ORDINANCE NO. 5465

AN ORDINANCE AMENDING ORDINANCE NO. 4447, WHICH ADOPTED THE CITY OF ALBANY COMPREHENSIVE PLAN; ADOPTING FINDINGS; AND DECLARING AN EMERGENCY.

WHEREAS, in June 1998, the City of Albany and consultants CH2M Hill, Inc. completed an update to the Albany Wastewater Facility Plan; and

WHEREAS, a Wastewater Task Force, appointed by Mayor Chuck McLaran, reviewed the Wastewater Facility Plan and developed a financial plan to fund recommended improvements; and

WHEREAS, in January 2000, the findings of the Wastewater Task Force were presented to the City Council; and

WHEREAS, on September 11, 2000, the Albany Planning Commission held a public hearing on adoption of the Albany Wastewater Facility Plan Summary as a supporting document to the Comprehensive Plan, and other amendments to the Plan that will implement the Wastewater Facility Plan; and

WHEREAS, the Planning Commission recommended the City Council adopt the proposed amendments to the Comprehensive Plan; and

WHEREAS, the City Council held a public hearing on the proposed amendments on September 27, 2000;

NOW THEREFORE, THE PEOPLE OF THE CITY OF ALBANY DO ORDAIN AS FOLLOWS:

Section 1: The findings and conclusions included in the written staff report to the City Council for their September 27, 2000 meeting are hereby adopted in support of the decision to adopt the amendments to the Comprehensive Plan described above. The findings and conclusions are attached as Exhibit A. *(Note to City Council: The findings and conclusions will be attached to the ordinance as Exhibit A in the City records, replacing the Mayor's Wastewater Task Force Report (currently Exhibit A), which does not have to be part of the ordinance.)*

Section 2: The Albany Wastewater Facility Plan Summary is adopted as a supporting document to the Albany Comprehensive Plan. The Summary is attached as Exhibit B.

Section 3: The text of Comprehensive Plan Goal 11: Public Facilities and Services included in the Plan is amended by deleting old text and adding new text, as shown in attached Exhibit C.

Section 4: The text of Comprehensive Plan Appendix VI is amended by deleting text as shown on attached Exhibit D.

Section 5: Inasmuch as this ordinance is necessary for the immediate preservation of the public peace, health, and safety of the city of Albany, an emergency is hereby declared to exist; and this ordinance shall take effect immediately upon passage by the Council and approval by the Mayor.

Passed by Council: September 27, 2000
Approved by Mayor: September 27, 2000
Effective Date: September 27, 2000

Mayor

ATTEST:

City Clerk

ORD. 5465

STAFF ANALYSIS
Comprehensive File CP-03-00

The Albany Development Code contains the following review criteria that must be met for this legislative Comprehensive Plan amendment to be approved. Code criteria are written in ***bold italics*** and are followed by findings and conclusions.

(1) A legislative amendment is consistent with the goals and policies of the Comprehensive Plan, the statewide planning goals, and any relevant area plans adopted by the City Council.

FINDINGS

1.1 The proposed Comprehensive Plan amendments would:

a. Adopt the *Albany Wastewater Facility Plan Summary* as a supporting document to the Comprehensive Plan
b. Amend the text of Goal 11 of the Comprehensive Plan
c. Amend Comprehensive Plan Appendix VI (a list of proposed improvement projects)

1.2 The following Comprehensive Plan goals and policies are relevant to the proposed amendments.

Goal 11: Provide and maintain wastewater facilities and services in an orderly and efficient manner.

Policy 1: Size sanitary sewers to provide for projected growth within the Urban Growth Boundary based upon the population projections and land use designations of the Comprehensive Plan and completion of the design guidelines of the Public Facilities Plan.

Policy 7: Periodically review the sewer revenues and maintain a fee schedule which ensures that the revenues generated are adequate to meet operating and maintenance costs and implement those projects identified.

Policy 8: Continue to develop specific plans and funding mechanisms for expansion of the wastewater treatment plant which includes proposed resolution of domestic wastewater treatment for the City of Millersburg, North Albany, and other expanding areas of the Urban Growth Boundary.

Policy 12: Continue a program for eliminating direct discharge and infiltration of storm and groundwater into the sanitary sewer system.

Policy 13: Explore sludge disposal options that:
a. Are cost effective and environmentally sound.
b. Provide viable long-term disposal opportunities.
c. Make productive use of sludge.

1.3 The proposed amendments would adopt the *Albany Wastewater Facility Plan Summary* as a supporting document to the Comprehensive Plan. The *Summary* is based on the *Albany Wastewater Facility Plan* completed by CH2M Hill, Inc., and recommendations of the Mayor's Wastewater Task Force. The *Summary* describes how wastewater services will be provided within Albany's Urban Growth Boundary over the next 20 years. The recommended system improvements are based on population projections and land use designations included in the Comprehensive Plan, updated and supplemented by more recent population projections.

1.4 Section 1 of the *Summary* recommends administrative policies for provision of wastewater services. Section 2 of the *Summary* includes a description and evaluation of the current capacity of the City's wastewater treatment plant and collection system. Population projections and future wastewater forecasts are included in Section 3 of the *Summary*. Section 4 of the *Summary* describes the regulatory environment and operating requirements over the planning period. Section 5 of the *Summary* describes alternative improvement strategies considered in the *Albany Wastewater Facility Plan* and Section 6 describes the recommended improvements. Section 7 of the *Summary* describes the recommended implementation schedule for construction of these improvements.

1.5 One of the purposes of the Wastewater Facility Plan was to identify needed improvement projects, so that costs could be estimated and wastewater-related fees adjusted to assure that an adequate amount of revenue will be collected to construct the improvements. A Wastewater Task Force, appointed by the Mayor, recommended methods of financing projected capital, debt, and operation and maintenance expenses through 2010.

The *Summary* consolidates the findings and recommendations of the *Albany Wastewater Facility Plan* and coordinates these with Task Force recommendations used in development of a long term financial plan for the wastewater system.

1.6 Section 2 of the *Summary* includes a description and evaluation of the current capacity of the City's wastewater treatment plant and collection system.

1.7 Section 3 of the *Summary* projects the amount of storm and groundwater that will infiltrate into the sanitary sewer system in gallons per acre per day. Section 6 includes a description of a "perpetual life replacement program" that will replace sewer lines, thereby reducing the amount of infiltration of groundwater and storm water into the sanitary sewer system.

1.8 Section 2 of the *Summary* identifies inadequate biosolids storage as a deficiency of the wastewater treatment system. Section 6 summarizes the findings of the Wastewater Facility Plan about dealing with biosolids from the Wastewater Treatment Plant. Dewatered cake was found to be the most cost effective method of processing and disposing of biosolids from the plant. A biosolids dewatering and storage facility that will produce and store dewatered cake from treatment plant effluent is currently under construction.

1.9 The following statewide planning goals are relevant to the proposed amendments.

Goal 11: To plan and develop a timely, orderly, efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

The proposed amendments will update Goal 11, Public Facilities, of the Albany Comprehensive Plan. Goal 11 has not been updated since the last periodic review of the Plan was finished in 1989. The City of Albany hired the consulting engineering firm of CH2M Hill, Inc. to update the community's Wastewater Facility Plan. The Plan was finished in 1998. A Wastewater Task Force reviewed the Wastewater Facility Plan, developed funding recommendations and presented these to the City Council in January 2000.

The Wastewater Facility Plan was updated in response to growth within the community, new environmental regulations, and changes in land use planning and development. The Plan focuses on collection system improvements, wastewater treatment system improvements, and sludge (biosolids) handling and storage improvements. The overall goal of the Plan is to provide an updated comprehensive wastewater facility plan that meets the community's wastewater collection and treatment needs for the next 20 years.

The Wastewater Facility Plan covers the Albany Urban Growth Boundary (UGB). It also covers the Millersburg UGB because Albany's wastewater treatment plant treats non-process (domestic) wastewater from Millersburg. The planning period covered by the Plan is 1998 through 2020.

The consultant used new information provided by the City, including updated population projections and better projections of future development density and location, to forecast future system demands. The population projections that were used are the same as those used in the City's *Transportation System Plan* (TSP) adopted in August 1997.

Staff prepared a summary of the *Albany Wastewater Facility Plan* following completion of the Plan and the Wastewater Task Force's recommendations to City Council. The *Summary* includes highlights of the Wastewater Facility Plan and incorporates recommendations of the Task Force concerning the construction schedule and adoption of a perpetual life replacement program. In June 2000, the City Council adopted the 10-year schedule of fees and rates recommended by the Task Force.

1.10 The Wastewater Facility Plan is consistent with the East I-5 Infrastructure Plan prepared for the City by CH2M Hill in 1995.

CONCLUSIONS

1.1 This criterion is met because the proposed amendments are consistent with relevant goals and policies of the Comprehensive Plan and statewide planning goals and the East I-5 Infrastructure Plan.

(2) A legislative amendment is needed to meet changing conditions or new laws.

FINDINGS

2.1 As discussed under Finding of Fact 1.9 above, the Wastewater Facility Plan was updated in response to growth within the community, new environmental regulations, and changes in land use planning and development.

2.2 In Section 4 of the *Summary*, current and proposed regulations of the U.S. Environmental Protection Agency (EPA), and the State of Oregon Department of Environmental Quality (DEQ) were reviewed and summarized to establish design criteria for the development of necessary wastewater collection, treatment, and disposal alternatives. The review included secondary treatment regulations, Willamette River basin water quality standards and guidelines, biosolids management criteria, and reliability and redundancy criteria.

CONCLUSIONS

2.1 This criterion is met because the proposed amendments are needed to meet changing conditions and new laws.

EXHIBIT

Mayor's Wastewater Task Force Report

January, 2000

Albany Public Works Department
Utility Management Workgroup

Executive Summary

Summary of Findings and Recommendations

Since August 1998, the Mayor's Wastewater Task Force has been reviewing the needs of the City's wastewater system and working to develop a plan to fund the necessary capital improvements and annual operation and maintenance expenses through 2010. The Task Force's key finding is that Albany needs to make a substantial investment in its wastewater system and that the improvements need to be funded through a combination of sewer rates and system development charges (SDCs).

Task Force Mission

"Provide the City Council with a community-supported, equitable financing plan that meets regulatory requirements and growth demands."

Task Force Process

The Wastewater Task Force held 18 public meetings to receive information from City staff, financial consultants, and members of the public concerning the needs of the wastewater system and options for financing improvements.

The Task Force met jointly with the City Council on September 13, 1999, to review current regulatory requirements and discuss implications of these requirements with the City's legal consultant. The Task Force also held two community forums, one for the general public on September 28, 1999, and one with the Albany Chamber of Commerce on October 14, 1999.

Individual Task Force members also served as liaisons with ratepayer groups that they represented. In addition, the Task Force published various informational articles in the *City Bridges* newsletter, worked with the *Albany Democrat-Herald* to present the material to the general public through the newspaper, and posted information about the meetings and the Task Force work on the City's web site (*www.ci.albany.or.us*).

Task Force Findings

System Needs

1. In June 1998, a Wastewater Facility Plan was finalized by CH2M-Hill, an independent engineering consultant. The consultant evaluated the City's existing wastewater system and identified over $70 million (1997 dollars) in improvements necessary to meet regulatory requirements and growth demands for the next 20 years.

2. The City of Albany is not currently meeting regulatory requirements associated with sanitary sewer overflows (SSOs). Oregon Department of Environmental Quality (DEQ) regulations require overflows of untreated sewage to the Willamette and Calapooia Rivers be reduced by 2010 to a level that meets the regulatory standards.

3. Portions of the City's sewer pipe system are nearly 100 years old and the City has not been able to replace worn-out portions of the system in a timely manner.

4. The City's limited ability to provide storage for digested sewage sludge does not allow the City to comply with DEQ recommendations regarding land application of sludge during wet weather periods.

5. The improvements required for upgrading the City's wastewater system are primarily driven by existing system deficiencies and DEQ regulations. Most of the required improvements would be mandatory regardless of future growth in Albany. However, when planning to meet these existing demands, it is prudent to also provide capacity for expected growth.

6. There are substantial legal and financial consequences of not moving forward with the required improvements to the treatment plant and sewer system. The City could face fines of up to $25,000 per day per violation for failing to satisfy wastewater discharge permit requirements or water quality standards. In addition to these fines, the City could be subject to third-party lawsuits and financial penalties for not meeting environmental regulations.

7. Cities throughout the Willamette Valley are being required to make comparable investments in their wastewater systems to comply with environmental regulations. Other cities have already imposed substantial sewer rate increases or are also facing major increases to build the required improvements.

Funding

1. There are no state or federal grant programs available to pay for or assist in funding wastewater system needs through 2010; therefore, the City must rely on locally-generated revenues from rates and SDCs to fund the wastewater system needs.

2. Annual revenue increases of 11 percent per year are needed to meet projected wastewater system costs over the next 10 years.

3. Revenue bonds provide the most equitable means of users sharing the costs of making improvements to the wastewater system.

System Development Charges

1. The existing system has limited reserve capacity available. Consistent with state law, a reimbursement fee can be charged to new development to recover existing customer's investments in this capacity. For the planning period through 2020, many of the capital improvements recommended in the 1998 Wastewater Facility Plan will provide additional capacity to meet future demands. Therefore, it is appropriate to charge an improvement fee to fund growth-related costs.

2. The value of the existing system is adjusted to allow for inflation and to recognize the change in the value of the dollar since the original system was built.

3. A debt service credit is appropriate to avoid double charging new customers for future debt-financed improvements paid for through both SDCs and rates.

4. The current SDC structure does not recognize higher strength wastewater loads for commercial customers.

Rates

1. The current sewer customer classification system is overly complex and does not allow for adequate differentiation among commercial customers for sewer strengths.

2. The current sewer rate schedule would not distribute future costs and capital expenditures equitably among residential, commercial, and industrial customer classes.

3. The current rate structure limits customers' ability to control their sewer bill because a large portion of the bill is a fixed charge.

Task Force Recommendations

System Needs

1. Construct improvements, identified in the Wastewater Facility Plan as adopted, that are needed to meet regulatory requirements and accommodate growth. In addition, the Task Force concluded that it is the community's obligation to provide responsible environmental stewardship of our community's water quality.

2. Invest $1 million per year in a sewer pipe replacement program funded through sewer rates. Replacement at this initial level of investment will result in a 190-year replacement cycle. As current and future debt obligations are retired, dedicate existing and future debt service payments to the Perpetual Life Replacement program to fully fund replacement of the sewer system on a 100-year cycle.

3. Budget $500,000 for repair and replacement of existing facilities at the Wastewater Treatment Plant until new facilities are constructed.

4. Wastewater Facility Plan improvements to the Wastewater Treatment Plant should be constructed as a single phase improvement to provide the greatest water quality benefits, minimize disruption to the Treatment Plant and result in the least cost to ratepayers.

Funding

1. Use available capital reserves and future revenue bonds to fund the wastewater system improvements needed through 2010. Repay the bonds using a combination of rate and SDC revenue.

2. System development charges should reflect the full costs of growth-related capacity so that growth pays its proportional share.

3. To meet the 11 percent per year revenue increase, rely on 2 percent annual growth in the number of customers and a 9 percent annual increase in rates.

4. Continue to look for and pursue funding assistance from state and federal agencies.

System Development Charges

1. Adopt the SDC fees presented in Table ES-1, effective July 1, 2000. The SDCs presented in Table ES-1 represent the maximum-allowable fees (based on the methodologies and assumptions used in the analysis) and, therefore, are appropriate for growth to pay its proportional share. In addition, the SDCs presented in Table ES-1 are designed to recognize wastewater strength from commercial customers.

2. Update SDCs annually (if needed) based on changes in the Engineering News Record (ENR) construction cost index for Seattle.

3. Adopt the five-year average SDC Debt Service Credit per EDU established herein. Because the credit reflects an average calculated credit for the next five years, it should not be adjusted by the ENR index, but should be reevaluated in FY 2004-2005.

4. Complete negotiations with the City of Millersburg to recover a proportionate share of treatment plant capacity expenses. These negotiations should be based on unit cost of capacity values presented in Table 4-2.

Rates

1. Adopt a new customer classification system that reduces the number of customer classes from 11 to 6 and allows for recognition of sewer strength differences among all commercial customers.

2. Reduce the portion of the total revenue recovered through the fixed charge in the rate structure to allow more customer control over sewer bills. The variable portion will be increased.

3. Adopt the five-year, rate transition plan to cost-of-service rates shown in Table ES-3, effective July 1, 2000.

Implementation

1. Adopt the Wastewater Facility Plan.

2. Adopt new rates and SDCs effective July 1, 2000.

3. Implement monthly billing for all customers to replace current quarterly billing system.

4. Review the funding plan annually to track actual revenues and expenditures against those projected in the financial plan.

5. Develop an administrative process for customers to appeal classification assignments.

6. Review cost of service and rate structure every five years, or when there is a major change in system costs or customers.

7. Develop a system to track commercial customer changes for sewer rate classification purposes.

Proposed SDC / Rate Plan

SDC Fees

The Task Force recommends that the City Council update the fee structure and methodology used to determine Sewer Systems Development Charges (SDCs) effective July 1, 2000. Specific changes are summarized below and discussed in greater detail with the text and supporting appendices of this report. The Task Force recommends that the City Council adopt updated SDC fees based on the fee structure summarized below and discussed in greater detail in Section 4 of this report.

TABLE ES-1
COMPARISON OF PROPOSED SDCS (effective July 1, 2000) TO EXISTING SDCS

Customer Class[1]	Existing SDC		Proposed SDC	
	Base	Per + Fixture[2]	Base	Per + Fixture[2]
Residential	$1,329	(na)	$1,971	(na)
Commercial				
Low	$1,329	$222	$1,971	$329
Medium	$1,329	$222	$2,871	$479
High	$1,329	$222	$4,595	$766
Industrial	Unit costs applied to individual customers' flow/strength			

[1] Based on proposed customer classes
[2] Unit cost for each fixture above the 6 fixtures included in the base charge

Rates

Adoption of updated cost-of-service user rates is needed to ensure that user rates fairly distribute the costs of future improvements based upon use of the services. Once fully implemented, updated cost-of-service rates will result in a shift of revenue responsibility among customer classes. This shift is summarized below in Table ES-2 and is more fully discussed in Section 5 of this report.

TABLE ES-2
CUSTOMER CLASS REVENUE RESPONSIBILITY

Customer Class	Existing Share	Proposed Share
Residential	70%	65%
Commercial		
Low	8%	9%
Medium	9%	11%
High	2%	4%
Industrial	6%	7%
Millersburg	5%	4%
Total	100%	100%

For all but the grocery and restaurant classifications, the Task Force recommends that updated cost-of-service rates be phased in over a five-year period to buffer the impact of rate increases to medium- and high-strength commercial customers. The Task Force recommends that the transition period for existing customers in current restaurant and grocery classifications be extended to eight years to buffer increases that customers in these former rate classes would experience over a five-year period. This eight-year transition applies only to those customers in the restaurant or grocery store

classification at the time of this report. New restaurant or grocery store customers will pay the standard transition rates for medium- or high-strength classifications.

TABLE ES-3
PROPOSED MONTHLY TRANSITION RATE SCHEDULE

	Fiscal Year (effective July 1)				
Customer Class	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**2004-05**
Fixed Charges					
Residential	$12.848	$13.785	$14.787	$15.858	$17.001
Commercial					
Low	1.400	1.554	1.725	1.913	2.122
Medium	4.755	5.470	6.277	7.188	8.205
Restaurants	4.755	5.470	6.277	7.188	8.205
High	3.863	4.992	6.290	7.778	9.483
Grocery Stores	3.863	4.992	6.290	7.778	9.483
Volume Rates ($/Ccf)[1]					
Residential	$0.905	$0.972	$1.042	$1.118	$1.198
Commercial					
Low	2.227	2.471	2.742	3.042	3.374
Medium	2.488	2.863	3.285	3.761	4.294
Restaurants	3.037	3.037	3.250	3.500	3.880
High	2.825	3.665	4.634	5.747	7.023
Grocery Stores	4.306	4.306	4.630	5.260	5.800
Industrial Unit Charges					
Flow ($/Ccf)[1]	$0.704	$0.920	$1.179	$1.487	$1.670
Biochemical Oxygen Demand (BOD) ($/lb.)	0.381	0.394	0.406	0.418	0.430
Total Suspended Solids (TSS) ($/lb.)	0.356	0.402	0.454	0.511	0.575

[1] Ccf = one hundred cubic feet or approximately 750 gallons

Proposed Schedule

TABLE ES-4
PROPOSED SCHEDULE TO ADOPT RATE AND SDC CHANGES

	Timing
Present Task Force Recommendations to City Council	January 2000
Hold Public Hearing to Accept Plan, Adopt Updated User Rate Changes	February 2000
Prepare Sewer SDC Methodology	March 2000
Provide Public Notice of SDC Methodology Update	March 2000
Hold Public Hearing to Adopt SDC Methodology and Fees	May 2000
Updated User Rates and SDC Fees Effective	July 2000

EXHIBIT B

ALBANY

WASTEWATER

FACILITY PLAN

SUMMARY

AUGUST 2000

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GLOSSARY

AD	Average Day
BOD_5	Five day Biochemical Oxygen Demand
$CBOD_5$	Five day Carbonaceous Biological Oxygen Demand
CH2M Hill	CH2M Hill, Inc.
CIP	Capital Improvement Program
CWA	Clean Water Act
DAF	Dissolved Air Floatation (to concentrate biosolids)
DEQ	State Department of Environmental Quality
DO	Dissolved Oxygen
DWAD	Dry Weather Average Day
FC	Fecal coliform
EPA	Environmental Protection Agency
EQC	Oregon Environmental Quality Commission
GPAD	Gallons per acre per day
GPCD	Gallons per capita per day
GPED	Gallons per employee per day
gpm	Gallons per minute
I&C	Instrumentation and Controls
I/I	Infiltration and Inflow
KHA	Kimley-Horn and Associates, Inc.
lbs./day	Pounds per day
MGD	Million gallons per day
mg/L	Milligrams per liter
MM	Maximum Month
MMADF	Maximum Month Average Day Flow
NH_3-N	Ammonia nitrogen
NPDES	National Pollution Discharge Elimination System
OAR	Oregon Administrative Rules
P	Phosphorus
pH	Numerical measure of acidity or alkalinity
PI	Peak instantaneous
PWD	Public Works Director for the City of Albany or his/her authorized designee
SDC	System Development Charges
Task Force	Mayor's Wastewater Advisory Task Force
TKN	Total Kjeldahl nitrogen
TPO_4	Total phosphorus
TSS	Total Suspended Solids
UGB	Urban Growth Boundary
RAS	Return Activated Sludge
Wastewater Facility Plan	1998 Wastewater Facility Plan, CH2M Hill, as amended
WAS	Waste Activated Sludge
WW	Wet Weather
WWTP	Wastewater Treatment Plant

Section 1
Overview

Background

This report summarizes the 1998 Wastewater Facility Plan completed by CH2M Hill and a follow-up financial plan prepared by the Mayor's Wastewater Advisory Task Force. The City of Albany, Oregon, and consultant CH2M Hill, Inc. (CH2M Hill) completed an update to the community's Wastewater Facility Plan in June 1998. In August 1998 a Wastewater Task Force (Task Force), appointed by Mayor Chuck McLaran, began a review of the Wastewater Facility Plan and development of a financial plan to equitably fund recommended improvements. The financial plan was completed with the help of Galardi Consulting, LLC. The Task Force completed their work in January 2000 and presented their recommended financial plan to the City Council at the January 26, 2000, Council meeting.

Wastewater Facility Plan

The Wastewater Facility Plan process began with an evaluation of the existing wastewater system and the current regulatory environment. The Plan evaluates the existing wastewater system within Albany's Urban Growth Boundary (UGB), including sanitary sewer pipelines, pump stations, and treatment facilities and identifies projects needed to address current deficiencies and future wastewater capacity requirements. In addition to the area within the UGB, the Wastewater Facility Plan study area also includes domestic (non-process) wastewater flows from the City of Millersburg.

Existing requirements and future system capacity demands were identified and alternative projects needed to address these conditions were evaluated. The Wastewater Facility Plan includes the list of projects identified to meet these needs. In addition to the biosolids dewatering and cake storage facility now under construction, it is estimated that $63.5 million (1997 dollars) will be needed over the next 10 years for wastewater treatment and collection system improvements.

Financial Plan

Task Force members were selected to provide a diverse and representative set of viewpoints. The Task Force included residential, commercial, and industrial customer representatives, a member of the Willamette Valley Homebuilding Association, and a City Council representative. The Task Force provided direction for the financial study and served as a link to the public for review of wastewater system needs. Task Force meetings were open to the public and were held from August 1998 through January 2000. The public was invited to attend two forums to discuss Task Force recommendations concerning user rates and System Development Charge (SDC) fees. One forum was sponsored solely by the Task Force and focused on residential customers, and a second forum was co-sponsored with the Albany Chamber of Commerce and focused on rate and SDC impacts for commercial and industrial customers.

The Task Force recommended methods of financing projected capital, debt, and operation and maintenance expenses through 2010 through two primary funding sources, sewer user rates and sewer SDC fees. The Task Force also recommended that the Wastewater Facility Plan be amended to change the schedule for construction of recommended improvements and to adopt a perpetual life replacement program for the sewer collection system. This summary document reflects the Task Force's recommendations. Initial projects focus on the wastewater collection system to minimize wastewater overflows to the Calapooia River, followed by a single-phase improvement to the Wastewater Treatment Plant beginning in the spring of 2007. Phasing projects in this fashion results in immediate water quality benefits where deemed to be the most needed, provides significant savings to rate payers, and minimizes disruptions to the Wastewater Treatment Plant and surrounding neighborhood. Descriptions of proposed projects and a construction schedule are included in later sections of this report.

Administrative Policies

The following policy statements are based on results, conclusions, and recommendations of the Albany Wastewater Facility Plan and the Mayor's Wastewater Task Force Report:

Engineering Criteria

It shall be the policy of the City to follow the engineering planning criteria for lift stations, sanitary sewers, and treatment systems developed in Chapter 4 of the Wastewater Facility Plan and supporting documents to evaluate design and construction of improvements to Albany's wastewater system.

Wastewater Service Outside Albany's City Limits

It shall be the policy of the City to not provide wastewater service outside Albany's city limits, except as provided by specific contracts with the City of Millersburg, Oak View Elementary School, Spring Hill Country Club, or as authorized by the Albany City Council.

Future Sanitary Sewer Alignments and Sizing

It shall be the policy of the City that future sanitary sewer alignments and sizes shown in Attachments A-1 and A-2 are approximate due to the limited amount of detail contained in a planning document. The final alignment and size will be determined by the Public Works Department at the time the improvements are required.

A final decision concerning alignment and sizing of sanitary sewers will be made during engineering plan review and will be based on, but not limited to, the availability of downstream sewer capacity, existing and projected flows, and available pump station capacity.

Future Wastewater Treatment Plant Improvements

It shall be the policy of the City that future Wastewater Treatment Plant improvements shown in Attachment B are approximate due to the limited amount of detail in a planning document. The type, size, and location of improvements will be determined by the Public Works Department at the time the improvements are required.

Redundancy of Wastewater Pump Stations

It shall be the policy of the City that wastewater pump stations be designed and constructed to function during a power outage. Small lift stations shall have the capability to connect to a portable electrical generator to provide power to the station. Large stations may be required to the have the capability for on-site emergency power generation or secondary power feed in addition to the ability to connect to a portable electrical generator.

Basic Design Criteria

It shall be the policy of the City that the basic concept of the wastewater system is a gravity system. Pump stations and force mains will be minimized and will not be allowed unless approved by the Public Works Director (PWD).

Developer-Supplied Engineering Calculations

It shall be the policy of the City that it is the responsibility of developers to demonstrate compliance with the requirements set forth in this document to the satisfaction of the Public Works Director. Such compliance may require the developer to supply engineering calculations to prove available capacity and consistency with the wastewater system hydraulics model.

Prioritize Wastewater System Capital Improvements

It shall be the policy of the City to consider the following criteria in setting priorities for capital improvements to the wastewater system:

- Projects needed to meet regulatory requirements for improving water quality
- Projects needed to maintain capacity and reliability of critical system components, such as pump stations and structural integrity of sanitary sewers
- Projects related to street improvements
- Projects needed to eliminate or reduce basement flooding
- Projects needed to reduce inflow and infiltration, and
- Projects related to other issues such as alleviating health hazards

These criteria are not necessarily ranked in order of priority.

Reference Material

Detailed background information in support of this summary is contained in the *Albany Wastewater Facility Plan* (CH2M Hill, June 1998) and the *Mayor's Wastewater Task Force Report* (Galardi Consulting, LLC, January 2000), copies of which can be reviewed at the City of Albany, Public Works Department.

Section 2
Existing Facilities

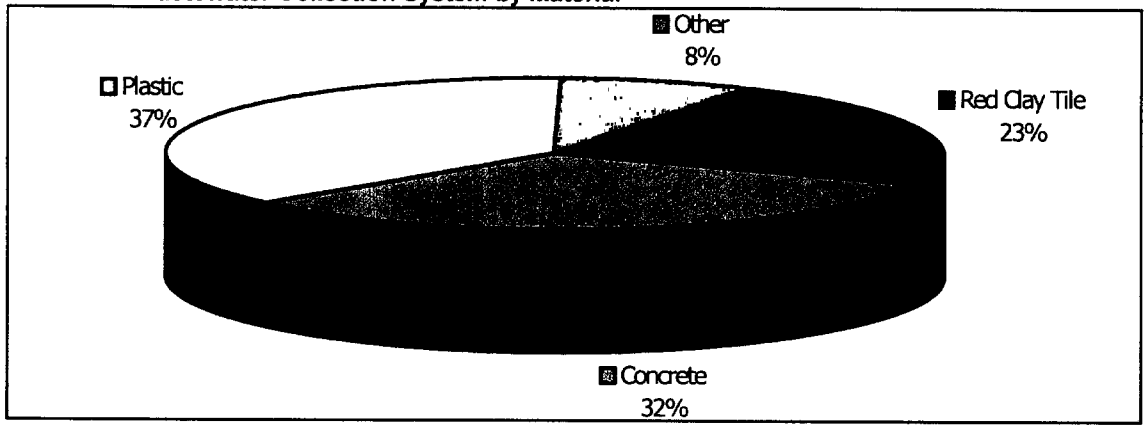
Existing Wastewater System

Albany's wastewater system includes a network of pipes and pump stations that route wastewater to the Wastewater Treatment Plant.

Wastewater Collection System

Construction of Albany's wastewater collection system dates back to the early 1900's. Today, the system consists of approximately 180 miles of pipes ranging in size from 3 to 72 inches in diameter. The oldest pipes were made of red clay tile, with concrete and plastic used in more recent years. A summary of the collection system grouped by material type is shown in Figure 2-1 below:

Figure 2-1
Percent of Wastewater Collection System by Material



The expected service life for sanitary sewer pipelines ranges from 50 to 75 years. As noted above, some existing sewer lines have exceeded this expected life. This network of pipelines represents a significant, aging investment with no dedicated replacement-funding source.

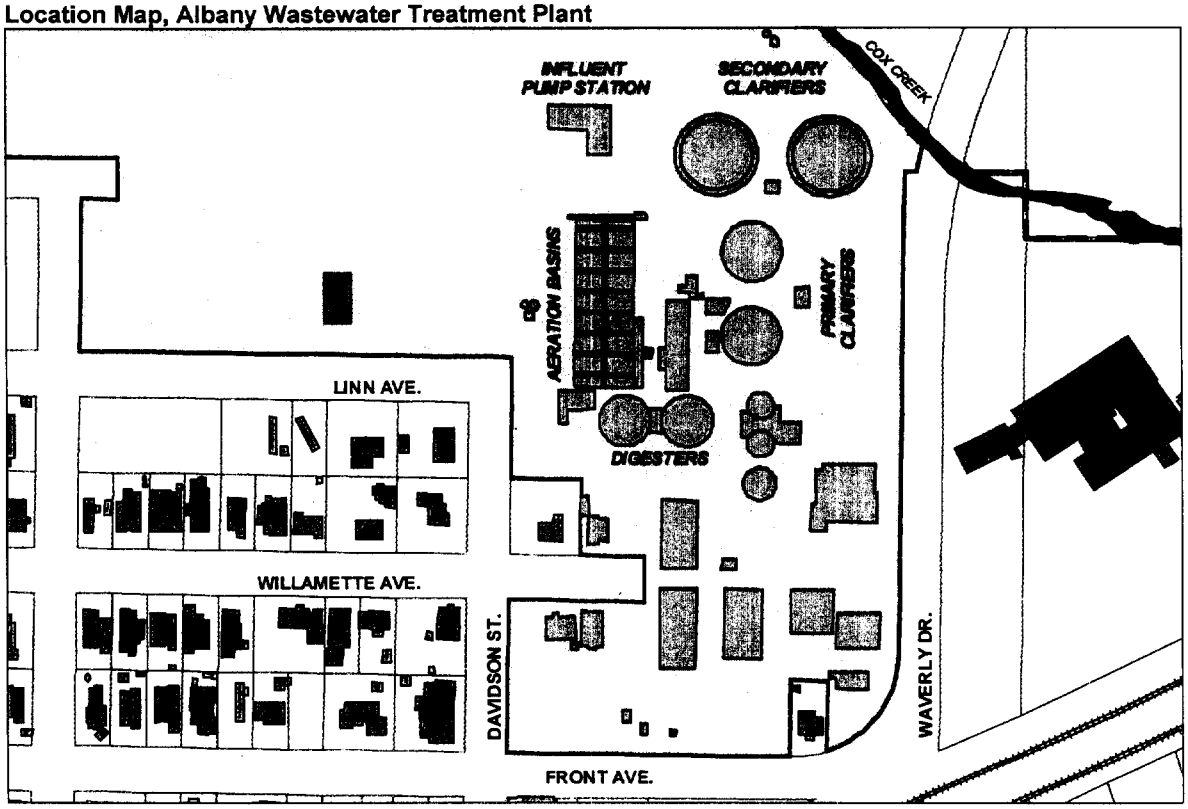
The collection system also includes 18 satellite pump stations that pump or "lift" sewage from low points in the collection system to sanitary sewers that drain to the Wastewater Treatment Plant by gravity. The pump stations range in capacity from 80 gallons per minute (gpm) to 1,900 gpm. Some of these pump stations were constructed within the last decade, while others date back as far as the early 1950s. The expected service life for a pump station structure is typically 50 to 75 years, while pumps, motors, controls, and related equipment are generally considered to have a 20-year service life.

Wastewater Treatment Plant

The original treatment plant was constructed in 1952 and provided limited treatment. Albany's Wastewater Treatment Plant was expanded in 1969 to increase the average dry weather capacity to 8.7 million gallons per day (MGD). In addition to adding capacity, this upgrade included more treatment units to provide a higher level of treatment (known as secondary treatment). The existing liquids treatment processes consist of raw sewage pumping, screening and grit removal, primary clarification, activated sludge aeration, secondary clarification, chlorination, and effluent conveyance to the Willamette River. The existing solids treatment processes consist of dissolved air flotation (DAF) thickening, anaerobic digestion of combined primary sludge and thickened waste activated sludge (WAS), and post-digestion centrifugal thickening of biosolids. Liquid biosolids are transported and applied to local agricultural sites near Albany for beneficial reuse.

During the early and mid 1990s, the City replaced and expanded an aging pump station and improved mixing of treated effluent within the Willamette River, but did not increase the Wastewater Treatment Plant's rated capacity. Although improvements to a wastewater treatment plant are typically designed for a 20-year window, Albany's treatment capacity has not changed for 30 years, since the 1969 expansion. A location map for the Wastewater Treatment Plant is shown below in Figure 2-2.

Figure 2-2
Location Map, Albany Wastewater Treatment Plant



System Deficiencies

During winter storm events when the groundwater levels are elevated, areas within the collection system become surcharged and occasionally overflow. Major collection system deficiencies include:

- Lack of adequate wet weather sanitary sewer capacity
- Lack of adequate lift station capacity, and
- Lack of an ongoing perpetual life replacement program.

The major existing deficiencies in the treatment system are:

- Inadequate wet weather hydraulic and treatment capacity
- Lack of a truly independent, redundant power source
- Limited secondary clarifier capacity
- Inadequate biosolids storage
- Lack of a permanent, dedicated septage receiving station
- Lack of an influent wet well cleaning mechanism

Minor existing deficiencies were also noted, including aging equipment and a freezing problem with DAF thickening equipment.

Section 3

Wastewater Quantities & Characteristics

Population and Service Area Projections

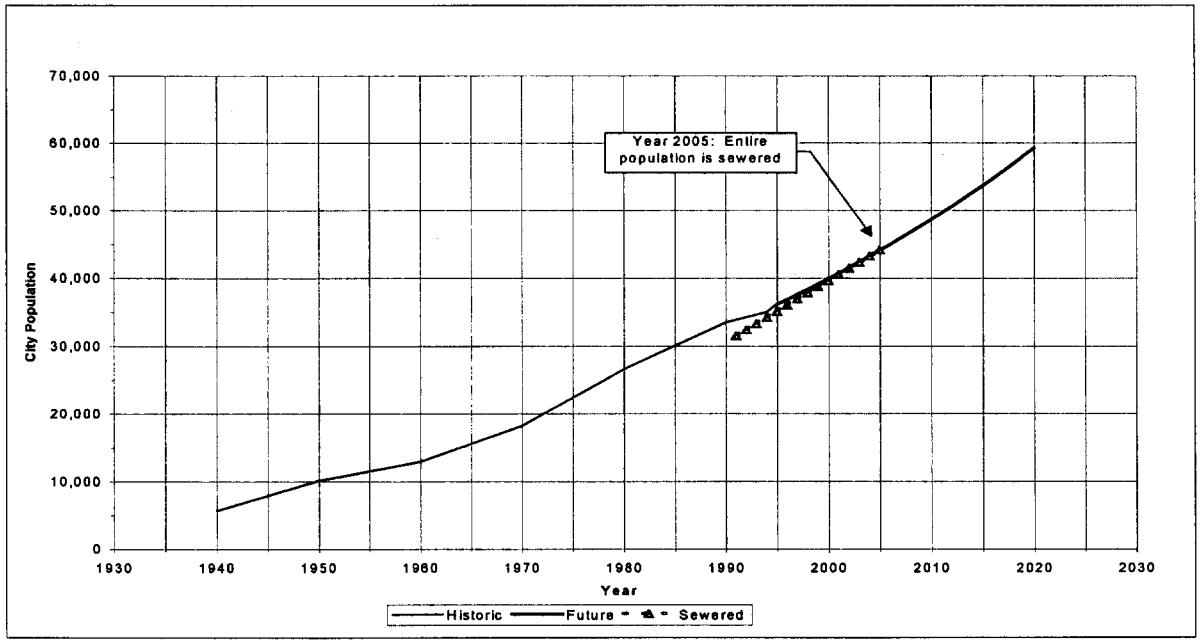
Population and service area projections for the City of Albany and the City of Millersburg were developed separately and then combined. The methodology used to estimate existing and project future populations is summarized briefly below and in detail in Chapter 3 of the Wastewater Facility Plan.

Albany

At present, not every residence in the Albany city limits is connected to the sanitary sewer system. A small percentage uses septic tanks and drain fields. Therefore, two types of populations were projected, the overall population and the sewered population. It is assumed that all residences will be connected to the sewer system by the year 2005; therefore, the sewered population will equal the overall projected population from that time forward.

Historic population trends and projected populations for Albany through year 2020 are summarized on Figure 3-1 below. Historic data is taken from the U.S. Census Bureau for 1900 through 1990 and from the Portland State University Population and Census Research Center for 1994 and 1995. The existing population was determined based on work completed by Kimley-Horn and Associates, Inc. (KHA) in development of Albany's *Transportation System Plan*, 1997.

Figure 3-1
Historic and Projected Population to 2020, Albany Only



Future populations for Albany were estimated based on an annual growth rate of 2 percent. This rate is consistent with historic trends, the *Transportation System Plan* (Kimley-Horn and Associates, 1997) and the *East I-5 Infrastructure Study* (CH2M Hill, 1995). Based on this growth rate and the assumption that Albany's population will be fully served by 2005, a population of approximately 59,300 is projected for year 2020, the design period for wastewater treatment plant improvements.

Build out population projections for the UGB were based on existing population and assumed population densities for vacant and partially developed areas. Slightly lower build out densities were assumed for partially developed areas. Build out densities are based on an average household density of 2.46 persons per dwelling unit and are summarized in Table 3-1 below.

Table 3-1
Assumed build out densities for vacant residential areas, Albany Only

Land Use Designations	Dwelling Units / Acre		Population/ Dwelling Unit	Population/Acre	
	Vacant	Partial		Vacant	Partial
RS 2	2	2	2.46	5	5
RS 5	6	5	2.46	15	12
RS 6.5	6	5	2.46	15	12
RM 3	20	16	2.46	49	39
RM 5	12	10	2.46	30	25

The expected additional population for each basin was determined by multiplying the above densities by the amount of vacant and partially-developed residential land within the basin. The future population was added to each basin's existing population to determine the build out or ultimate population for the basin. Heavy and light industrial land acreage was determined by overlaying the Comprehensive Plan land use map with a map of the sanitary sewer basins. Build out populations and industrial areas are summarized below in Table 3-2.

Table 3-2
Projected Build Out Population, Albany Only

Items	1995	2000	2005	2010	2015	2020	Ultimate (UGB)
Total Population[1]	36,200	40,000	44,100	48,700	53,800	59,300	108,500
Sewered Population[1]	35,100	39,600	44,100	48,700	53,800	59,300	108,500
Total Light Industrial Developed Acres[2]	250	305	360	425	495	570	1,250
Total Heavy Industrial Developed Acres[2]	240	240	245	250	250	255	290
Service Area[2]	3,425	3,900	4,370	4,850	5,380	5,960	11,100

[1] Rounded to nearest 100 persons

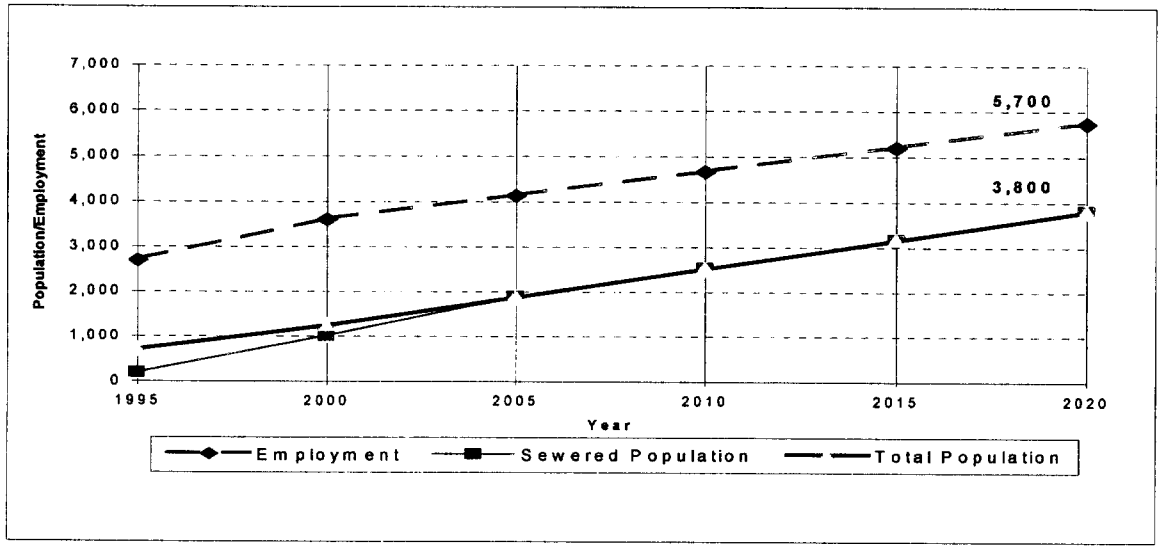
[2] Rounded to nearest 5 acres

Millersburg

Millersburg's population projections in this report are based on the *East I-5 Infrastructure Study* (CH2M Hill, 1995) and incremental growth rates provided by the City of Millersburg using an anticipated build out population of 6,800. The City of Millersburg's projected populations through year 2020 are illustrated in Figure 3-2 below.

The number of industrial employees in Millersburg in 1995, 2000, and 2015 were adjusted by the City of Millersburg from the *East I-5 Infrastructure Study* (CH2M Hill, 1995) to correspond with the Millersburg population adjustments from the same study.

Figure 3-2
Historic and Projected Employment & Population Projections, Millersburg Only



The ultimate or build out population and acreage for Millersburg are shown in Table 3-3 below:

Table 3-3
Projected Build Out Employment & Population, Millersburg Only

Items	1995	2000	2005	2010	2015	2020	Ultimate
Total Employment[1]	2,700	3,600	4,100	4,700	5,200	5,700	8,000
Total Population[2]	700	1,200	1,900	2,600	3,200	3,800	6,800
Sewered Population[2]	**200**	**1,000**	**1,900**	**2,600**	**3,200**	**3,800**	**6,800**
Total Light Industrial Developed Acres[3]	10	40	70	110	140	180	340
Total Heavy Industrial Developed Acres[3]	270	380	510	645	780	910	1,540
Service Area[3]	310	640	990	1,245	1,500	1,760	2,970

[1] Rounded to nearest 100 employees.

[2] Rounded to nearest 100 population.

[3] Rounded to nearest 5 acres.

Summary Population and Acreage Projections

Build out population and sewer service area projections developed for each basin are shown on Figure 3-3, and incremental projections for the entire service area are summarized in tabular format in Table 3-4 below.

Table 3-4
Projected build out Population & Service Area, Albany and Millersburg Combined

Items	1995	2000	2005	2010	2015	2020	Ultimate
Total Population[1]	36,920	41,200	46,000	51,300	57,000	63,100	115,300
Sewered Population[1]	**35,300**	**40,600**	**46,000**	**51,300**	**57,000**	**63,100**	**115,300**
Total Light Industrial Developed Acres[2]	260	345	430	535	635	750	1,590
Total Heavy Industrial Developed Acres[2]	510	620	755	895	1,030	1,165	1,830
Service Area[2]	3,735	4,540	5,360	6,095	6,880	7,720	14,070

Flow and Load Projections

Base Flow Projections

Base sewage flow is considered dry weather average day (DWAD) flow, excluding infiltration and inflow (I/I). The methodology used to determine base sewer flows for each major land use is briefly summarized below.

Residential

Residential base sewage flows were projected by multiplying the sewered population projections by 75 gallons per capita per day (gpcd). This allowance is based on a review of metered, winter water-use records for the period beginning October 1992 and ending March 1995. This review showed an average per capita demand rate of 67.5 gpcd. Water usage for winter months was assumed to correspond with sewage flows because irrigation uses would be unlikely during that time of the year. The per capita rate from the 1986 Facility Plan of 75 gpcd was used for future projections as a conservative allowance.

Commercial

Commercial base sewage flows are projected based on an additional allowance of 10 gpcd. This factor was determined after a review of three years of combined commercial and light industrial metered water use records.

Industrial

Industrial base sewage flows for the City of Albany service area were divided into light and heavy industries. Light industrial flows were projected by multiplying the number of developed acres in a given year by a unit allowance of 1,300 gallons per acre per day (gpad). This flow rate per acre was developed from a survey of winter water use from light industrial businesses between 1993 and 1995.

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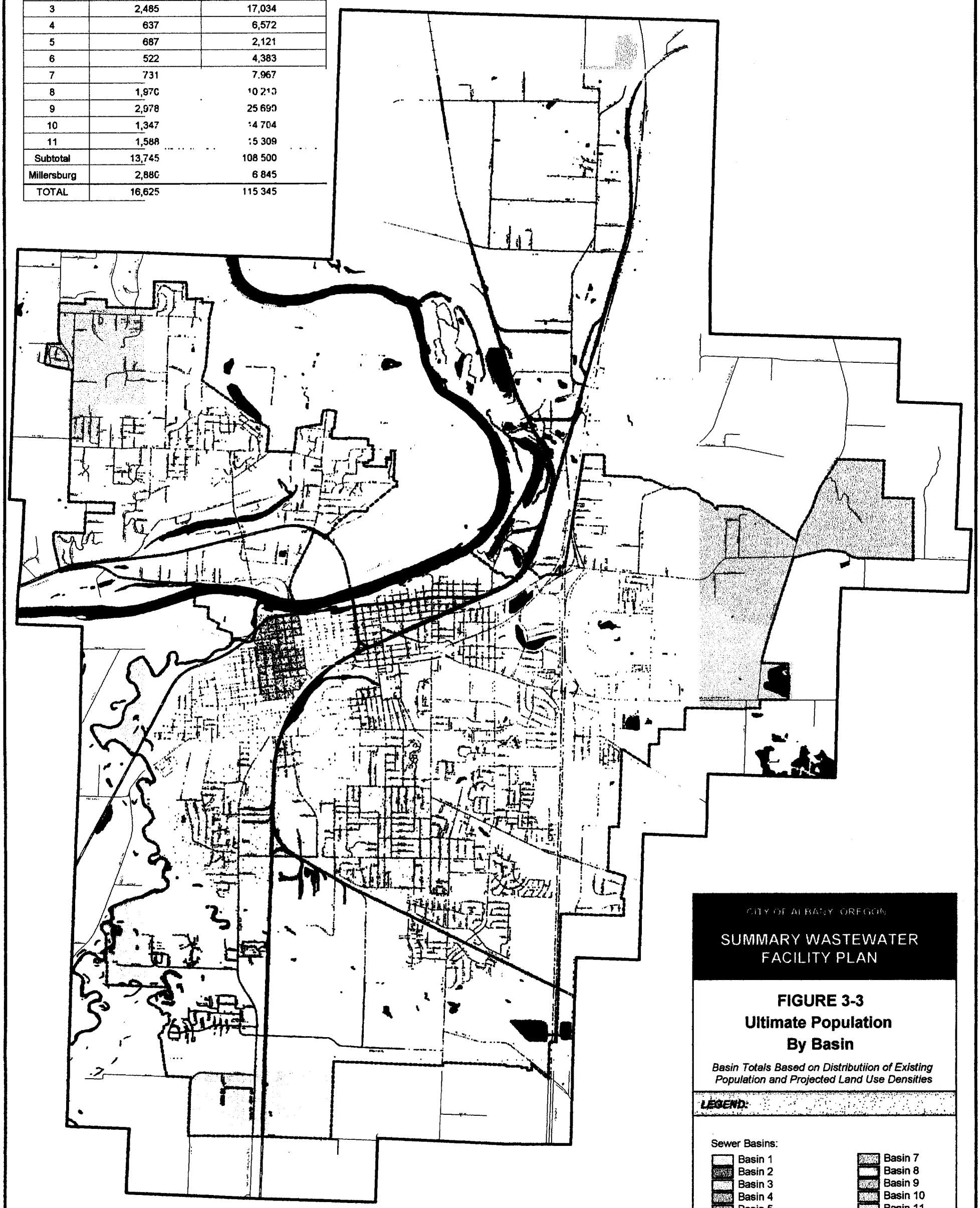
[1] Rounded to nearest 100 population

[2] Rounded to nearest 5 acres

Basin	Ultimate Area (Acres)	Ultimate Population
1	672	3,859
2	127	651
3	2,485	17,034
4	637	6,572
5	687	2,121
6	522	4,383
7	731	7,967
8	1,970	10 210
9	2,978	25 690
10	1,347	14 704
11	1,588	15 309
Subtotal	13,745	108 500
Millersburg	2,880	6 845
TOTAL	16,625	115 345



CITY OF ALBANY, OREGON

SUMMARY WASTEWATER FACILITY PLAN

FIGURE 3-3
Ultimate Population By Basin

Basin Totals Based on Distributiion of Existing Population and Projected Land Use Densities

LEGEND:

Sewer Basins:

- Basin 1
- Basin 2
- Basin 3
- Basin 4
- Basin 5
- Basin 6
- Basin 7
- Basin 8
- Basin 9
- Basin 10
- Basin 11
- Millersburg

Geographic Information Services

1000 0 1000 2000 3000 4000 5000 Feet

Industrial (Continued)

Heavy industrial flows were projected by multiplying additional (or future developed) projected heavy industrial acres by a unit allowance of 6,000 gpad and adding to that the annual average base flow from existing Albany industries. The unit flow allowance for heavy industrial properties was based on a review of three years of historic industrial wastewater and water use data recorded between 1994 and 1996.The industrial base flow and flow rate per acre factor were calculated assuming a six-day work week.

Based on the sewer agreement between the City of Albany and the City of Millersburg, industrial wastewater discharges from the City of Millersburg are limited to domestic or non-process wastes only. Process wastes are treated by individual industries. The wastewater flows for Millersburg industries were, therefore, projected on the basis of residential uses and industrial employment projections. A flow rate of 25 gallons per employee per day (gped) was used to project industrial domestic flows.

Infiltration and Inflow (I/I)

Infiltration and inflow to the wastewater collection system was determined based on rainfall records and wastewater flow monitoring during the winter of 1995-96 and actual Wastewater Treatment Plant records between 1993 and 1995. The existing I/I was then adjusted to reflect a design storm event (for wet weather this is a storm that on average occurs once in five years).

Future infiltration and inflow was projected by multiplying additional sewer service areas by an I/I rate of 3,000 gpad. This allowance is based on the performance of two newly sewered basins during a five-year storm event.

Base Load Projections

The dry weather average day base load projections for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), total Kjeldahl nitrogen (TKN), ammonia nitrogen (NH_3-N), and total phosphorus (TPO_4) were determined separately for Albany and Millersburg, but with the same methodology for each city. Base load projections were calculated by multiplying the projected sewered population of a given year by the existing DWAD load per capita.

The existing DWAD BOD_5 load was determined from three years of plant influent data (1993 - 1995). The DWAD load for each year of data was divided by the sewered population for that year to establish a per capita value for each year. The average per capita value for these three years was calculated and used for projections. Because the historic data is for the combined flow from Albany and Millersburg, the same per capita loadings were used for projecting loads from each city. TSS load per capita was determined the same way.

Textbook values were used to develop influent nutrient concentrations for TKN, NH_3-N, and TPO_4. The assumed values, noted below, are taken from *Wastewater Engineering,* Third Edition, Metcalf & Eddy, 1991, for medium-strength, untreated domestic wastewater:

- TKN 35 mg/L
- NH3-N 25 mg/L
- TPO4 8 mg/L

These concentrations were used to calculate loads based on historic flows. Unit per capita nutrient loads were then calculated and used to forecast future nutrient base loads. The unit per capita values used for load projections are as follows:

- BOD_5 0.24 lbs./d/capita (based on historic data)
- TSS 0.22 lbs./d/capita (based on historic data)
- TKN 0.05 lbs./d/capita
- NH_3-N 0.03 lbs./d/capita
- TPO_4 0.01 lbs./d/capita

Peaking Factors

Dry and wet weather peaking factors were developed for flows, BOD_5, and TSS loads on the basis of three years of plant influent data between 1993 and 1995. Peaking factors for TKN, NH_3-N and TPO_4 loads were based on textbook concentrations and peak flows over this same period.

Wastewater flow and waste load forecasts were developed to form a basis for planning future upgrades and expansions of the wastewater collection and treatment system. The forecasts were performed for the parameters routinely used in the design of wastewater facilities. Population and land use projections, and peak I/I projections from sewer modeling were used to develop flow and waste load forecasts for the Albany Wastewater Treatment Plant in five-year increments, starting with 1995 and ending with 2020. An ultimate build out forecast was also developed.

Forecasts for dry and wet weather flows and loads are summarized in Table 3-6. They include average day (AD), maximum month (MM), and peak instantaneous (PI) flows and maximum month BOD and TSS loads.

Table 3-5
Projected Flows and Loads, Albany and Millersburg

	1995	2000	2005	2010	2015	2020	Ultimate
Sewered Population	**35,300**	**40,600**	**46,000**	**51,300**	**57,000**	**63,100**	**115,300**
Summary, Flows (mgd)							
Dry Weather							
Average Day (AD)	5.7	6.8	7.8	8.8	9.8	11	20
Maximum Month (MM)	7.4	8.9	10	11	13	14	26
Peak Instantaneous (PI)	21	23	26	28	31	33	55
Wet Weather							
Average Day (AD)	15	16	17	18	20	21	32
Maximum Month (MM)	21	22	24	25	27	29	44
Peak Instantaneous (PI)	39	41	44	46	49	52	77
Summary, Loads (lbs./day)							
Dry Weather							
Maximum Month BOD	10,200	11,800	13,300	14,800	16,500	18,300	33,400
Maximum Month TSS	9,000	9,800	11,200	12,400	13,800	15,300	28,000
Wet Weather							
Maximum Month BOD	9,600	11,100	12,500	13,900	15,500	17,200	31,400
Maximum Month TSS	9,000	10,300	11,700	13,000	14,000	16,000	29,300

Section 4

Regulatory and Operating Requirements

Regulatory Requirements

Under requirements of the federal Clean Water Act (CWA), cities are required to obtain and comply with a permit to discharge treated effluent to the waters of the state (Willamette River). These permits are administered by the Environmental Protection Agency (EPA) who has, in turn, delegated permit issuance authority to most states. Oregon is a delegated permit authority. The Oregon Environmental Quality Commission (EQC) sets statewide permit policy, and the Department of Environmental Quality (DEQ) issues and administers these permits. The State also has the authority to set more stringent requirements than those established by the CWA.

The current and proposed regulations of the EPA and EQC were reviewed and summarized to establish design criteria for the development of wastewater collection, treatment, and disposal alternatives. The review included secondary treatment regulations, Willamette River basin water quality standards and guidelines, biosolids management criteria, and reliability and redundancy criteria.

Operational data for the Wastewater Treatment Plant from 1993 through 1995 was analyzed. The data showed that the plant consistently met or exceeded the performance criteria set forth in Albany's current National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit. All biosolids metals levels were below the U.S. EPA Exceptional Quality criteria. The plant has achieved acceptable treatment levels for the period 1993 through 1995. The 85 percent, five-day carbonaceous biochemical oxygen demand ($CBOD_5$) and total suspended solids (TSS) removal criteria were met as well, but with difficulty during wet weather flows because the wastewater concentrations were diluted significantly. Ammonia and chlorine toxicity were eliminated as a concern by the outfall and multiport diffuser installed in 1994.

Willamette River Basin Water Quality Standards/Guidelines

The standards for river basins in the State of Oregon are established by the EQC through the Oregon Administrative Rules (OAR) 340-041-445. These rules are reviewed every three years for setting new or modifying existing standards. Water quality standards for specific reaches of the Willamette River and its tributaries are established for the water quality parameters listed below.

- Bacteria
- Pollutant Concentrations
- Biosolids Management
- Mass Loads
- Toxic Substances
- Temperature
- Turbidity
- pH
- Dissolved Oxygen (DO)
- Total Dissolved Solids
- Mixing Zone

The Wastewater Facility Plan found that Albany has three outstanding regulatory requirements that must be addressed. These needs are discussed below and are followed by other water quality parameters reviewed with the facility plan.

1. Reduce Overflows of Raw Sewage to the Willamette and Calapooia Rivers

The sewer system does not have the capacity to convey all the wastewater to the Wastewater Treatment Plant or to treat high flows during intense or prolonged wet weather periods. Consequently, wastewater accumulates within the pipe network, eventually overflowing into the Calapooia and Willamette Rivers. During severe events, this backup of wastewater may also flood some unprotected basements.

The EQC has adopted minimum design events or storms that wastewater systems must convey and treat without overflowing. During dry weather, wastewater systems must be capable of conveying and treating wastewater flows during a 24-hour storm event that occurs up to once every ten years on average. This requirement has been adopted and is currently in force. For wet weather periods, the EQC has established a similar requirement for a 24-hour storm event that occurs on average once every five years or more frequently. Most wastewater systems cannot meet the wet weather design overflow standard. To provide communities with an opportunity to bring their systems up to the new wet weather standard, the winter overflow standard will not be effective until 2010.

2. Provide Better Wastewater Treatment

The EQC has established more stringent water quality standards for the Willamette River than are required by EPA. These standards require that effluent discharged to the Willamette River be treated to a higher level than standard secondary treatment requirements. In essence, these standards require facilities to remove more waste, resulting in less pollution being discharged to the river. The requirement was established after Albany's last treatment plant expansion and will not be triggered for Albany until the capacity of the plant is expanded. Once the plant capacity is expanded, Albany's permit will be modified to require that these more stringent discharge standards are met.

The expiration date of the current City of Albany Wastewater Treatment Plant National Pollutant Discharge Elimination System (NPDES) permit was October 31, 1998. Albany applied to renew the permit and is waiting DEQ action on the application. The existing permit remains in-force until action is taken on the renewal application. The discharge requirements of the current permit are summarized in Table 4-1. Anticipated discharge criteria were analyzed based on current water quality regulations as modified by the 1995 triennial review (adopted January 1996) and as follow-up to discussions held with DEQ staff regarding potential future water quality issues.

Table 4-2 shows the potential discharge standards and projected mass loads to the Willamette River based on the basin standards and projected 2020 design flows. For example, it is anticipated that the dry weather discharge limits for average monthly concentrations of $CBOD_5$ and TSS will be reduced from 15 and 20 mg/L, respectively, to 10 mg/L for each. The relationship of existing permitted to projected 2020 mass loads is also shown graphically on Figure 4-1. The projected wet weather mass loads shown in Table 4-2 are greater than the existing permit mass loads. As a general policy, EQC does not allow increases in mass loads associated with growth when it renews Wastewater Treatment Plant NPDES permits.

Based on current operating data, it would be necessary for the City to improve the plant's treatment removal efficiency in excess of the more stringent basin standards to consistently stay within permitted mass load limits. Because of the significant long-term costs that would be incurred, the City will request a mass load increase, as provided for in the Oregon Administrative Rules. For a mass load increase to be approved, it must be shown that the additional loading will not result in water quality violations and that the cost of added treatment to comply with permitted mass load limits is not reasonable.

Table 4-1
City of Albany WWTP
Existing NPDES Permit Discharge Criteria and Mass Loads

Parameters	Effluent Concentrations[a] Monthly Average (mg/L)	Weekly Average (mg/L)	Mass Loads Monthly Average (lbs./day)	Weekly Average (lbs./day)	Daily Maximum (lbs./day)
		May 1 through October 31			
$CBOD_5$	15	25	1,088	1,814	2,177
TSS	20	40	1,450	2,180	2,900
		November 1 through April 30			
$CBOD_5$	25	40	3,000	4,600	6,100
TSS	30	45	3,700	5,500	7,300
		Other Criteria			
FC/100 mL	200	400			
Cl_2 Residual			1.5 mg/L		
pH			6.0 to 9.0		
Removal Efficiency			85 %		

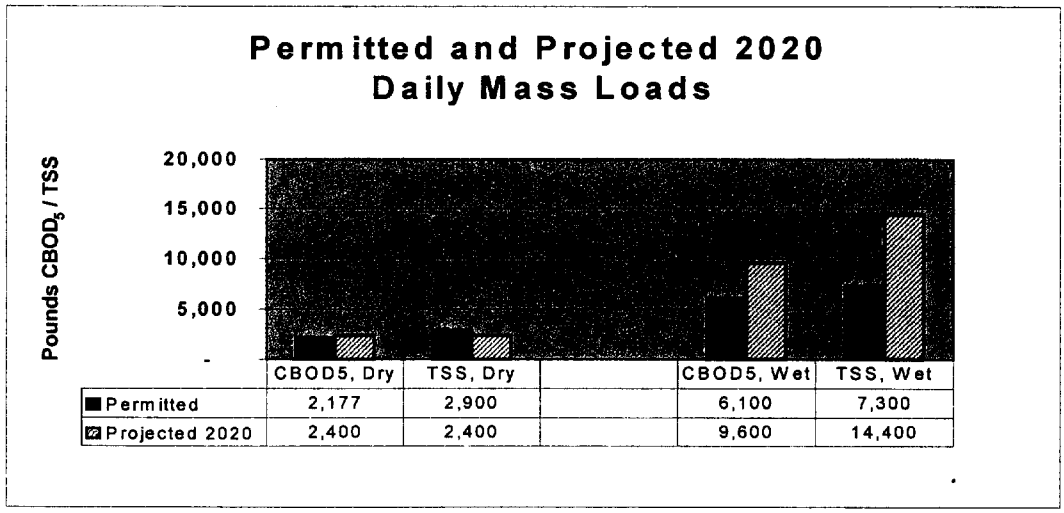
[a] Average effluent concentrations and mass loads based on the following design flows:
May to October - average dry weather flow of 8.7 mgd
November to April - average wet weather flow of 14.6 mgd
Daily mass loads suspended when flow through WWTP exceeds 17.4 mgd

Table 4-2
City of Albany WWTP
Potential Discharge Criteria and Mass Loads for the Willamette River
Based on Effluent Concentration Basin Standards and Projected (2020) Design Flows

Parameters	Effluent Concentrations[a] Monthly Average (mg/L)	Weekly Average (mg/L)	Mass Loads[b] Monthly Average (lbs./day)	Weekly Average (lbs./day)	Daily Maximum (lbs./day)
		May 1 through October 31			
$CBOD_5$	10	15	1,200	1,800	2,400
TSS	10	15	1,200	1,800	2,400
		November 1 through April 30			
$CBOD_5$	20	40	4,800	7,200	9,600
TSS	30	45	7,200	10,800	14,400
		Other Criteria			
E. Coli/100 mL	126[c]	406[d]			
Cl_2 Residual (daily/monthly)			1.84 / 0.97 mg/L		
pH			6.5 to 8.5		
Removal Efficiency			85 %		

[a] Average effluent concentrations and mass loads based on the following (projected 2020) design flows and basin standards, OAR 340-041-0455(1)(a)
May to October - 14.2 mgd MMADF
November to April - 28.8 mgd MMADF
[b] Projected mass loads rounded to nearest 100 pounds per day.
[c] A 30-day log mean of 126 E. Coli organisms per 100 mL, based on a minimum of five samples.
[d] No single sample shall exceed 406 E Coli organisms per 100 mL.

Figure 4-1
Permitted and Projected 2020 Mass Loads



3. Increase Biosolids (Sludge) Storage

The wastewater treatment process removes and breaks down waste material through a combination of physical, chemical, and biological processes. During biological treatment, excess bacteria are generated and are stabilized through a process known as digestion. The products of the digestion process are solids, methane gas, and water. The solids are used as a fertilizer for local farm fields. Because Albany does not have facilities to store biosolids during wet weather, they are applied to fields year round, including periods of wet weather when fields are less capable of absorbing nutrients. Consequently, there is a greater risk that the solids will wash off into nearby streams.

The risk of biosolids running off to streams during wet weather has led to a tightening of biosolids applications requirements and limitation of biosolids application during wet weather months. The Facility Plan identified the need for Albany to construct a biosolids storage facility that would allow adequate winter storage. The facility is currently under construction and should be operational by December 2000.

Other Water Quality Parameters

In addition to standard mass load considerations, the following water quality parameters were also considered in development of the Wastewater Facility Plan.

Toxic Substances

Ammonia

Based on discussions with DEQ, no limitations on ammonia discharge are anticipated for the Albany Wastewater Treatment Plant, at least in the foreseeable. Ammonia toxicity is not considered an issue given the current outfall dilution capability of 118:1.

Chlorine

A review of Wastewater Treatment Plant flows and variation in effluent chlorine concentrations was completed for calendar year 1998. Using the methodology given in the EPA's Technical Support Document for Water Quality-Based Toxics Control, the calculated chlorine permit limits are a maximum daily concentration of 1.72 mg/L and an average monthly concentration of 1.03 mg/L.

Temperature

The EQC has adopted temperature standards that prohibit point discharges from discharging effluent that results in a measurable increase in the receiving stream's temperature. OAR 340-047-026(3)(F) defines a measurable increase as a change in stream temperature greater than 0.25 degrees Fahrenheit at the edge of the permitted mixing zone.

CH2M HILL performed a thermal load analysis using the DEQ-recommended mass balance approach, conservative high plant flows, and minimum stream flows in the Willamette River. The analysis demonstrated that the effluent would not result in a measurable increase in stream temperature.

Non-Regulatory Requirements

Non-regulatory requirements are steps Albany takes locally to manage the community's wastewater system, accommodate growth, and provide the level of service and reliability the community has come to expect. The three non-regulatory issues discussed in the Wastewater Facility Plan and reviewed by the Task Force are:

Perpetual Life Replacement of the Collection System

Like many other cities across the country, Albany has a sewer system that is relatively old. Over 50 percent of the 180 miles of pipe are over 30 years old, and 27 percent are over 50 years old. While an annual pipe repair and replacement program is costly, responding to unanticipated emergency situations is even more costly and potentially dangerous. The pace of replacement was critically reviewed by the Task Force. The Task Force recognized the following advantages of a perpetual life replacement program:

- High-risk replacements can be taken care of before problems arise.
- Sewer system improvement projects can be coordinated with other City improvements to minimize total costs.
- The reliability of the wastewater collection system is maintained.
- Annual incremental replacements will reduce future capital investments to rehabilitate the wastewater collection system.

The Task Force considered three alternative funding levels for a perpetual life replacement program. Alternatives were developed based on the number of years a given level of investment would take to replace or cycle through the entire system. A summary of the three alternatives considered by the Task Force is shown in Table 4-3.

Table 4-3
Perpetual Life Replacement Program Alternatives

Alternative	Annual Replacement	Years to full replacement
1	$ 200,000	950
2	$1,000,000	190
3	$1,900,000	100

The Task Force considered the impact that the annual costs would have on the sewer rates and selected a modified version of Alternative 2. The Task Force recommended that the City initially adopt a perpetual life replacement program at $1,000,000 per year and accelerate the pace of the replacement program as existing and future debt is retired. For example, when Sewer Bond Measure 1993 Series A is retired in fiscal year 2009-2010, the annual bond debt payment of $680,000 would be dedicated to the perpetual life replacement program. Ultimately, the Task Force recommended sufficient funding be dedicated to the replacement program to ensure a 100-year replacement cycle consistent with Alternate 3 above.

Accommodate Growth

The scope and extent of system needs include improvements required to bring the current system into compliance with new regulatory requirements and allow for growth. An annual growth rate of 2 percent was used to project growth within the Albany UGB. As noted earlier, this rate is based on historic growth patterns. The City of Millersburg provided growth projections for domestic wastewater in five-year increments, including the estimated build out population for Millersburg's UGB.

Operation and Maintenance

In addition to improvements needed to expand capacity, $500,000 is required for replacement of existing treatment facilities before planned capital improvements are completed. This cost was reviewed with the Task Force and incorporated with the total capital need used in development of rates and SDC fees.

Section 5

Alternative Improvement Strategies

System improvement alternatives were developed to address the projected wastewater system requirements during the planning period. These were screened to eliminate unworkable ideas and focus time and effort on the more promising solutions.

Alternatives

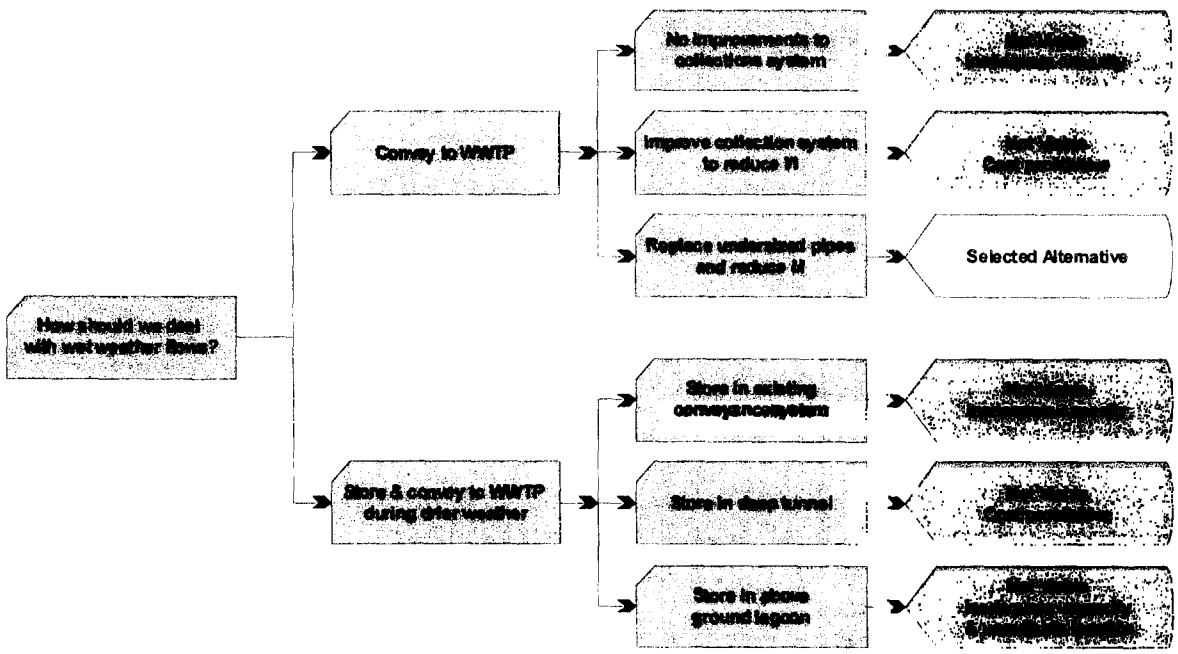
Collection

Two alternatives for upgrading the collection system were identified:

- ***Conveyance***: Convey all wastewater flows to the Wastewater Treatment Plant under peak flow conditions, or
- ***Storage***: Store a portion of the peak wastewater flows (either in the collection system or within dedicated storage facilities)

With the conveyance alternative, the collection system would be improved to convey peak flows to the Wastewater Treatment Plant during a five-year design storm. With the storage alternative, a portion of the five-year design storm would be stored in the collection system or in separate storage facilities. The stored flow would be conveyed to the Wastewater Treatment Plant during lower flow periods. The advantage of this approach would be to reduce the peak design capacity of the Wastewater Treatment Plant by approximately 20 mgd. The collection system decision diagram is shown below in Figure 5-1.

Figure 5-1
Collection System Decision Diagram



Conveyance

The approaches considered for the conveyance alternative were:

- Leave the existing system as is;
- Reduce infiltration and inflow (I/I); and
- Replace undersized pipes in the existing system.

Modeling of the existing collection system determined that peak flows could not be conveyed during a five-year design storm; therefore, this first approach was not considered further. The second approach assumed that approximately 5 percent of I/I will be removed by the next major plant expansion. Additional modeling of the collection system revealed that even with removal of 5 percent of I/I, bottlenecks in the existing system will occur during peak flows. These will become more severe in the future when flows are projected to increase.

Storage

The storage system alternative could be implemented using three different approaches:

- Using existing collection system capacity;
- Providing deep tunnel capacity; or
- Providing aboveground lagoon capacity.

As noted earlier, the existing collection system does not have any additional capacity to store peak flows; therefore, this approach was eliminated. The deep tunnel approach was not considered cost-effective because the costs for construction, operation, and maintenance are expected to be prohibitive. Consequently, aboveground lagoons constituted the only practical approach for the storage alternative.

Siting aboveground lagoons for raw sewage storage within the city limits at a location other than at the Wastewater Treatment Plant was determined to be impractical because a suitable location with adequate land area is not available. Further, the cost of providing odor control and increased operation and maintenance would be prohibitive.

Consequently, the selected collection system alternative involves transporting and treating all but 5 percent of peak flows to the Wastewater Treatment Plant. A 5 percent reduction in I/I was projected to be cost effective and is anticipated as the collection system, including sewer service laterals, is reconstructed under the perpetual life replacement program.

Treatment

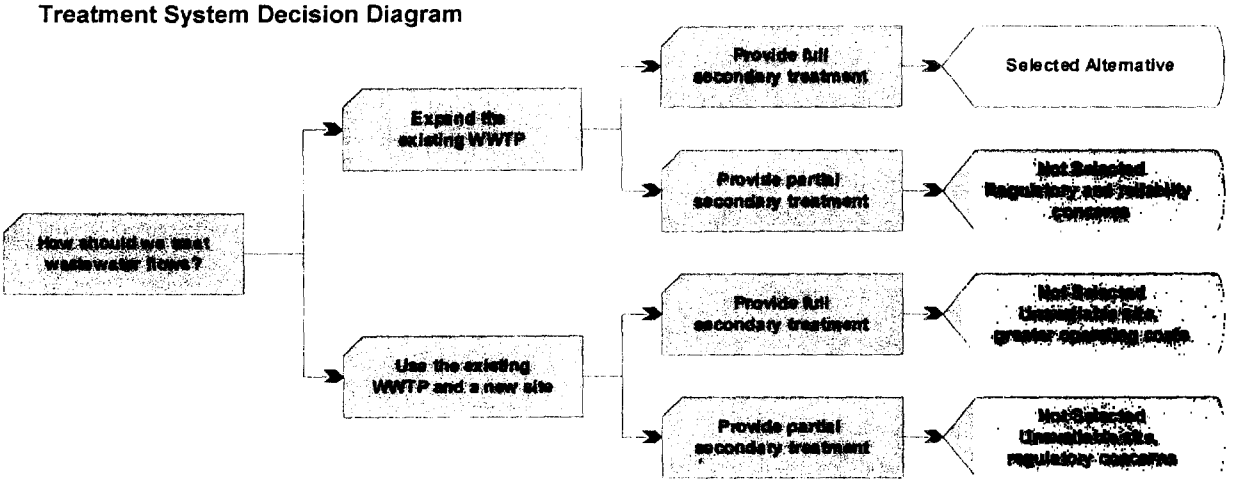
Treatment system alternatives were considered as follows:

1. Use the existing site with:
   a) Full secondary treatment, or
   b) Partial secondary treatment.

2. Use the existing and new site(s) with:
   a) Full secondary treatment,
   b) Partial secondary treatment.

The treatment system decision diagram is shown below in Figure 5-2.

Figure 5-2
Treatment System Decision Diagram



Screening Criteria

The alternatives were screened based on ease of implementation, operation and maintenance considerations, and environmental impacts. The specific factors considered within each category are listed in Table 5-1.

Table 5-1
Treatment System Noncost Screening Criteria

Category	Impact
Implementation	Ease of implementation
	Energy use and resource recovery
	Future regulatory compliance
	Ease of phased construction and future expansion
	Public involvement and acceptance
Operation and Maintenance	Ease of operation, maintenance, and automation
	Performance reliability
	Flexibility
	Safety/Security
	Staffing requirements
Environmental	Natural habitat/wetlands
	Visual
	Noise
	Odor
	Land use issues
	Recreation
	Public education value

General vicinities for new sites were identified. The sites considered are illustrated in Figure 5-3. New sites were categorized as either remote from or adjacent to the existing plant. The concept of locating treatment facilities at the potential remote sites was not considered viable. For example, a remote site west of the existing Plant, close to downtown Albany on the south banks of the Willamette River, was not considered a good location because:

- Valuable riverfront property for parks or businesses would be eliminated;
- Downtown Albany might be adversely affected by odors from the plant and other aesthetic issues like visual impact and noise;
- Most of the flow from the cities of Albany and Millersburg would have to be pumped to the new remote site.
- The natural floodplain would have to be modified for construction; and

- Investments in the existing facility in excess of $30 million (June 1996 Book Value) would be lost.

A new site northeast of the existing Plant on the east side of the Willamette River was not considered a good location because:

- Land availability is very low with uses including industry, lakes, floodplains, and parks in the area;
- Some of the flow from Albany would have to be pumped to a new site; and
- Investments in the existing site would be lost.

A new site on the north side of the Willamette River was eliminated because:

- Land availability is extremely limited because of natural habitat and wetlands near the Willamette River;
- One or more major river crossings would be required to deliver the majority of plant flow to the new site; and
- Investments in the existing site would be lost.

Alternatives involving new remote sites, therefore, were eliminated from further consideration.

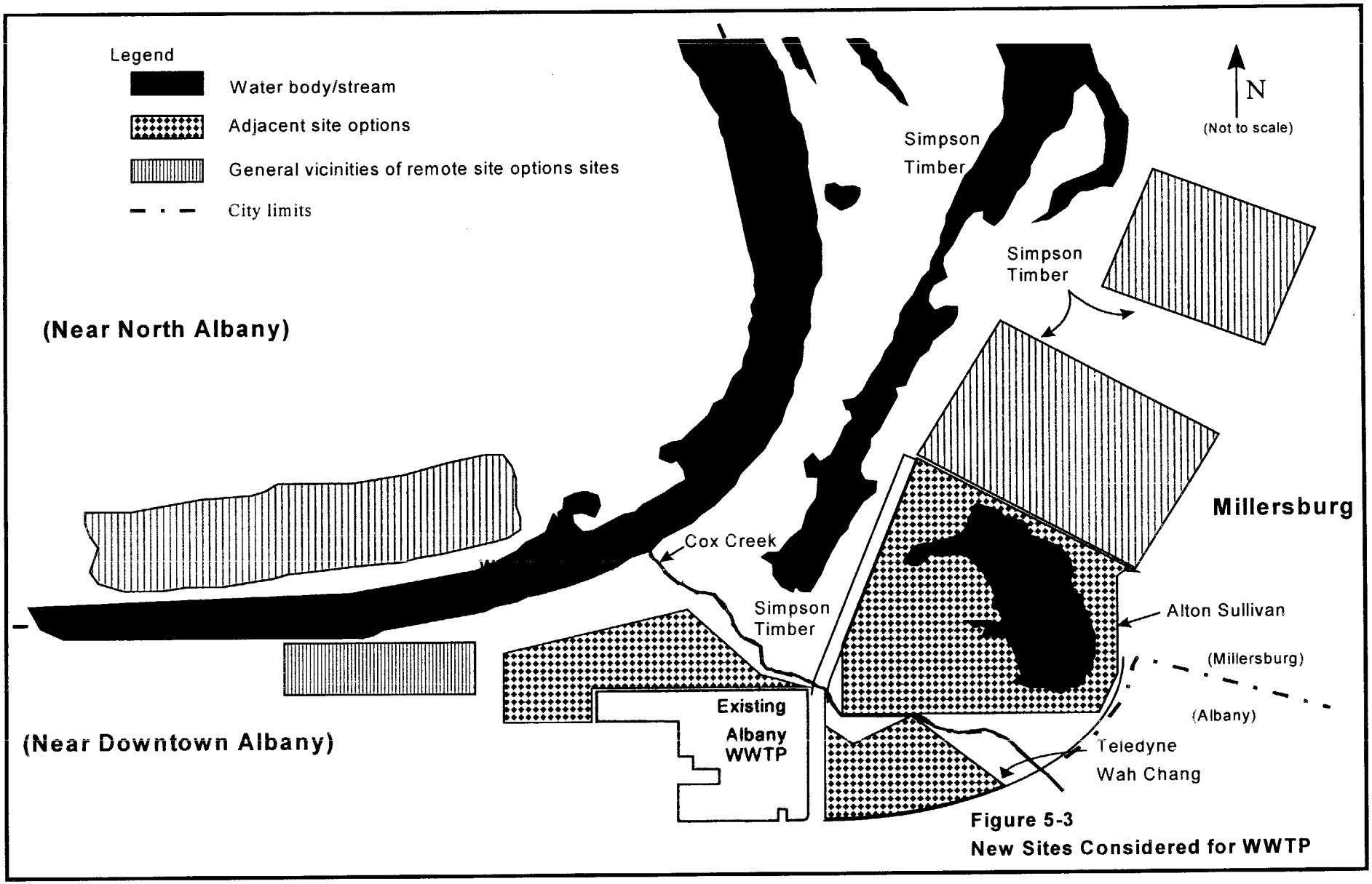


Figure 5-3
New Sites Considered for WWTP

Selection and Evaluation of Alternatives for Development

Description of Alternatives

The evaluation of the collection and treatment system alternatives, including the approaches for conveyance and storage and site locations for the Wastewater Treatment Plant, produced two final system alternatives:

- ***Alternative 1***: Convey peak flows to the existing site and provide full secondary treatment for peak wet weather peak flows.
- ***Alternative 2***: Convey peak flows to the existing site and provide partial secondary treatment for peak wet weather flows.

Non-Cost Evaluation Criteria

The major elements of the alternatives (including conveyance and treatment) were sized, and site layouts were prepared. Capital and operating and maintenance costs were estimated and compared on a present worth basis. The alternatives were also evaluated on the basis of the following non-cost criteria:

- Ease of implementation
- Energy use and resource recovery
- Future regulatory compliance
- Ease of phased construction and future expansion
- Public involvement and acceptance
- Ease of operation, maintenance, and automation
- Performance reliability
- Flexibility
- Safety and security
- Staffing
- Visual impact, noise, and odor
- Land use issues
- Recreation
- Natural habitat and wetlands

Evaluation

The present worth cost estimate of Alternative 1 ($86.2 million) was less than 5 percent higher than that of Alternative 2 ($83 million). Because Alternative 1 provides full secondary treatment to the entire plant flow, it scored high on reliability and operational simplicity.

As expected, based on the degree of treatment and the components associated with each alternative, Alternative 2 had the lower present worth cost estimate, but had more negative overall non-cost impacts. The greatest non-cost impact was the uncertain regulatory acceptance of improvements that would not provide full secondary treatment. The cost savings were afforded primarily by the reduction in the number of secondary clarifiers required. However, split stream operation can be expected to reduce performance reliability (smaller margin of safety) and to increase operational complexity (split treatment results in added operational variables).

The non-cost benefits of Alternative 1 were considered to outweigh the slightly higher present worth cost for Alternative 2. Therefore, Alternative 1 was recommended.

Section 6

Selected Improvement Strategy

Wastewater Facility Plan Improvements

The Wastewater Facility Plan identified specific capital improvements necessary to ensure Albany continues to meet state and federal permit requirements and expected growth demands. A 20-year planning window was used for the Wastewater Treatment Plant, while build out conditions were used as a planning window for the collection system.

Wastewater Collection System

Planned collection system improvements involve replacement of existing undersized sanitary sewers, expansion and construction of new sewage lift stations, and extensions of sanitary sewers. Sanitary sewer replacements and extensions were based on build out demands within the UGB because of their expected service life. Expansions of existing sewage lift stations were determined based on projected 2020 demands. New lift stations that may be needed to serve unsewered areas were also identified.

Approximately $21 million in rate and SDC-funded capital improvements to the collection system are needed to meet regulatory requirements and to serve full development within the UGB. These improvements will replace existing undersized sanitary sewers and fund the City's share of oversizing expenses for sanitary sewer extensions. Improvements to existing and construction of new lift stations needed to meet projected 2020 demands are also included in the total projected cost. Collection system improvements are summarized on Tables 6-1 through 6-3 and shown graphically on Attachments A1 and A2. Costs for sanitary sewer extensions, Table 6-3, reflect only the portion of the total project cost estimated to be eligible for City participation for oversizing.

In addition to the $21 million required to meet regulatory requirements and accommodate growth, the Task Force recommended the City adopt a perpetual life replacement program for the collection system. The recommended replacement program would be funded at $500,000 for the first year and at $1,000,000 annually thereafter for the 10-year financing window considered by the Task Force.

Table 6-1
Pipeline / Replacement Projects

Location	Cost[1]
Riverfront Interceptor – downstream of Baker Street to Geary Street	**$ 5,500,000**
Riverfront Interceptor – Calapooia Street to downstream of Baker Street	$ 1,100,000
Calapooia Interceptor – upstream of Maple Street to 12th Avenue	**$ 1,600,000**
Cox Creek Interceptor – Heatherdale Mobile Village to Salem Avenue	$ 1,900,000
28th Avenue – downstream of Geary to upstream of Jackson	**$ 500,000**
47th Avenue – west of Columbus to Columbus Street	$ 600,000
Knox Butte Road – upstream Clover Ridge Rd. to Century Dr. Pump Station	**$ 1,100,000**
Price Road – Santiam Highway to Bain Street	$ 1,900,000
Total Cost	**$14,200,000**

[1] Estimates rounded to nearest $100,000.

Lift Station Upgrades and New Lift Stations

The Wastewater Facility Plan identifies upgrades to existing lift stations needed to accommodate 2020 demands and new lift stations that may be needed by 2020 to serve unsewered areas within the UGB.

A review of the Wastewater Facility Plan was undertaken by City staff and CH2M Hill following completion of the Wastewater Facility Plan. Although the focus of this effort was to evaluate alternate methods of phasing construction at the Wastewater Treatment Plant, an option to extend the Maple Street Lift Station force main to the Riverfront Interceptor at Bowman Park was discussed. This concept may reduce the size of the replacement line for the Riverfront Interceptor.

The feasibility and cost savings related to extension of the force main as described will be reviewed in detail during predesign of the Maple Street Lift Station. Pump station improvement and replacement projects are shown in Table 6-2.

Table 6-2
New, Upgrades, and Replacement Pump Station Projects

Location / Name	Cost[1]
Pump State Upgrades and Replacement	
Oak Creek	$ 500,000
34th Avenue	$ 900,000
Charlotte Street	$ 100,000
Maple Street	$ 800,000
New Pump Stations	
Thornton Lake	$ 200,000
Columbus Street	$ 600,000
Spring Hill Drive	$ 300,000
Total Cost	**$3,400,000**

Cost Participation for Future Oversizing of Sanitary Sewer Extensions

The City may share in the cost of oversizing sanitary sewer extensions that are needed to accommodate planned growth. If available, this participation would be funded through the sewer SDC revenues and would be based on the incremental project cost difference between the size of a sanitary sewer needed to serve the development initiating the extension and the ultimate size required to accommodate full development tributary to that location.

For planning purposes, all sanitary sewer extensions greater than eight inches in diameter are assumed as oversized and the incremental cost of extending a larger diameter sewer has been calculated as an SDC eligible expense. To be eligible for oversizing participation:

- The project must be shown on Attachment A1 and A2;
- Money must be available from sewer SDC revenues; and
- The City Council must approve use of sewer SDC revenues for the project.

[1] Estimates rounded to nearest $100,000

Oversizing costs are summarized in Table 6-3 below.

Table 6-3
Oversize Cost of Sanitary Sewer Extensions (to meet build out demands)

Location	Oversize Cost[1]
North Albany, Basin 3	
Area served by Springhill Drive Lift Station	$ 680,000
Southwest Albany, Basin 8	
Area east of Highway 99E	$ 100,000
Southeast Albany, Basin 9	
Extensions on Columbus Street and on Grand Prairie Road	$ 130,000
East of I-5 along Three Lakes Road	$ 350,000
Lawndale Lift Station to Three Lakes Road	$ 480,000
Extension under I-5 to Lawndale Lift Station	$ 200,000
Northeast Albany, Basin 10	
Knox Butte Road east of Onyx Street	$ 90,000
North trunk from Charlotte Street to Century Drive	$ 770,000
Northeast Albany, Basin 11	
Extensions east of Price Road	$ 700,000
Total Oversize Cost	**$3,500,000**

Perpetual Life Replacement Program

As discussed earlier, the Task Force recommends the City adopt a perpetual life replacement program for the wastewater collection system. The Task Force recommended that the first year of the program be funded at $500,000, with each successive year for the following nine years funded at $1 million per year. This will result in a $9.5 million commitment in today's dollars through 2010, the financial planning period for the Task Force.

The Task Force further recommended that the level of investment in the replacement program be accelerated as existing and future bonded debt is retired, with the long-term program resulting in a 100-year replacement cycle. This approach involves rededicating bond debt payments to the program as debts are retired until adequate funding is available to fund a 100-year replacement cycle.

Wastewater Treatment Plant

Approximately $50 million in improvements are recommended to meet regulatory and growth needs at the Wastewater Treatment Plant through year 2020. A site layout plan showing the location of proposed improvements and their relationship to one another is included as Attachment B to this summary report. The improvements are discussed briefly below.

Influent Pump Station

The influent pump station will need to be expanded to accommodate peak instantaneous flows of 52 mgd at 2020. The existing structure will need to be expanded to accommodate pumping and additional chlorination facilities.

[1] Estimates rounded to nearest $10,000.

Septage Receiving and Storage

The Wastewater Treatment Plant does not have a facility to receive and handle septage. The Wastewater Facility Plan recommends construction of a dedicated receiving station northwest of the aeration basins as shown on Attachment B.

Headworks

An additional screen and channel upstream of the existing wastewater screen will be needed to avoid hydraulic bottlenecks as peak flows from the influent lift station increase. The existing grit chamber will need to be replaced with a larger capacity vortex grit chamber. Finally, the existing primary clarifier splitter box will need to be replaced with a six-way splitter box.

Primary Clarifiers and Sludge Pumping

The existing primary clarifiers will need to be refurbished and two 100-foot-diameter primary clarifiers added to meet 2020 demands. The existing primary sludge pumping station will need to be expanded and additional sludge and scum pumps added.

Aeration Basin

The aeration basin will need to be modified to improve processing efficiency. Aeration basin improvements will allow for increased detention time, and related improvements to the blowers will increase their efficiency.

Secondary Clarifiers and Sludge Pumping

The Wastewater Facility Plan identified the need for three secondary clarifiers to meet 2020 demands. During predesign of the biosolids dewatering and storage project, it was determined that two larger diameter secondary clarifiers would be sufficient to meet 2020 demands. The revised configuration of secondary clarifiers is shown on Attachment B. In conjunction with the clarifiers, additional raw and activated sludge pumping improvements will be needed.

Chlorination / Disinfection

This project involves construction of chlorine contact chambers and chlorine handling and storage improvements (sprinkler/scrubber systems) or construction of an alternate type of disinfection facility. The choice as to the method of disinfection will depend upon regulatory requirements when these improvements are put into service.

Outfall

Added capacity at the Wastewater Treatment Plant outfall will be needed to accommodate expected 2020 peak flows. To reach this capacity, the Wastewater Facility Plan recommends that all ports on the existing diffuser be opened, a new 54-inch outfall be constructed, and the original 48-inch outfall be refurbished to provide additional short-term capacity during peak storm events.

Solids Processing, Handling and Storage

The Wastewater Facility Plan identifies the need for an additional digester and updates to existing dissolved air floatation (DAF) solids thickening improvements. Biosolids handling and storage improvements were reviewed by Carrollo Engineers (*Biosolids Dewatering Facility, Final Design Report*, February 1999) following completion of the Wastewater Facility Plan. This predesign study found dewatered cake to be more cost effective and preferable than construction of a biosolids lagoon. Consequently, the scope and cost of the biosolids facility have been amended to reflect construction of a biosolids dewatering and cake storage facility.

Support Facilities

The Wastewater Facility Plan included costs to upgrade and expand shop and control room facilities, electrical and instrumentation improvements, and expansion of the plant water system.

Preconstruction Replacement Allowance

Based on phasing recommendations discussed in Section 7 of this Summary, an allowance of $500,000 is included to repair and replace treatment facilities that will have exceeded their service life before planned capital improvement projects are completed.

These facilities and their associated total project costs are included in Table 6-4 below. The criteria used to size them are provided in Chapter 7 of the Wastewater Facility Plan. All cost estimates reflect March 1997 construction costs and include a 25 percent allowance for contingencies and a 30 percent allowance for engineering, legal, and administrative costs.

Table 6-4
Wastewater Treatment Plant Improvements (to 2020)

Project	Description	Capital Cost[1]
Influent Pumping	Add additional pump and expand structure.	$ 5,100,000
Septage Receiving Station	Construct septage facility.	$ 500,000
Screening	Add one mechanical screen 5-foot-wide, plus structure.	$ 2,400,000
Grit Removal and Primary Influent Flow Split	Construct 20-foot-wide diameter vortex grit unit plus 6-way splitter box.	$ 1,300,000
Primary Clarifiers and Sludge Pumping	Add two 100-foot diameter clarifiers and expand primary sludge pump station.	$ 6,900,000
Aeration Basins	Plug flow and selector modifications.	$ 3,600,000
Secondary Clarifiers and RAS/WAS Pumping	Add two 135-foot diameter clarifiers. Expand RAS/WAS pump station.	$11,800,000
Chlorination	Construct two 0.545 MG CCTs. Add sprinkler and scrubber systems.	$ 6,300,000
Plant Water System	Add three 500-gpm pumps plus channel structure.	$ 500,000
Outfall	Inspect and repair 48-inch outfall. Open ports on existing diffuser. Add new 54-inch outfall.	$ 1,000,000
DAF Thickening	Upgrade thickened sludge pump. Add freeze protection and polymer blending units.	$ 300,000
Anaerobic Digestion	One new 0.75 MG digester plus associated equipment.	$ 3,100,000
Biosolids Facility	Construct new dewatering and solids handling and storage facility.	$ 5,200,000
Shop/Control Room	Shop and control room in single building.	$ 600,000
Electrical and I&C	Ongoing general electrical and I&C improvements.	$ 500,000
Pre-construction Replacement Allowance	Replace Treatment Plant equipment that wears out before planned plant expansion	$ 500,000
Total for WWTP		**$49,600,000**

[1] Estimates rounded to nearest $100,000.

Section 7

Implementation

Criteria

The various components of the selected alternative were developed into an implementation plan to do the following:

- Rank and schedule improvements by priority
- Match improvements with regulatory deadlines
- Address logistical concerns
- Group similar upgrades and expansions into integrated projects
- Phase projects to correspond with the City's projected financial capabilities
- Provide a basis for the formulation of the City's Capital Improvement Program (CIP)

Assumptions

The following assumptions were fundamental to the development of a phasing plan:

- The City will be successful in working with DEQ to obtain an exemption to the 85 percent BOD and TSS removal requirement during wet weather
- The City will be successful in working with EQC to obtain mass load increases for BOD and TSS loads for future flows.
- Compliance with basin standards for BOD and TSS concentrations will not be required until improvements that increase the plant's dry weather capacity are made.
- The final pace of improvements to the wastewater system will be affected by the City's financial resources.

Phasing Capital Improvements

The Task Force considered two alternative construction schedules that would meet the 2010 regulatory deadlines for reduction of sanitary sewer overflows to the Calapooia and Willamette Rivers. The schedule options were developed as part of a review of the Wastewater Facility Plan by City staff and CH2M Hill.

Alternative 1 involves a single construction phase for the Wastewater Treatment Plant improvements between 2007 and 2009, and near-term improvements to the collection system. The near-term improvements would minimize sewer overflows to the Calapooia River in advance of the 2010 deadline. The Treatment Plant improvements would meet the regulatory deadline for the Willamette River. Table 7-1 below summaries the schedule of improvements under Alternative 1.

Table 7-1
Alternative 1 – Single-Phase Construction

Stage	Timing
Revenue Bond Authorization	January – April 2004
Predesign/Design/Bid	January – December 2005
Bond Sale	Fall 2006
Award	January 2007
Start Construction	Spring 2007
Improvements On-Line	January 2009

Alternative 2 includes two treatment construction phases that would place part of the Wastewater Treatment Plant improvements on-line earlier, but would be less aggressive regarding removing overflows from the Calapooia River. The first phase would occur between 2003 through 2004 and would add more primary treatment capacity. The second phase would occur between 2007 and 2009 and would complete treatment and collection system improvements needed to meet regulatory requirements in 2010. This approach would lessen the extent and duration of overflows to the Willamette River before the 2010 deadline, but would be more costly than Alternate 1 and would not achieve regulatory compliance for the Willamette or Calapooia Rivers until 2010. The schedule of improvements for Alternative 2 are shown in Table 7-2 below:

Table 7-2
Alternative 2 – Two-Phase Construction

Stage	Timing
Phase I	
Revenue Bond Authorization Phase I	Summer 2001
Predesign/Design/Bid Phase I	January – December 2002
Bond Sale	2002 – 2003
Award Phase I	Spring 2003
Start Construction Phase I	Summer 2003
Primary Improvements On-line Phase I	Fall 2004
Phase II	
Revenue Bond Authorization Phase II	Summer 2005
Predesign/Design/Bid Phase II	January – December 2006
Bond Sale	2006 – 2007
Award Phase II	Spring 2007
Start Construction Phase II	Summer 2007
Secondary Improvements On-line Phase II	January 2009

The Task Force considered the following factors in evaluating the two phasing alternatives:

- Water quality
- Cost (based on present worth of each option)
- Disruption of the Wastewater Treatment Plant and surrounding neighborhood
- Regulatory environment

Staff noted that some time-critical operation and maintenance improvements would be needed at the Wastewater Treatment Plant under the single-phase approach. These include $500,000 for replacement of worn-out equipment that may not last until the planned improvement projects are constructed.

The Task Force recommended Alternative 1, construction as a single-phase improvement and that $500,000 in today's dollars be included to cover existing needs prior to the construction of the major Wastewater Treatment Plant improvements. Alternative 1 was favored because it:

- *Addresses the greatest water quality concerns first.* Removing overflows from the Calapooia River first was seen as an advantage because of the impact the overflows have on the relatively low flows in the Calapooia River and because of the health risks associated with the downstream use of public parks. In addition, two species of salmonids have been listed in the Upper Willamette Basin, which includes the Calapooia River, and removal of these overflows may help address requirements under the Endangered Species Act.
- *Costs ratepayers approximately $7.3 million less than Alternative 2 (when compared on a present worth basis).* The lower cost is due to economies of scale in design and construction of facilities in a single-phase and the ability to defer capital expenses.
- *Minimizes the duration and severity of construction-related impacts.* Disruption of operations at the Wastewater Treatment Plant and to the surrounding neighborhood is minimized by constructing improvements over a shorter period of time and under one contract. Interim improvements needed to bridge operation of the Wastewater Treatment Plant between two phases of construction are also avoided.

Table 7-3 below summarizes recommended capital improvements recommended by the Task Force through year 2010. These projects and their corresponding capital costs were used as the basis for rate and SDC recommendations presented by the Task Force and are a subset of the Wastewater Facility Plan recommended improvements through year 2020.

Table 7-3
Capital Improvements through 2010

Project	Cost ($M 1997)[1]
Treatment[2]	
Influent Pump Station	$ 5.1
Screening Facility/Grit Chamber	3.7
Primary & Secondary Clarifiers	18.7
Aeration Basin Improvements	3.6
Disinfection Improvements/Outfall	7.3
Solids Handling/Digestion	3.9
Support Improvements	1.6
Subtotal Treatment (Rounded)	$44.0
Collection	
Interceptor & Trunk Improvements	$ 5.7
Pump Station Replacements	3.5
New Pump Stations	0.3
Subtotal Collection	$9.5
Total Facility Plan (through 2010)	***$53.5***
Perpetual Life Replacement Program	*9.5*
Preconstruction Treatment Plant Allowance	*0.5*
Total Capital Need (through 2010)	***$63.5***

The proposed financial plan recommended by the Task Force is based these improvements constructed in accordance with schedule Alternative 1. However, it should be noted that the City is still awaiting approval from DEQ on this schedule.

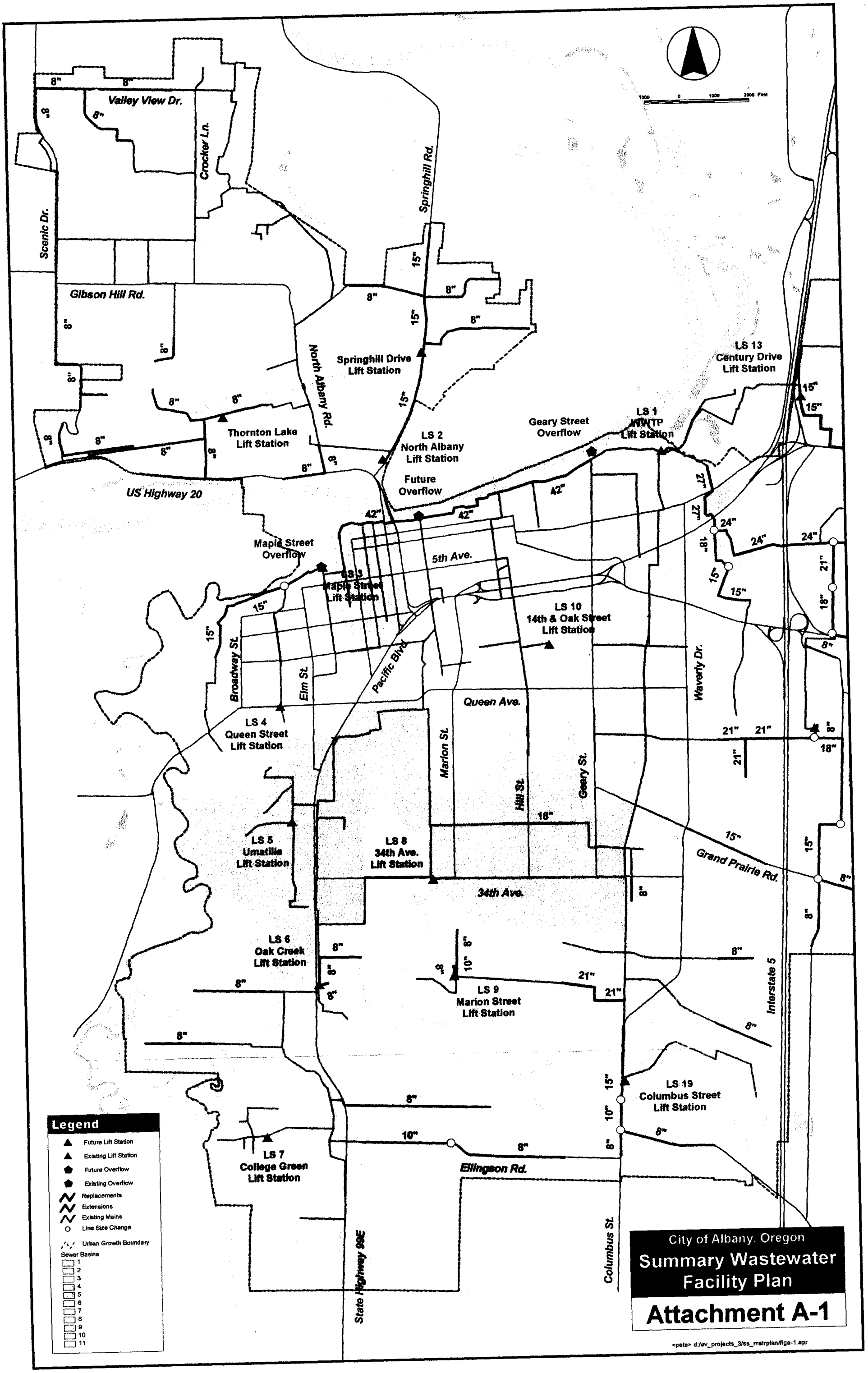
[1] Estimates rounded to nearest $100,000.

[2] The biosolids dewatering and storage facility is now under construction and consequently is not included with the list of planned projects.

Attachments

Attachment A1 and A2 – Conveyance System Improvement Maps

Attachment B – Wastewater Treatment Plant Improvement Map


Valley View Dr.
Crocker Ln.
Springhill Rd.
Scenic Dr.
Gibson Hill Rd.
North Albany Rd.
Springhill Drive Lift Station
Thornton Lake Lift Station
LS 2 North Albany Lift Station
Future Overflow
Geary Street Overflow
LS 1 WWTP Lift Station
LS 13 Century Drive Lift Station
US Highway 20
Maple Street Overflow
LS 3 Maple Street Lift Station
5th Ave.
LS 10 14th & Oak Street Lift Station
Broadway St.
Elm St.
Pacific Blvd
Waverly Dr.
Queen Ave.
LS 4 Queen Street Lift Station
Marion St.
Hill St.
Geary St.
LS 5 Umatilla Lift Station
LS 8 34th Ave. Lift Station
34th Ave.
Grand Prairie Rd.
LS 6 Oak Creek Lift Station
LS 9 Marion Street Lift Station
Interstate 5
LS 19 Columbus Street Lift Station
LS 7 College Green Lift Station
Ellingson Rd.
State Highway 99E
Columbus St.
Legend
Future Lift Station
Existing Lift Station
Future Overflow
Existing Overflow
Replacements
Extensions
Existing Mains
Line Size Change
Urban Growth Boundary
Sewer Basins
1
2
3
4
5
6
7
8
9
10
11
City of Albany, Oregon
Summary Wastewater Facility Plan
Attachment A-1
<pete> d:/av_projects_3/ss_mstrplan/figa-1.apr

City of Albany, Oregon
Summary Wastewater Facility Plan
Attachment B

<pete> d:/ev_projects_3/ea_mstrplan/attachment_b.apr

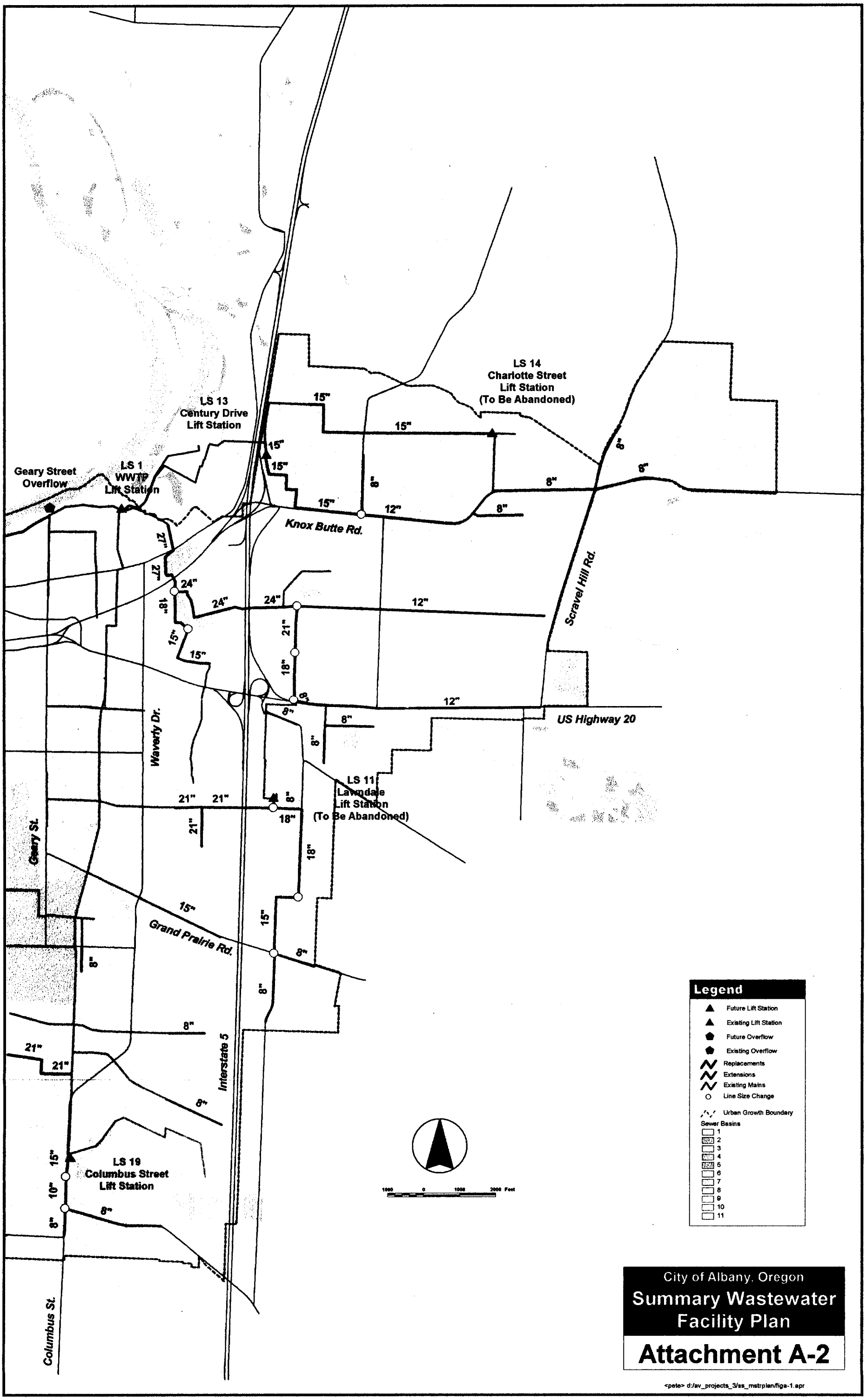
Willamette River

Construct by 2010
Construct to Serve Buildout of UGB
City Property
Private Property

100 0 100 200 Feet

1 Rehab / Modify Existing Outfalls
2 New 54" Outfall
3 Chlorine Contact Tank
4 Pump Capacity Upgrade & Wet Well Expansion
5 Chlorine Storage Expansion
6 Chlorine Scrubber
7 Convert to Primary Clarifiers
8 Upgrade Reclaimed Water System
9 Secondary Clarifiers
10 RAS / WAS Pump Station
11 Septage Receiving Facility
12 Screening Expansion
13 Grit Removal Modifications
14 Primary Influent Splitter Box
15 Primary Clarifiers
16 Biosolids Dewatering & Cake Storage
17 Aeration Basin Improvement & Expansion
18 Upgrade DAF Thickener
19 Primary Digesters
20 Demolish Existing Digesters
Possible Location for Shop Control Room
21 Admin. Bldg. Improvements

LINN AVE.
WILLAMETTE AVE.
FRONT AVE.
COLUMBUS ST.
DAVIDSON ST.
WAVERLY DR.



City of Albany, Oregon

Summary Wastewater Facility Plan

Attachment A-2

<pete> d:/av_projects_3/ss_mstrplan/figa-1.apr

DELETE AND REPLACE WITH NEW

EXHIBIT C

GOAL 11: PUBLIC FACILITIES AND SERVICES

WASTEWATER TREATMENT BACKGROUND SUMMARY

The existing Albany Wastewater Treatment Plant was originally constructed in 1952. In 1969 the plant was expanded and upgraded to an 8.7 million gallon per day (mgd) secondary treatment (activated sludge) facility designed to treat both municipal wastewater and seasonal high-strength industrial wastewater from local food processors. The Albany Wastewater Treatment Plant operates under a waste discharge permit issued by the Oregon Department of Environmental Quality. Treated effluent from the plant is discharged to the Willamette River. Stabilized waste sludge from the treatment process is applied to local farmland for agricultural utilization by a private contract hauler.

The plant presently provides treatment for domestic, commercial, and industrial wastewaters from the city of Albany and domestic wastes from the city of Millersburg. The rest of the Albany Urban Growth Boundary is served by individual on-site systems with the exception of the Riverview Heights treatment plant in North Albany. Since 1982, the Albany plant has largely discontinued treatment of high-strength, seasonal food processing wastewater as separate land application treatment/disposal of this industrial wastewater by the private sector has proven to be economically attractive.

Flows treated at the plant vary considerably throughout the year due to varying rates of infiltration/inflow (I/I) entering the collection system from groundwater and surface runoff sources. During the dry weather period of June through October, the plant treats an approximate average volume of 4.5 mgd, which is less than the original 8.7 mgd design capacity. However, during the wet weather periods of the year (November through May), waste flow treated at the plant has averaged approximately 7.8 mgd. The plant has treated a maximum of approximately 17 mgd due to I/I entering the wastewater collection system and due to direct discharge of stormwater via remaining combined sanitary sewer and storm sewer systems and via direct private storm drain connections.

The hydraulic capacity of the existing treatment plant is not sufficient to treat the total collection system flows during the high groundwater, high rainfall periods of the year due to the I/I problem. This results in periodic, untreated, collection system overflows to the Willamette River. To reduce this problem, the City has a continuing program to separate storm and sanitary sewers.

Portions of the North Albany area are characterized by septic tank failures and resulting contamination of drainageways and pollution of the groundwater. In addition, the Riverview Heights Treatment Plant serving over 160 homes in North Albany no longer meets the Department of Environmental Quality (DEQ) standards. The future of the North Albany area sewer problems and potential solutions are being dealt with by Benton County, the City of Albany, the DEQ, and the North Albany citizens. Although a number of approaches could solve these problems, a collection system with treatment at the City's sewer plant appears to currently be the best long-term solution.

One means of ensuring adequate treatment capacity for future domestic waste is by minimizing the strength or amount of industrial wastes discharged to the sewage treatment plant. This can be accomplished by requiring industrial users to pretreat or completely treat their liquid wastes. Thus, the City could increase residential capacity of the plant by decreasing industrial demand; however, the economic impacts of placing additional treatment burdens on local industry is a factor which must be considered as well.

DELETE AND REPLACE WITH NEW

GOAL 11: PUBLIC FACILITIES AND SERVICES

WASTEWATER TREATMENT
POLICIES AND IMPLEMENTATION METHODS

GOAL: Provide and maintain wastewater facilities and services in an orderly and efficient manner.

POLICIES:

1. Size sanitary sewers to provide for projected growth within the Urban Growth Boundary based upon the population projections and land use designations of the Comprehensive Plan and completion of the design guidelines of the Public Facilities Plan.

2. Review and regulate development proposals to ensure adequate wastewater service improvements will be provided to the development and to future developments and ensure that adequate assurances have been secured for participation in the public system when these services become available.

3. Prioritize extension of sanitary sewer service as follows:

   a. Declared health hazard areas within the city limits.
   b. Declared health hazard areas within the Urban Growth Boundary.
   c. Properties within the city limits of Albany.
   d. Unincorporated buildable lands within the Albany Urban Growth Boundary, where there is an agreement to annex.
   e. Other incorporated cities.

   Base criteria for extension of service on findings that provision of service to low priority areas will not impair the City's ability to serve a higher priority area and in recognition of the City's contractual service obligations.

4. Require execution of annexation or consent to annex agreements to receive sewer service in unincorporated areas.

5. Prevent the development or expansion of "stand alone" wastewater treatment plant systems within the Urban Growth Boundary that are not planned as part of the City's facility.

6. Require that developments extending wastewater collection facilities pay an equitable share of the costs. This may include:

   a. A system connection fee based on the number of residential units constructed or some other equivalent for commercial or industrial developments.
   b. The developer pays for extension costs with the provision that during a five-year period the developer be reimbursed by subsequent connection fees collected from new customers served by the system extension.
   c. The developer pays for oversizing and is partly reimbursed as subsequent connections are made to the system extension for a fixed period.
   d. The City pays an equitable portion of the extension costs based on adoption of an ordinance which establishes a recognized funding program and mechanism.

7. Periodically review the sewer revenues and maintain a fee schedule which ensures that the revenues generated are adequate to meet operating and maintenance costs and implement those projects identified within the capital improvements program for sewer main extension and wastewater treatment plant expansion.

8. Continue to develop specific plans and funding mechanisms for expansion of the wastewater treatment plant which includes proposed resolution of domestic wastewater treatment for the city of Millersburg, North Albany, and other expanding areas of the Urban Growth Boundary.

9. Discourage the construction of structures over public wastewater lines and easements.

10. Encourage the use of conservation techniques and devices that reduce the amount of wastewater discharged into the City sanitary sewer system.

11. Continue to update, improve, and expand participation in the City's industrial wastewater pretreatment program, for all industrial wastewater generators, to ensure compliance with Oregon Department of Environmental Quality, Environmental Protection Agency and the City of Albany industrial wastewater pretreatment standards.

12. Continue a program for eliminating direct discharge and infiltration of storm and groundwater into the sanitary sewer system.

13. Explore sludge disposal options that:

    a. Are cost effective and environmentally sound.
    b. Provide viable long-term disposal opportunities.
    c. Make productive use of sludge.

IMPLEMENTATION METHODS:

1. Develop regulations that prohibit buildings from being sited over existing wastewater collection lines.

2. Continue the policy of charging property owners outside the city limits a higher monthly rate and implement an ordinance requiring similarly higher hook-up fees.

3. Develop procedures for working with Millersburg and other jurisdictions to coordinate effective and efficient service considerations.

4. Update the Albany-Millersburg wastewater treatment contractual agreement to require Millersburg to notify the City of Albany and receive subsequent approval prior to connection to any portion of the wastewater collection system.

5. Develop regulations for the establishment of funding mechanisms that ensure that new developments pay an equitable portion of the costs associated with extending the service.

RECOMMENDATIONS:

1. Encourage Linn and Benton Counties to advise property owners within the Urban Growth Boundary who propose to install new or replacement septic systems that they may be required to hook up to sanitary sewer when their property is annexed to the city even if there are no documented problems with the existing system.

2. Request that the City of Millersburg notify the City of Albany of all applications to connect to any portion of the wastewater collection system.

3. Encourage Linn and Benton Counties to stop issuing new septic tank permits in the urban growth boundary area where there have been recorded septic system failures or documented aquifer pollution.

NEW

GOAL 11: PUBLIC FACILITIES AND SERVICES

WASTEWATER SYSTEM
BACKGROUND SUMMARY

The existing Albany Wastewater Treatment Plant was originally constructed in 1952. In 1969, the plant was expanded and upgraded to an 8.7 million gallon per day (mgd) secondary treatment (activated sludge) facility designed to treat both municipal wastewater and seasonal high-strength industrial wastewater from local food processors. The influent lift station was expanded, a diffuser added and solids handling improvements were completed in the early 1990's. Although these improvements met regulatory requirements and improved solids treatment at the plant, they did not increase the plant's capacity. The Albany Wastewater Treatment Plant operates under a waste discharge permit issued by the Oregon Department of Environmental Quality. Treated effluent from the plant is discharged to the Willamette River. Stabilized biosolids from the treatment process are applied to local farmland for beneficial uses.

The plant presently provides treatment for domestic, commercial, and industrial wastewaters from the city of Albany and domestic wastes from the city of Millersburg. The rest of the developed property within the Albany Urban Growth Boundary is served by individual on-site systems.

Flows treated at the plant vary considerably throughout the year due to varying rates of infiltration/inflow (I/I) entering the collection system from groundwater and surface runoff sources. During the dry weather period of June through October, the plant treats an approximate average volume of 6.9 mgd (1998), which is less than the current 8.7 mgd dry weather design capacity. However, during the wet weather periods of the year (November through May), waste flow treated at the plant has averaged approximately 12.7 mgd (1998). The plant has frequently treated a maximum of approximately 20-mgd (maximum wet weather capacity) due to I/I entering the wastewater collection system.

The hydraulic capacity of the existing treatment plant is not sufficient to treat the total collection system flows during the high groundwater, high rainfall periods of the year due to the I/I problem. The current peak design wet weather flow is approximately 40 mgd and consequently peak flows overload the wastewater system and result in overflows of wastewater to the Willamette and Calapooia Rivers.

In 1991 sanitary sewers were extended to the serve approximately 565 properties in North Albany that had been declared a health hazard by the Oregon State Health Division. The health hazard area represented only a portion of the developed area in North Albany. The Health Division concluded a health risk existed due to failing septic tank drainfield systems that contaminated drainageways and groundwater

Other significant collection system improvements completed recently include replacement of potions of the Calapooia Interceptor, addition of the Columbus Street Sewage Lift Station and extensions of trunk and collector sewers to serve new development.

NEW

GOAL 11: PUBLIC FACILITIES AND SERVICES

WASTEWATER SYSTEM
POLICIES AND IMPLEMENTATION METHODS

GOAL: Provide and maintain wastewater facilities and services in an orderly and efficient manner that reflects the community's environmental stewardship responsibilities and meets regulatory requirements.

POLICIES: It shall be the policy of the City of Albany that:

1. The *1998 Wastewater Facility Plan Summary* (*Summary*) shall be the primary document for planning the community's wastewater system improvements.

2. The basic concept of the wastewater system is a gravity system. Pump stations and force mains will be minimized and will not be allowed unless approved by the Public Works Director (PWD).

3. Review and regulate development proposals to ensure adequate wastewater service improvements will be provided to the development and to future developments and ensure that adequate assurances have been secured for participation in the public system when these services become available.

4. Capital improvements to the wastewater systems will be prioritized based on the following criteria:

    a. Projects needed to meet regulatory requirements for improving water quality;
    b. Projects needed to maintain capacity and reliability of critical system components, such as pump stations and structural integrity of sewer lines;
    c. Projects related to street improvements;
    d. Projects needed to eliminate or reduce basement flooding;
    e. Projects needed to reduce inflow and infiltration, and
    f. Projects related to other issues such as alleviating health hazards

    These criteria are not necessarily ranked in order of priority.

5. Extensions of service shall be based on findings that provision of service to low priority areas will not impair the City's ability to accommodate higher priority wastewater system needs including recognition of the City's contractual service obligations.

6. Annexation is required to receive sewer service in unincorporated areas within the Urban Growth Boundary. Consequently, sewer service shall not be provided outside Albany's city limits, except as provided by specific contracts with the City of Millersburg, Oak View elementary school, Spring Hill Country Club or as authorized by the Albany City Council.

7. Development or expansion of "stand alone" wastewater treatment plant systems shall not be allowed within the Urban Growth Boundary that are not planned as part of the City's facility.

8. Developments extending wastewater collection facilities pay an equitable share of the costs. This may include:

a. A systems development charge (SDC) based on the number of residential units constructed or some other equivalent for commercial or industrial developments;
b. Payment for extension costs with the provision that the developer maybe partially reimbursed in accordance with City Council Policy, and
c. Payment for oversizing with the provision that the developer may be partially reimbursed in accordance with City Council Policy.

9. Sewer revenues will be periodically reviewed to maintain rate and fee schedules that ensure adequate revenue is generated to meet operating and maintenance costs, debt service requirements and capital improvement needs.

10. The City will continue to develop specific plans and funding mechanisms for expansion of the wastewater treatment plant.

11. Construction of structures over public wastewater lines and easements is prohibited.

12. The City shall encourage the use of conservation techniques and devices that reduce the amount of wastewater discharged into the City sanitary sewer system.

13. The City shall continue to update, improve, and expand participation in the City's industrial wastewater pretreatment program for industrial wastewater generators. The City shall continue to develop pollution prevention programs and ensure compliance with Oregon Department of Environmental Quality, Environmental Protection Agency and the City of Albany industrial wastewater pretreatment standards.

14. The City shall continue a program for eliminating discharge and infiltration of storm and groundwater into the sanitary sewer system.

15. The City shall continue to develop beneficial uses for the application of biosolids that:

a. Are cost effective and environmentally sound;
b. Provide viable long-term beneficial use opportunities, and
c. Make productive use of biosolids.

IMPLEMENTATION METHODS:

1. Continue the policy of charging property owners outside the city limits a higher monthly rate.

2. Develop procedures for working with Millersburg and other jurisdictions to coordinate effective and efficient service delivery options that equitably distribute improvement costs to add capacity and meet regulatory requirements.

3. Ensure that new developments pay an equitable portion of the costs associated with expanding the wastewater treatment plant and extending sanitary sewer service.

NEW

RECOMMENDATIONS:

1. Encourage Linn and Benton Counties to advise property owners within the Urban Growth Boundary who propose to install new or replacement septic systems that they may be required to hook up to sanitary sewer when their property is annexed to the city even if there are no documented problems with the existing system.

2. Encourage Linn and Benton Counties to stop issuing new septic tank permits in the urban growth boundary area where there have been recorded septic system failures or documented aquifer pollution.

EXHIBIT D

WASTEWATER FACILITY PLAN
WASTEWATER COLLECTION
LIST OF PROJECTS

COST-EFFECTIVE (I/I) REDUCTION

A cost-effective analysis, identified 3 basins of the 11 existing sewered basins as being economical to rehabilitate for the purpose of reducing existing levels of infiltration/inflow (I/I). These basins are illustrated in Table VI-11.

The recommended I/I reduction program for these three basins consists of source detection and subsequent sewer rehabilitation for reducing existing levels of I/I.

TABLE VI-11 **RECOMMENDED COST-EFFECTIVE I/I REDUCTION**

REHABILITATION ESTIMATED COSTS

BASIN	SOURCE DETECTION COSTS	SEWER LINE	LATERALS	TOTAL COST
004	$ 87,000	$1,216,000	$882,000	$2,085,000
005	41,000	595,000	470,000	1,106,000
011	46,000	665,000	525,000	1,236,000
TOTALS	$174,000	$2,376,000	$1,877,000	$4,427,000

CAPACITY IMPROVEMENTS

Capacity deficiencies in the existing collection system were identified by the systems analysis mode (SAM), assuming cost-effective reduction of existing levels of I/I.

The systems analysis model identified capacity limitations in the existing system and calculated required improvements for individual pipeline segments of the collection system. Improvements to correct capacity deficiencies include either pipeline replacement or parallel sewer construction. Table VI-12 summarizes recommended system capacity improvements.

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

TABLE VI-12

WASTEWATER FACILITY PLAN

RECOMMEND EXISTING SYSTEM CAPACITY IMPROVEMENTS[a]

Stage	Basin	Segment[b]	Upstream	Downstream	Description	Proposed Improvement Diameter (inches)	Length (feet)	Design Flow (mgd)	Estimated Capital Cost ($)
Stage I	001	8.70	621906	621905	Replace	18	255	1.7	$ 33,000
	002	8.40	641903	641904	Replace	21	109	2.9	22,000
	002	8.40	641904	641906	Replace	24	191	2.9	49,000
	002	8.30	641906	641909	Replace	18	212	3.7	32,000
	005	7.60	581930	581931	Parallel	18	194	2.1	25,000
	006	8.00	642202	642202A	Parallel	30	86	4.5	31,000
	006	7.00	642206	642208	Parallel	24	646	14.9	179,000
	006	7.00	642209	642211	Parallel	24	265	7.0	73,000
	007	4.00	642503	662502	Replace	54	1,064	18.6	699,000
	007	6.00	642212	642213	Replace	48	317	15.2	186,000
	007	5.00	642213	642214	Parallel	27	200	15.2	65,000
	007	5.00	642214	642215	Parallel	30	414	15.3	151,000
	011	0.20	643119	643136	Replace	21	1,612	3.2	340,000
Subtotal Stage I									$1,885,000
Stage II	001	8.70	621905	621904	Replace	18	250	1.7	$ 32,000
	002	8.20	641909	641910	Parallel	15	211	4.3	36,000
	006	8.00	642202A	642204	Replace	33	14	5.5	5,000
	006	7.00	642205A	642206	Parallel	21	323	14.6	80,000
	006	7.00	642208	642209	Parallel	24	156	7.0	43,000
	007	3.00	662502	662509	Parallel	24	969	19.3	239,000
	007	3.00	662509	662511	Parallel	27	862	19.4	224,000
	008				Expand Oak Crk. P.S.				306,000
	008				Expand 34th St. P.S.				330,000
	011	1.00	662805	662806	Parallel	33	50	37.2	20,000
	011	0.00	662806	662888	Parallel	36	26	42.1	11,000
	011	0.30	603404	603403	Replace	10	370	0.6	32,000
	011	0.30	623402	643418	Parallel	8	966	1.4	44,000
	011	0.20	653418A	643119	Replace	18	1,671	2.7	299,000
	011	0.10	643136	643128	Replace	24	1,468	5.0	293,000
	011	0.10	643128	663104	Parallel	8	565	5.2	26,000
	011	0.10	663106	662809	Parallel	24	551	5.5	35,000
Subtotal Stage II									$2,055,000
Stage III	008	Expand Oak Crk. P.S. Force Main							$ 204,000
	008	Expand 34th St. P.S. Force Main							164,000
Subtotal Stage III									$ 368,000
Totals (all stages)									$4,308,000

[a] Assumes C-E I/I reduction in Basin Nos. 004, 005, and 011.
[b] Segment designation in SAM

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

FUTURE EXTENSIONS

Future trunk sewer extensions to serve presently unsewered areas within the Albany Urban Growth Boundary (exclusive of North Albany) are shown in Table VI-13. Table VI-13 presents the estimated costs for the future trunk sewer extensions.

The location and sizing of future trunk sewer extensions to serve the outlying areas were determined by examination of topographic maps. Trunk sewer extensions were assumed to follow existing roads or right-of-ways. The extensions were developed to minimize pumping wherever possible. The locations and sizing of the trunk sewer extensions presented in this report are based on preliminary facility planning assumptions. Actual routing and sizing of the trunk sewer extensions should be refined pending design phase site surveys, evaluation of utility conflicts, and right-of-way acquisition.

PREVENTIVE MAINTENANCE

An important component of any utility system is a program for long-term preventive maintenance management. Sections of this chapter identify programs for eliminating excessive I/I and correcting capacity deficiency problems. These improvements will meet the City's immediate needs. However, to prevent future deterioration of the system and to protect the City's substantial investment (approximately $30 million) in the existing collection system, a long-term preventive maintenance program is recommended. Unless the system is properly maintained, deterioration of existing sewers will accelerate.

Table VI-14 presents a recommended preventive maintenance program for the City of Albany collection system to be instituted during the 20-year planning period. The recommended maintenance activities include routine cleaning and inspection, I/I source detection, rehabilitation, and cyclic replacements. Estimated costs of this program are presented in Table VI-14.

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

TABLE VI-13 WASTEWATER FACILITY PLAN

RECOMMENDED FUTURE TRUNK SEWER EXTENSIONS[a]

	Stage II			Stage III			
Project Designation	Diameter (inches)	Length (feet)	Estimated Cost ($)	Diameter (inches)	Length (feet)	Estimated Cost ($)	Total Estimated Cost ($)
12 A	15	2,700	190,000	15	2,800	197,000	387,000
12 B	8	1,300	57,000				57,000
12 C				8	2,700	128,000	128,000
12 D				8	2,600	124,000	124,000
12 E				8	2,500	80,000	80,000
12 F				12	4,400	253,000	253,000
12 G				15	6,000	629,000	629,000
12 H	18	4,400	534,000	15	1,200	115,000	649,000
				12	2,300	179,000	179,000
12 I				12	4,300	368,000	368,000
13 A	8	1,200	38,000				38,000
13 B	8	1,700	54,000				54,000
13 C	8	3,000	96,000				96,000
13 D	8	800	26,000				26,000
13 E				8	1,200	38,000	38,000
13 F				8	1,000	32,000	32,000
13 G				8	1,800	58,000	58,000
13 H				8	4,000	128,000	128,000
13 I				10	2,200	146,000	146,000
				8	5,200	249,000	249,000
				Pump Station		98,000	98,000
				Force Main		62,000	62,000
13 J	10	3,500	155,000	8	3,100	99,000	254,000
13 K	8	3,600	115,000				115,000
14 A				8	2,000	87,000	87,000
14 B				8	1,500	48,000	48,000
14 C				8	2,900	93,000	93,000
14 D				8	1,400	61,000	61,000
14 E				8	3,100	99,000	99,000
14 F				8	1,000	32,000	32,000
14 G				8	2,400	77,000	77,000
14 H				8	1,400	45,000	45,000
14 I				10	3,850	255,000	255,000
Totals			1,265,000			3,780,000	5,045,000

[a]Excludes north Albany.

CVR28/052

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

TABLE VI-14 WASTEWATER FACILITY PLAN

RECOMMENDED PREVENTIVE MAINTENANCE PROGRAM

Maintenance Activity[a]	Unit Cost	Frequency (years)	Estimated[b] Total Annual Cost ($/year)
Routine Maintenance			
Cleaning and Inspection	$1.00/lf	5	120,000
I/I Source Detection			
Flow Isolation	$25/manhole	1	25,000
Manhole Inspection	$25/manhole	5	10,000
TV Inspection	$1.50/lf	5	54,000
Smoke Testing	$0.25/lf	5	31,000
Subtotal			120,000
Rehabilitation			
Sealing	$8.4/lf	100	51,000
Sliplining	$32.6/lf	100	199,000
Subtotal			250,000
Cyclic Replacement	$106/lf	100	647,000
TOTAL			1,137,000

[a] Data management costs are included in the unit cost for each activity.

[b] Calculations based on the following:

- Total length of sewer = 610,600 lf
- Total number of manholes and cleanouts = 2,000
- TV inspection of 30 percent of the sewers
- Flow isolation of 50 percent of the manholes

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

WASTEWATER FACILITY PLAN

STAGED IMPLEMENTATION

Table VI-15 summarizes the recommended staged capital improvement plan for the Albany wastewater collection system. The 20-year plan has been divided into three stages.

STAGE I

Stage I (1987-91) represents an initial 5-year "catch-up" program for cost-effective reduction of existing infiltration/inflow and correction of existing capacity deficiencies. Annual maintenance expenditures are also included in the initial Stage I plans.

The cost-effective infiltration/inflow (I/I) reduction program for three sewer basins is recommended to be implemented during Stage I. Stage I capital improvements also include correction of existing critical capacity deficiencies within the collection system.

STAGE II

Stage II Years 1992-96) capital improvements consist of continued correction of existing system capacity deficiencies plus a budgeted allowance for future trunk sewer extensions to serve presently unsewered areas within the study area. Also included as part of the Stage II program is an expanded annual budget for preventive maintenance.

Stage II capacity improvements continue the work begun in Stage I. In this stage, capacity improvements are proposed for pipe segments where the existing peak wet weather flows exceed the pipeline capacity by more than 110 percent.

STAGE III

Stage III capital improvements provide relief for existing facilities whose capacities will be exceeded by peak wet weather flows occurring during the period of 1997-2005 in addition to budgeting for future sewer extensions to serve presently undeveloped areas within the study area. A continued program of expanded preventive maintenance activities is also included during Stage III.

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

TABLE VI-15 **WASTEWATER FACILITY PLAN**

RECOMMENDED STAGED CAPITAL IMPROVEMENT PLAN

	Stage I (1987-1991)	Stage II (1992-1996)	Stage III (1997-2005)	Totals ($)
Capital Improvements				
Cost-effective I/I removal	$4,427,000	$ 0	$ 0	$ 4,427,000
Existing system capacity improvements	1,885,000	2,055,000	368,000	4,308,000
New trunk sewer extensions[b]	0	1,265,000	3,780,000	5,045,000
Subtotals	$6,312,000	$3,320,000	$4,148,000	$13,780,000
Equivalent annual expenditures ($/year)	1,262,400	664,000	460,900	
Annual Routine Maintenance ($/year)				
Cleaning & Inspection	$ 120,000	$ 120,000	$ 120,000	
Source Detection	120,000	120,000	120,000	
Sewer Rehabilitation	120,000	250,000	250,000	
Sewer Replacements	133,000	647,000	647,000	
Subtotals	$493,000	$1,137,000	$1,137,000	
Total Annual Expenditures ($/yr) (Capital Plus Annual Maintenance)	$1,755,400	$1,801,000	$1,597,900	

[a] Order-of-magnitude cost estimates based on ENR CCI = 4,600 (1986 dollars)

[b] Excludes North Albany

[c] City of Albany's existing collection system budget including contract repairs

CVR28/054

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

WASTEWATER FACILITY PLAN

WASTEWATER TREATMENT

IMPLEMENTATION

An implementation schedule and estimated project costs for the recommended staged construction of interim and long-range improvements are summarized in Table VI-16. The recommended improvements are grouped into four interim improvement project stages (Stages A, B, C, & D) and one long-range staged improvement (Stage E).

Interim improvements contained in Project Stages A, B, and C are high-priority items. These immediate, interim modifications function to improve treatment system reliability; prevent catastrophic breakdown of existing, antiquated equipment; and/or are estimated to effect considerable savings in operation and maintenance.

Interim improvements identified in Stage D primarily serve to increase the wet-weather treatment capacity of the existing wastewater treatment plant. Stage D improvements will enable the existing treatment plant to process greater quantities of wet-weather flows that enter the collection system, thereby minimizing the amount of untreated collection system overflows to the Willamette and Calapooia Rivers.

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)

RECOMMENDED STAGED TREATMENT IMPROVEMENTS

Project Stage	Improvement Description	Estimated[a] Construction Cost	Estimated[b] Project Cost	Estimated Construction Year
A (INTERIM)	Aeration System			
	Fine Bubble Diffuser Replacement	$ 116		
	Blower Building Modifications			
	New Centrifugal Blowers	330		
	Existing Secondary Clarifier No. 1 Mod.			
	Effluent Weir Baffle	16		
	Miscellaneous	38		
	Stage A Total	$ 500	$ 754	1987
B (INTERIM)	New Influent Pump Station	$1,100		
	New Screening Facility	400		
	New Parshall Flume Flow Measurement	102		
	Existing Secondary Clarifier No. 2 Mod.			
	Effluent Weir Baffle	16		
	Existing Outfall Modification			
	High Level Relief to Cox Cr.	7		
	Miscellaneous	169		
	Stage B Total	$1,794	$2,709	1988
C (INTERIM)	Maintenance Facility	$ 160		
	Existing Secondary Clarifier Modifications			
	Centerwall Modifications	58		
	Provide RAS Chlorination	2		
	Sludge Disposal			
	Develop Contingency Plan[c]	10		
	Digestion			
	New Redundant Boiler	148		
	Central Monitoring			
	Status & Alarms @ Central Lab Location	131		
	Stage C Total	$ 509	$ 768	1990
D (INTERIM)	New Grit Removal Addition	$ 145		
	New Primary Clarifier Addition	642		
	New Flow Control Structures	235		
	Before & After Primary Clarifiers			
	Existing Aeration Basin Modifications			
	Flexible Mode (Step Feed & Complete-Mix)	316		
	Smaller Basin Size	32		
	Chlorination			
	New Chlorine Contact Basin	364		
	Relocate Chlorine Storage	54		
	Outfall Discharge			
	New Outfall to Willamette	190		
	Central Monitoring			
	Status & Alarms @ Central Lab Location	122		
	Miscellaneous	140		
	Stage D Total	$2,240	$ 3,381	1992
E (LONG-RANGE)	Activated Sludge Basins			
	Long-Range Aeration Basin Addition	$1,004		
	Blower Building Modifications			
	New Centrifugal Blower Addition	70		
	Secondary Clarification			
	Long-Range Secondary Clarifier Addition	675		
	Central Monitoring			
	Status & Alarms @ Central Lab Location	109		
	Reevaluate Digester Gas Utilization[c]	10		
	Miscellaneous	352		
	Stage E Total	$2,220	$ 3,351	2004
	TOTAL TREATMENT IMPROVEMENTS (all stages)	$7,263	$10,963	

[a] Estimated order of magnitude construction costs in thousands of dollars at ENR CCI = 4,600.

[b]

DELETE (REPLACED WITH ALBANY WASTEWATER FACILITY PLAN SUMMARY)