDRO-WOOLLEY	Dr. Bdgt.	Projected	Projected	Projected	Projected	Projected
SIX-YEAR FINANCIAL PLAN	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
ASSUMPTIONS:						
New Connections (ERU's)	140	140	140	100	50	50
Ratepaying ERU's	4,396	4,536	4,676	4,816	4,916	4,966
Growth Percentage	3.5%	3.5%	3.5%	2.0%	1.0%	1.0%
Connection Fee	**$7,266**	**$7,266**	**$7,266**	**$7,266**	**$7,266**	**$7,266**
Annual Cost Escalation		3.0%	3.0%	3.5%	3.5%	3.5%
Investment Interest		1.0%	1.0%	1.0%	1.0%	1.0%
Single Family Monthly Rate = $37.75	**$41.75**	**$41.75**	**$45.75**	**$45.75**	**$47.75**	**$47.75**

Key Assumptions:

New Connections - The new connections were estimated by the City with knowledge of current activity and considered timing of the sewer moratorium removal.

Ratepaying ERU's – The total billing ERU's at the end of 2004 was 4,161. It was assumed that the multi-family rates would be the same per unit as single family based on the current design with individual laundries, more bathrooms, etc. It was also assumed that a discount for low-income senior customers would be introduced. The combination added an estimated 235 ERU's for 2005. The Council expanded the discount to include low-income disabled customers.

Growth Percentage – This approximation is used as a factor to increase future maintenance, operations and equipment replacement costs to reflect the larger ratepayer base requiring service.

Connection Fee – The General Facilities Charge adopted by the Council in 2005 to support the new customers share of debt on the capital program and is an increase from the $5,300.

Annual Cost Escalation – This factor is used to increase certain costs in the future to reflect the general inflation in the dollar.

Investment Interest – This factor is used to estimate interest earnings on the fund balances invested by the sewer utility funds.

Single Family Monthly Rate – This line shows the anticipated monthly rate for single family in the six-year financial plan. The Council adopted the rates for only the first three years: 2005-2007.

Table 10-7 shows the six-year financial plan for the sewer operating fund 401. The financial plan differentiates between operating and capital sources and uses of the funds. Operating revenue is used to pay for operations, on-going capital outlay to be paid from rates and debt. Any surplus is then available for capital. Capital revenue sources are added to reflect the total annual amount available for capital improvements in each year. The remainder is either added to reserves, or reduces reserves available for the future.

Table 10-7
City of Sedro-Woolley
Six-Year Financial Plan/ Sewer Fund 401

SIX-YEAR FINANCIAL PLAN	Dr. Bdgt.	Projected				
SEWER FUND 401	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Operating Revenue						
Sewer Service Charges	1,885,000	2,054,900	2,118,300	2,181,700	2,227,000	2,249,700
Additional from Multi & Senior Discount	62,099					
Additional from Rate Increase	129,668	217,728	442,176	442,176	560,160	560,160
Investment Interest	20,000	10,900	13,600	15,900	15,000	14,300
Late Penalties & Interest	1,500	1,500	1,500	1,500	1,500	1,500
Subtotal Operating Revenue	2,098,267	2,285,028	2,575,576	2,641,276	2,803,660	2,825,660
Operating Expenditures						
Maintenance	214,000	228,135	243,203	256,749	268,393	280,565
Additional Staff (2/5 FTE)	10,400	21,424	22,067	22,839	23,638	24,466
General Operations	875,095	932,895	994,513	1,049,907	1,097,520	1,147,293
Admin Charge – Transfer to 001	111,000	114,330	117,760	121,881	126,147	130,563
Equip Replacement Fund - Transfer to	118,620	126,455	134,807	142,316	148,770	155,517
Capital Outlay from Rates						
Buildings & Structures	10,000	10,000	10,000	10,000	10,000	10,000
Portable Equipment	31,500	30,000	30,000	30,000	30,000	30,000
Professional Services	118,000	100,000	100,000	100,000	100,000	100,000
WWTP Machinery/Equipment	125,000	125,000	125,000	125,000	125,000	125,000
Subtotal Operating	1,613,615	1,688,239	1,777,350	1,858,693	1,929,469	2,003,403
Operating Surplus (Deficit)	**484,652**	**596,789**	**798,226**	**782,583**	**874,191**	**822,257**
Debt Service						
1998 Revenue Bond - Transfer to 407	250,000	250,000	250,000	250,000	250,000	250,000
New Loan Payment for CIP		85,500	595,000	613,000	522,921	525,921
Subtotal Debt Service	250,000	335,500	845,000	863,000	772,921	775,921
Net Available for Capital	234,652	261,289	(46,774)	(80,417)	101,270	46,336
Other Capital Revenue						
Grant fr. Skagit Co.	445,750					
Proceeds from New Loans for CIP		8,550,000		2,000,000		268,000
Transfer from Fund 410	1,000,000	1,140,362	777,340	486,700	123,400	123,400
Total Available For Capital	1,680,402	9,951,651	730,566	2,406,283	224,670	437,736
Capital Improvements						
Retainage for Completed Projects	51,385					
Capital Outlay Identified in Plan 6A-6H	50,000	54,080	134,984	169,629	194,664	202,451
Capital Improvement Program	2,690,750	9,520,736	269,967	2,223,375		496,781
Total Capital Improvements	2,792,135	9,574,816	404,951	2,393,004	194,664	699,232
Annual Surplus (Deficit)	**(1,111,733)**	**376,835**	**325,616**	**13,278**	**30,005**	**(261,496)**
Beginning Fund Balance	**2,199,452**	**987,719**	**1,264,554**	**1,490,170**	**1,403,448**	**1,333,454**
Designated for Sewer Plant Equip	100,000	100,000	100,000	100,000	100,000	100,000
Ending Fund 401 Balance	**987,719**	**1,264,554**	**1,490,170**	**1,403,448**	**1,333,454**	**971,958**

The operating revenue and expenditures seem quite clear in Table 10-7. However, several of the lines in the capital section should be highlighted for the City's clear understanding in moving forward.

New Loan Payment for CIP – This loan payment assumes a 1% interest rate on PWTF loans.

Grant from Skagit County – This grant is for a portion of the SR20 phased work.

Proceeds from New Loans for CIP – The previous table with funding sources indicates that the amount to be borrowed in the 2006 PWTF loan would be $9,500,000 under the assumption that the work underway in 2005 is a phase of the project to be completed with the 2006 loan. In order to be conservative in this six-year financial plan, it is shown that 90% of the $9,500,000 (10% local match) would be available for capital revenue. The 2008 and 2010 loans also assume a 10% local match.

Transfer from Fund 410 – It is assumed that the annual connection fee receipts will be used in full for either debt or capital projects. First priority will be the annual transfer to the bond fund for $250,000 payment on the sewer treatment plant bonds, and the remainder will be transferred to the sewer fund for capital projects or new PWTF debt repayment. The 2005 budget included a $1,000,000 transfer. The projections for 2006 include the remaining current activity plus $200,000 from the fund balance to go toward the 10% local match on the 2006 loan.

Ending Fund 401 Balance – This shows the projected ending balance in each year based on the assumptions included in this scenario.

Table 10-8
City of Sedro-Woolley
Cumulative Reserve/Sewer Facilities Fund 410

SIX-YEAR FINANCIAL PLAN	**Dr. Bdgt**	**Projected**				
CUM RES/SWR FACIL FUND 410	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Revenue						
Investment Interest	10,000	12,100	10,100	10,100	10,100	10,100
Special Sewer Connections	161,022	161,022				
Sewer Connection Fee	750,000	1,017,240	1,017,240	726,600	363,300	363,300
Subtotal Revenue	**921,022**	**1,190,362**	**1,027,340**	**736,700**	**373,400**	**373,400**
Expenditures						
Xfer to Sewer Fund 401 Capital Proj	1,000,000	1,140,362	777,340	486,700	123,400	123,400
Xfer to Sewer Fund 407 Bond Pymnt	250,000	250,000	250,000	250,000	250,000	250,000
Subtotal Expenditures	**1,250,000**	**1,390,362**	**1,027,340**	**736,700**	**373,400**	**373,400**
Annual Surplus (Deficit)	**(328,978)**	**(200,000)**				
Beginning Fund Balance	1,539,281	1,210,303	1,010,303	1,010,303	1,010,303	1,010,303
Ending Fund 410 Balance	**1,210,303**	**1,010,303**	**1,010,303**	**1,010,303**	**1,010,303**	**1,010,303**

The ending 410 balance has not been further assigned to allow a reserve to follow through with the debt service payments on the treatment plant bonds should sewer connections be slower than anticipated. This same reserve would allow the City flexibility in completing its future capital projects should the costs be higher than anticipated.

10.9 SEWER RATES

Monthly sewer rates and charges were raised effective May 1, 2005 based on the three-year plan in this section. The ordinance contains a three-year schedule for increasing rates to help ensure that the plan can be carried out. This is to be reviewed before the end of the three-year period and if the City were to borrow any further monies.

Table 10-9
City of Sedro-Woolley
Schedule of Monthly Sewer Rates

Monthly Rate by Customer Class:	May 1, 2005	Jan. 1, 2007
Single Family	$41.75	$45.75
Low-Income Senior/Disabled	$37.75	*
Multiple Residential Unit	$41.75	$45.75
Nonresidential Monthly Base Rate (includes 750 cubic feet per mo.)	$41.75	$45.75
Nonresidential Monthly Volume Rate (over 750 cubic feet per mo.)	$3.20 per 100 cubic feet	$3.55 per 100 cubic feet

*The City Council did introduce a low-income senior/disabled rate with this rate adjustment. The previous single-family rate of $37.75 was held constant for qualified low-income senior/disabled homeowners that are within the annual income limit of $35,000 set by the County. The final rate ordinance expanded the discount to include low-income disabled homeowners qualifying for the County's property tax exemption. While the rate ordinance did not set an increase for this customer class for 2007, it is anticipated that a review will be completed and the rate adjusted in line with other rates such that the maximum discount would be 20%. The proposed rate had been $40.75.

10.10 SEWER FACILITIES CHARGE – CONNECTION FEE

New connections to the sewer system pay a Sewer Facilities Charge of $7,266 per residential unit or residential equivalent unit for non-residential connections, as adopted by the Council in March 2005. This calculation is based on the balanced financial plan to carry out the capital improvements, support a reasonable share of the anticipated debt plus the $1,650 toward repayment of the outstanding treatment plant bonds.

Several alternatives were evaluated in detail with the Council. In evaluating the alternatives, the Council attempted to balance the desire for economic development activity within the City,

together with the need for significant capital investment to remove the sewer moratorium and considered the impact on existing customer's monthly rates. The alternative selected did the best overall job of balancing.

The City has been discussing a program to provide incentive for existing septic users to convert to the sanitary sewer system when it becomes available. These homeowners may request a waiver when a new line is installed in the vicinity if their septic system is meeting requirements. The program would be designed to provide incentive for these same homeowners to convert to the sewer system as it becomes available to promote overall water quality within the City.

As connection fees increase, some communities begin discussing programs that would allow individual homeowners to pay their facilities charge over a period of time, with interest. Typically these are targeted at individual homes and would not apply to new development that is required to connect new homes to the sewer system. While this is attractive, it is important for the City to consider the impacts on the overall financial plan and ability to support the debt and carry out the capital improvements identified before adopting such an adjustment.

10.11 COMPARISON TO OTHER JURISDICTIONS

While it is interesting to compare to what other jurisdictions are charging for sewer service and new connections, it is important to understand that Sedro-Woolley is developing its financial plan to carry out the projects and maintenance level required for its own system.

A comparison of single family monthly sewer rates and facilities charges for new connections is shown in Table 10-10. This research was last updated in late 2004/early 2005 and reflects the monthly rate for 800 cubic feet of usage. While some rate structures vary by volume, most common is a flat rate for residential.

Table 10-10
City of Sedro-Woolley
Comparison to Other Jurisdictions

Single Family Customer Rates & Charges
(5/8" Meter @ 800 cf per month)

Jurisdiction	Monthly Sewer Rate	Sewer Facilities Charge
Sedro-Woolley	$41.75	$7,266
Anacortes	$42.87	$4,080
Arlington	$35.40	$2,700
Burlington	$39.55	$3,754
Duvall	$54.45	$7,647
Lake Stevens	$40.00	$6,363
Marysville	$28.40	$4,490
Monroe	$41.15	$5,912
Mt. Vernon	$37.77	$2,700
Sultan	$46.00	$7,983

Note - The City of Arlington is in the process of updating its sewer comprehensive plan and will be studying rates and connection charges based on the recommendations of its planning process.

10.12 SUMMARY RECOMMENDATIONS

The City Council has taken action on the recommendations in the financial plan by passing the rate and fee ordinances. A summary of the actions follows:

- Increased the Sewer Facilities Charge to $7,266 for new connections to the sewer system.

- Increased multi-family per unit rates to be the same as single family to reflect the newer style of multiple units that are very similar to single family units.

- Introduced a low-income senior/disabled sewer rate for qualified homeowners. The program was expanded to include low-income disabled homeowners after the projections were developed. The rate ordinance did not include an increase in 2007 for this customer class. It is anticipated that this will be reviewed and the rate adjusted in 2007 in line with other rates, up to a maximum of 20% discount.

- Adopted a three-year rate schedule to ensure that the loan repayments could be made for the anticipated 2006 PWTF loan.

- Monitor the rate outlook – the rate outlook should be reviewed annually with the budget process. A rate study should be completed to update the future projections in 2007 and before any additional borrowing is done. The financial plan includes assumptions on the number of new customers paying the connection fee and paying monthly rates. The future rates may be impacted by any one of the assumptions being slowed.

- Understand the risk in this plan – the PWTF construction loan process is on an annual cycle. If the project does not rank high enough to get on the 2006 list, the City will have to re-evaluate the financial plan. The City could sell bonds to have the construction financing available in the 2006 construction season. An additional rate increase will likely be necessary before selling the bonds. The interest rates may be higher than they are this year. Another option would be for the City to pursue Department of Ecology funds in November of 2005, with the funds being available later in 2006.