CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY

1997

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CITY OF UMATILLA, OREGON

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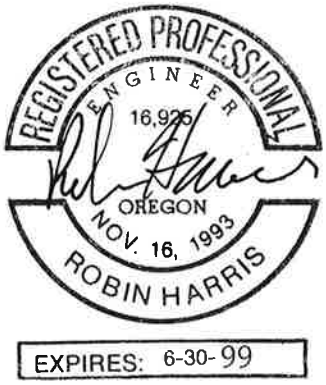

1/14/98

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ACKNOWLEDGMENT

Anderson·Perry & Associates, Inc. gratefully acknowledges Eimco Carrousel® Biological Oxidation System for the graphical representation of the oxidation ditch system which appears on the cover of this document.

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EXECUTIVE SUMMARY

OVERVIEW

The existing wastewater treatment facility (WWTF) that services the City of Umatilla was constructed in 1978. As part of the 1978 improvements, the old WWTF was abandoned and a new biomechanical plant was constructed adjacent to the old plant. The WWTF improvements included installation of a lift station, headworks (hydrosieve), activated sludge aeration basins, activated biofilter, secondary clarifiers, aerobic digesters, and chlorine contact basin. The 1978 WWTF improvements were funded using 100 percent City funds with a local bond issue in the amount of $800,000 passed by the citizens of Umatilla.

Because the low bid on the project came in substantially higher than the funds available to the City for the project, a number of the required treatment units were either not constructed or were not adequately built to provide the required wastewater treatment and solids handling and disposal. The Oregon DEQ recognized and documented deficiencies in the City's solids treatment and sludge disposal systems almost ten years ago and, at that time, recommended completion of WWTF improvements to mitigate the problem. The recommended solids handling and sludge disposal improvements were never done. In 1995, the DEQ approved a study entitled *City of Umatilla, Feasibility Study for Sludge Drying Beds*, prepared by Anderson·Perry & Associates, Inc. The study concluded that the existing sludge treatment system is not reliable in meeting the Class B vector attraction requirements set forth in EPAs Part 503 Sludge Regulations for Land Application. The study also concluded that, as a result of an inadequate mixing and aeration system, the dissolved oxygen (DO) concentration in the digesters is typically in the range of 0.4 to 0.6 mg/L, as compared to the recommended DO concentration range of 1.0 to 2.0 mg/L. Additionally, the City received a Notice of Permit Violation on June 30, 1997, relating to wet weather mass load limits and TSS violations. As a part of the City's response to the violations, the City requested to enter into a Mutual Agreement and Order (MAO) with the DEQ until the necessary planning, funding, design, and construction could be completed to meet regulatory requirements.

In accordance with the City's response to the Department of Environmental Quality, this Wastewater System Study has been prepared. Based upon a 20-year design criteria, the Wastewater System Study provides an evaluation of the City's existing collection, treatment, and outfall system, and provides improvement alternatives to address deficiencies in these areas of the wastewater system. The study also provides funding alternatives and an implementation plan for the selected improvement alternatives.

FINDINGS

Beyond the past permit violation as previously cited, other deficiencies found during the Wastewater Study are as follows:

Collection System.

- The existing McNary Interceptor has limited capacity and surcharges at some manholes, and does not have the capacity to handle flows from the Two Rivers Correctional Institute and the McNary Industrial park anticipated growth.

- The existing Southwest Umatilla Lift Station and Interceptor are at capacity and will not be able to handle the anticipated growth in Southwest Umatilla.

Wastewater Treatment Plant.

- The existing wastewater treatment plant will not be able to properly handle the loading requirements of the Two Rivers Correctional Institute, and future domestic loading requirements.

- The facilities were last upgraded 20 years ago (1977-78). Many of the components are now at the end of their expected life. Those components that are at the end of their life and are in need of replacement or renovation include the following:

  - *Influent Pump Station* . Pumps are nearly worn out, pump and piping capacity is now deficient for anticipated peak flows.

  - *Influent Screens*. Corrosion and support deterioration make these facilities in need of complete replacement.

  - *Biological Treatment Tower*. The media inside the tower needs replacement in order to overcome progressive clogging and deterioration, which includes the media coming apart due to corrosion of fasteners.

  - *Clarifier Mechanisms*. Corrosion and wear requires renovation or replacement.

- Since the construction of the existing facilities regulatory requirements have changed, regulations for discharges to surface waters (Columbia River) and for disposal of sludge (biosolids) have been changed since construction of the treatment facilities:

  - *Receiving Water Quality Based Regulations for Dischargers Require that Toxic Materials in Discharges be Limited*. Chlorine residual in the effluent is no longer allowable and either dechlorination facilities or a change in disinfection method is required.

  - *Receiving Water Dilution*. The outfall from the treatment plant is no longer adequate since it does not extend into the river far enough to

assure consistent dilution year-round. The end of the outfall is exposed at low water.

- *Sludge Treatment*. Regulations for land application of sludge (biosolids) requires additional stabilization, and dewatering, if the solids are to be put to beneficial use.

- *Testing*. Additional testing requirements necessitate more adequate laboratory facilities.

- Existing facilities are not adequate to meet current demands on the plant operator, and additional equipment is needed to reduce on pumps and piping.

  - *Maintenance Facilities*. Maintenance facilities consist of a converted trailer. Current and anticipated workloads demand that more adequate facilities be provided to make the most effective use of operator time.

  - *Laboratory Facilities*. Current lab facilities and equipment are small and inadequate for projected laboratory testing requirements to comply with the NPDES Discharge Permit.

  - *Sludge Handling*. Sludge dewatering is needed to reduce the transportation time and cost for the waste sludge, whether they are transported to land application (soil amendment) or elsewhere for disposal.

  - *Grit Removal Facilities*. There are currently no grit removal facilities in the treatment plant. Grit causes excessive wear on pumps, piping, mechanical equipment and other plant components.

Outfall to the Columbia River.

- With recent fluctuations in the John Day Pool, the existing outfall pipe from the wastewater treatment plant is exposed and does not provide proper mixing of effluent in the River. Additionally, new regulatory standards will require better mixing for dilution of nutrient loading to the River.

ALTERNATIVES

To address the deficiencies in the wastewater system, improvement alternatives were provided for each area. The following briefly outlines the improvement alternatives considered.

Collection System.

- **McNary Interceptor**

  Alternative 1 - Upgrade the existing McNary Interceptor line to provide capacity for domestic flows, the McNary Industrial Park, and the Two Rivers Correctional Institute.

  Alternative 2 - Provide a new interceptor line for the McNary Industrial Park and the Two Rivers Correctional Institute, and a lift station and forcemain for the McNary Industrial Park. The old McNary Interceptor would be for domestic service only.

  Alternative 3 - No action.

- **Southwest Umatilla Collection System**

  Alternative 1 - Perform the sewage lift station improvements and stage interceptor improvements as growth occurs.

  Alternative 2 - Include the sewage lift station and interceptor improvements with the overall project.

  Alternative 3 - No action.

Wastewater Treatment System.

- *Alternative 1* - Upgrade the existing treatment plant.
- *Alternative 2* - Provide a new oxidation ditch treatment plant.
- *Alternative 3* - Provide a new sequencing batch reactor treatment plant.
- *Alternative 4* - Provide either Alternative 1, 2, or 3 treatment and effluent storage and reuse with no discharge to the Columbia River.
- *Alternative 5* - No action.

Wastewater Outfall System.

- *Alternative 1* - Extend the outfall further into the Columbia River to provide proper mixing .

- *Alternative 2* - No discharge to the Columbia River by providing a new effluent storage and reuse system.

- *Alternative 3* - No action.

Based on review and comments from City staff, the City of Umatilla Public Works Committee, Port of Umatilla, Department of Corrections, McNary Industrial Park users, and the citizenry of Umatilla, the City Council approved the following selected alternatives:

Collection System

- **McNary Interceptor**

  Alternative 2 - Provide a new interceptor line and McNary Lift Station and Forcemain Improvements.

- **Southwest Umatilla Collection System**

  Alternative 2 - Include the sewage lift station improvements and interceptor improvements with the overall project.

Wastewater Treatment System

- *Alternative 2* - Provide a new oxidation ditch treatment plant.

Wastewater Outfall System

- *Alternative 1* - Extend the outfall further into the Columbia River to provide proper mixing.

Table E-1 shows the cost of these improvements and the share of those costs between the City of Umatilla, the Department of Corrections, and the McNary Industrial Park. Figure E-1 shows the location of the selected improvements.

OUTFALL TO RIVER IMPROVEMENTS

15" SOUTHWEST INTERCEPTOR IMPROVEMENTS

12" SOUTHWEST INTERCEPTOR IMPROVEMENTS

OXIDATION DITCH WASTEWATER TREATMENT FACILITY IMPROVEMENTS

24" McNARY INTERCEPTOR IMPROVEMENTS

18" McNARY INTERCEPTOR IMPROVEMENTS

15" McNARY INTERCEPTOR IMPROVEMENTS

N

SCALE: 1"=2000'

TWO RIVERS CORRECTIONAL INSTITUTE

JOHNS MANSVILLE

McNARY INDUSTRIAL PARK 8" FORCEMAIN IMPROVEMENTS

GILROY FOODS

EXISTING 12" McNARY INTERCEPTOR

8" FORCEMAIN IMPROVEMENTS

SOUTHWEST LIFT STATION IMPROVEMENTS

McNARY INDUSTRIAL PARK LIFT STATION IMPROVEMENTS

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CITY OF
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WASTEWATER SYSTEM STUDY
SELECTED IMPROVEMENTS

FIGURE
E-1

CHAPTER 1

INTRODUCTION

The City of Umatilla operates a conventional gravity wastewater collection system and an activated biofilter/activated sludge secondary wastewater treatment facility. The City of Umatilla's wastewater system serves a population of 3,310 residents, commercial establishments, and several small industrial facilities. Currently, the City's wastewater system is unable to fully comply with state and federal regulations regarding the treatment and disposal of wastewater-derived biosolids generated at the treatment facility. New effluent limitations on chlorine anticipated for the City's wastewater treatment plant discharge to the Columbia River constitute a second compliance issue facing the City. In addition to addressing compliance issues, the City of Umatilla must prepare for expanding residential, commercial, and industrial sectors within the City and the Two Rivers Correctional Institute (TRCI), which is currently under construction in east Umatilla. Overall community growth will place new demands on the City's wastewater system. This Wastewater System Study has been prepared to address each of these distinctly individual issues.

The City of Umatilla is located in the extreme northwest corner of Umatilla County in eastern Oregon, as shown in Figure 1-1. The City fronts the Columbia River from the mouth of the Umatilla River upstream to the McNary Dam/Lake Wallula area. Neighboring communities in the vicinity of Umatilla include Hermiston to the south; Irrigon and Boardman to the west; and the Tri-Cities, Washington, to the north.

AUTHORIZATION

This Wastewater System Study is funded, in part, by a loan through the Oregon Department of Environmental Quality's (DEQ's) Clean Water State Revolving Fund. Loan No. R93050 was awarded to the City of Umatilla effective April 2, 1997. Through an engineering agreement dated June 17, 1997, the City of Umatilla authorized Anderson·Perry & Associates, Inc., to conduct a wastewater system evaluation and prepare this wastewater system planning document.

PURPOSE

The purpose of this Wastewater System Study is to identify wastewater collection, treatment, and disposal system improvements necessary to reliably serve the City of Umatilla through the year 2020. A recommended improvements package must be acceptable and affordable to City residents and rate payers and must address the principal compliance and capacity issues described below.

Biosolids Treatment Requirements. In February 1992, the U.S. Environmental Protection Agency (EPA) published new regulations for the treatment and use, or disposal, of sanitary wastewater-derived sludges, or biosolids. These new regulations, included in Title 40, Part 503, of the Code of Federal Regulations (CFR), required all municipal wastewater treatment facilities to meet new wastewater solids treatment requirements by February 1995. As part of these new regulations, 40 CFR 503 places new limits on the concentration of pathogens or indicator organisms in wastewater-derived sludges and establishes minimum treatment and disposal requirements to reduce the vector (e.g., flies, mosquitoes, birds, etc.) attraction characteristics of finished biosolids. Pathogen reduction and vector attraction performance requirements vary with the biosolids utilization or disposal method. The City of Umatilla land-applies biosolids on agricultural land, which requires the City to provide solids treatment to meet at least "Class B" pathogen reduction criteria listed in the CFR. Land application programs are also required to meet one of 10 alternatives to reduce vector attraction characteristics. Since 40 CFR 503 went into effect, the State of Oregon adopted similar biosolids requirements in Oregon Administrative Rules (OAR) Chapter 340, Division 50.

In July 1995, the City of Umatilla completed a Feasibility Study for Sludge Drying Beds at the wastewater treatment facility. The feasibility study concluded that existing sludge processing equipment was capable of meeting applicable vector attraction criteria only 65 percent of the time and that compliance with Class B pathogen reduction criteria was possible but not assured. The report indicated that new sludge drying beds could be used to provide full compliance with 40 CFR 503. However, the City was unable to negotiate a land purchase agreement with the Corps of Engineers to acquire land necessary to site the sludge drying beds. The City decided to suspend plans for a sludge drying bed project until land acquisition issues could be resolved and other biosolids alternatives could be evaluated.

On July 2, 1997, the City of Umatilla received a Notice of Permit Violation (NPV) from the DEQ. The NPV specifically addressed two violations involving the City's discharge to the Columbia River, both of which have been resolved. However, the cover letter attached to the NPV also noted that the City has been in violation of OAR 340-50 and 40 CFR 503 because of the treatment plant's inability to meet vector attraction reduction standards. In subsequent discussions, DEQ indicated that the City could enter into a Mutual Agreement and Order to formally recognize the planning, funding, design, and construction phases that will be necessary to meet both state and federal biosolids requirements. DEQ is currently drafting a Mutual Agreement and Order, which will require the City to address biosolids requirements as part of an overall wastewater system improvements project. Appendix A contains permit violation correspondence.

Discharge Limitations. Consistent with the DEQ's policies for controlling discharges of toxic substances to waters of the state, DEQ has indicated that the City will be required to significantly reduce and control the quantity of chlorine discharged into the Columbia River via the City's outfall. The City's existing National Pollutant Discharge Elimination System (NPDES) permit, as included in Appendix B, does not contain limitations on chlorine. However, DEQ has indicated that a future permit will establish

numeric limits on chlorine. The City of Umatilla will be required to modify their wastewater disinfection system to control chlorine discharges. Therefore, this plan must identify an appropriate method for removing chlorine prior to discharge or for replacing chlorine with an alternate disinfection process.

Residential and Commercial Growth. New economic opportunities in the City of Umatilla and in the greater Mid-Columbia region are spurring residential and commercial development in the City and surrounding communities. The Oregon Employment Department predicts the Umatilla/Morrow County region will enjoy the fastest growing job market in the state through the next several years. A strategy for providing wastewater system capacity to meet the demands of residential and commercial growth is necessary.

Industrial Growth. The Port of Umatilla has indicated that moderate industrial expansion is possible at the McNary Industrial Park, which is already home to the ConAgra onion processing facility (formerly Gilroy Foods) and several other industries. The impact of industrial growth on the City's wastewater facilities needs to be evaluated to determine if continued service to the McNary Industrial Park using the City's existing residential/commercial excess capacity will be feasible.

Two Rivers Correctional Institute. In 1996, the Oregon Department of Corrections (DOC) selected the City of Umatilla to host a new 1,600-bed, medium-security correctional institution. The Two Rivers Correctional Institute (TRCI), which is scheduled to open in January 2000, is expected to place a major new demand on the City's wastewater system. A strategy for serving TRCI is needed, and the schedule for prison construction is requiring the City to accelerate overall efforts to plan wastewater system improvements.

SCOPE

The engineering agreement between the City of Umatilla and Anderson·Perry & Associates, Inc., identifies planning tasks necessary to satisfy the goals of this Wastewater System Study. These tasks are collectively summarized into the principal work items below.

1. Development of overall wastewater system design flows and loads, including individual contributions from TRCI and residential, commercial, and industrial sectors.

2. Evaluation of the existing wastewater collection system capacity with special emphasis placed on the capacity of the interceptor sewer from the McNary Industrial Park/TRCI area.

3. Identification of collection system improvements necessary to serve new and existing developments in the service area.

4. Evaluation of the existing wastewater treatment facility and prospects for its expansion to meet projected design flows.

5. Identification of new wastewater treatment requirements for new or modified wastewater treatment facilities that will allow the City of Umatilla to receive a mass load increase for their discharge into the Columbia River.

6. Identification of possible treatment plant improvement alternatives to serve the projected study area population while meeting anticipated treatment requirements.

7. Identification of a preferred wastewater system improvements package, including necessary collection system and treatment system improvements.

8. Development of a wastewater system financial plan to guide the City of Umatilla in acquiring funds necessary for design, construction, operation, and maintenance of the preferred improvements package.

STUDY OUTLINE

Chapters 2 through 7 of this study present information and recommendations developed through the completion of the study tasks defined above. Chapter 2 is dedicated to describing environmental and demographic conditions within the City of Umatilla. This chapter also describes existing wastewater collection, treatment, and disposal systems and summarizes historic flows and loads received at the wastewater treatment plant. Chapter 3 is dedicated to the development of overall wastewater system design criteria. Study area characteristics, land use patterns, and estimates for community growth are used to develop overall wastewater system design flows and loads. These flows and loads are matched with anticipated NPDES permit requirements to establish specific minimum system design criteria. Chapter 4 provides an evaluation of existing collection, treatment, and disposal facilities and summarizes deficiencies in light of design criteria established in Chapter 3, and operational concerns.

Chapter 5 of this study identifies alternatives for improving or expanding the City's collection, treatment, and disposal facilities. Preliminary cost estimates are included for all improvement alternatives. Chapter 6 is devoted to the development of a recommended wastewater system improvements package. The final improvements package is developed based on anticipated community growth, ability to satisfy design criteria, overall cost, and City preferences. Finally, Chapter 7 develops a strategy for funding recommended improvement alternatives and outlines an implementation schedule.

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CITY OF
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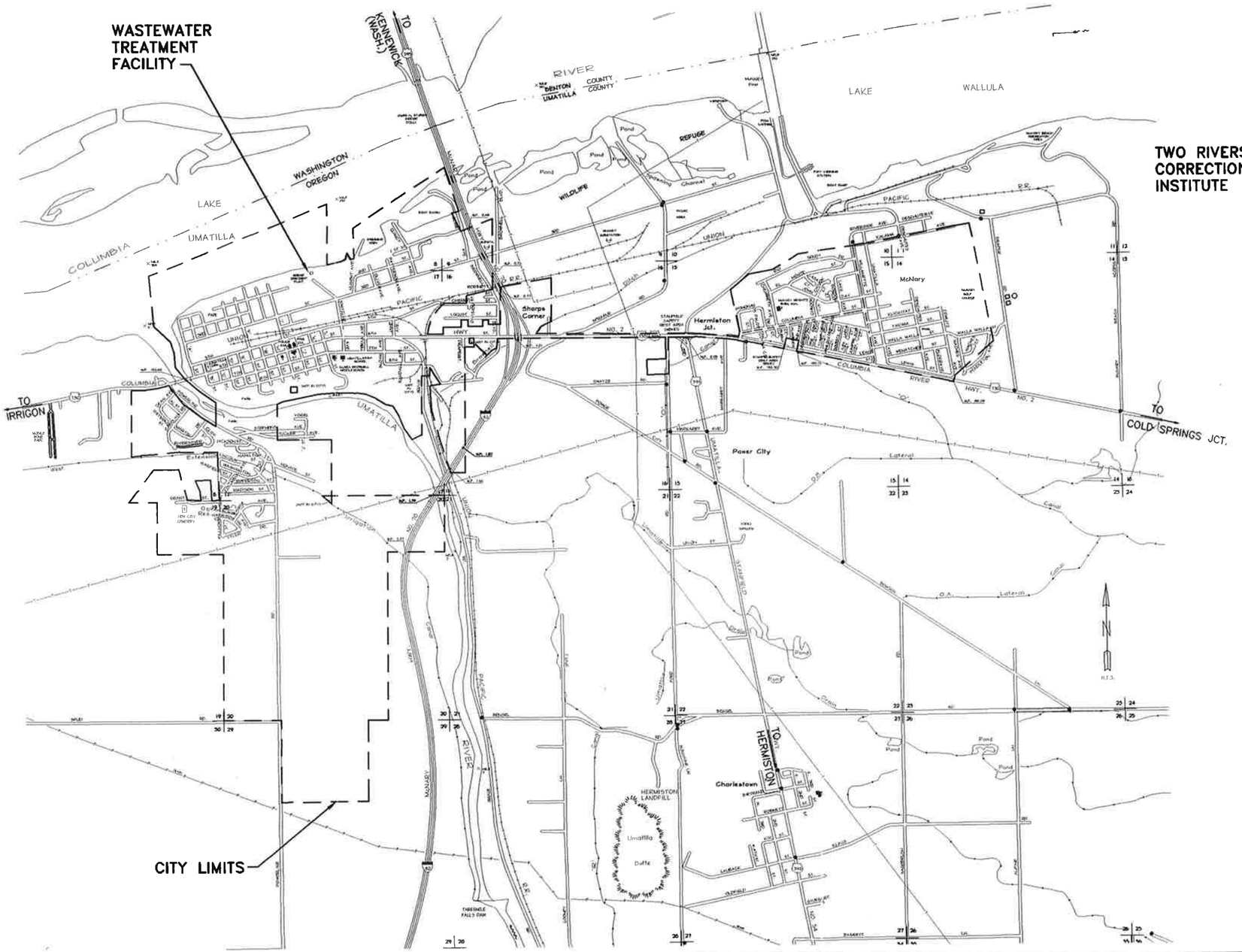
WASTEWATER SYSTEM STUDY

LOCATION MAP

FIGURE
1-1



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CITY OF
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WASTEWATER SYSTEM STUDY
VICINITY MAP

FIGURE
1-2

PATH: J:\UMATCITY\WASTE\STUDY\FIG-2.DWG

CHAPTER 2

EXISTING SETTING

In this chapter, environmental, demographic, and economic conditions in and around the City of Umatilla are described to provide background information pertinent to decisions in this report. Existing wastewater collection, treatment, and disposal facilities are also described as an introduction to subsequent chapters detailing wastewater system design criteria and capacity and operational deficiencies within the existing wastewater system. A study area map is shown in Figure 2-1 to complement discussions in this chapter. The study area includes all lands within the City of Umatilla's Urban Growth Boundary.

STUDY AREA

The study area for this Wastewater System Study encompasses the entire area within the City of Umatilla's Urban Growth Boundary (refer to Figure 2-1). Within the study area and the City limits, four distinct subareas exist. For purposes of discussion, these four subareas are subsequently referred to in this study as southwest Umatilla, downtown and east Umatilla, old McNary Township (McNary area), and the McNary Industrial Park. Southwest Umatilla is considered that area west of the Umatilla River and Interstate 82. Downtown and east Umatilla generally consist of the area east of the Umatilla River and west of Interstate 82. The McNary area consists of the property east of Interstate 82, west of Draper Road and south and north of Highway 730. The McNary Industrial Park is that area that lies east of Draper Road and north of Highway 730.

ENVIRONMENTAL CONDITIONS

Topography. The City of Umatilla's downtown area, bordered by the Umatilla River to the south and the Columbia River to the north, lies at 300 feet above mean sea level. In the east portion of the study area, including the McNary town site, McNary Industrial Park, and TRCI, elevations range between 475 and 500 feet above mean sea level. The City's wastewater treatment facility is at elevation 280 feet and the surface of the Columbia River is at 265 feet at normal operating pool level. Low-level plateaus to the south and east of the Urban Growth Boundary rise to 550 feet.

Geology. The City of Umatilla lies within the Columbia Basalt Plain, or Columbia Basin, physiogeographic province. Massive basalt formations ranging to over 5,000 feet in total thickness are characteristic of the area. In the City of Umatilla region, basalt bedrock is overlain by varying layers of sedimentary deposits including silts, sands, gravels, and volcanic ash.

The *Soil Survey of Umatilla County Area, Oregon*, published through the USDA Natural Resources Conservation Service, indicates that most soils in the study area are comprised of windblown fine sand, loamy sand, sandy loam, and alluvial gravels. In the

downtown area and central study area, soils include the Adkins Series of fine sandy loam and the Quincy Series of loamy fine sands. The Adkins soils are typically deep, well-drained, eolian deposits of sand and fine sandy loam with some areas underlain by a gravelly substratum. The Quincy soil series are also eolian sand and loam deposits, but tend to be excessively drained. Depth to basalt in these areas is reportedly 60 inches or more, which agrees with observations by City of Umatilla Public Works staff.

The western portion of the study area, including land surrounding Highway 730, is principally comprised of Quincy loamy fine sands with a gravelly substratum. The eastern portion of the study area, including the TRCI site, is uniquely distinguished by the presence of Starbuck Series very fine sandy loam and rock outcrop complexes. The Starbuck Series are formed in loess and eolian sand deposits with a bedrock interface anywhere from 0 to 60 inches below ground surface. Rock outcroppings are visible throughout portions of the eastern study area and shallow basalt has influenced design decisions for utilities installation at TRCI.

Because most soils in the study area are deep and well drained to excessively drained, it is anticipated that most sanitary sewer mains lie in unsaturated soils. This condition limits the potential for groundwater infiltration into the sanitary sewer system, which has created capacity problems in many other communities. Non-cohesive fine sands and silts common to the study area can be eroded by wind when exposed. During construction of wastewater system improvements, wind erosion will need to be controlled by limiting clearing and grubbing activities to only those essential to the project and by applying water to exposed areas to control fugitive emissions.

Climate. The City of Umatilla's arid climate is typical of many other eastern Oregon communities. However, weather patterns can be moderated by the Columbia River. The Oregon Climate Service does not maintain a weather station in the City, but there is a station in Hermiston, Oregon. The Umatilla-Hermiston region receives approximately 9 inches of total precipitation each year. In a typical year, approximately 4 inches of precipitation falls between May and November, with the remainder in the winter months of December through April. The mean temperature is 52°F with historic minimum and maximum temperatures of -17°F and 113°F.

Surface Water. Two perennial streams are present in the study area, including the Umatilla River, which serves to border the present downtown area, and the Columbia River, which defines the northern boundary of the study area. The presence of these two rivers has strongly influenced the historic development pattern in the City of Umatilla. Opportunities for navigation, recreation, transportation, hydroelectric power generation, and crop irrigation have played a major role in shaping the City of Umatilla's land use and employment bases.

The Umatilla River originates in the Umatilla National Forest approximately 70 miles southeast of the City of Umatilla. The river flows northwesterly through the Umatilla Indian Reservation, Pendleton, Echo, Stanfield, and Hermiston before reaching the City of Umatilla. Between Pendleton and Hermiston, the Umatilla River is heavily relied upon to

provide irrigation water for a variety of crops including potatoes, corn, wheat, melons, and alfalfa. Irrigation facilities such as dams, canals, pump stations, and reservoirs have been developed at various points along the river to satisfy irrigation needs. During summer months, flow in the Umatilla River between the City of Umatilla and Echo is severely reduced due to irrigation withdrawals. The Umatilla Basin Project (a cooperative effort between state and federal agencies, area irrigators, and the Confederated Tribes of the Umatilla Indian Reservation) has recently produced higher in-stream flows during critical fish migration periods in the river.

The City of Umatilla does not directly utilize the Umatilla River, such as for a water supply or for treated wastewater disposal. However, the Umatilla River does provide several indirect benefits to the City. Riparian areas along the river provide open spaces and greenways through southern and western portions of the City of Umatilla. These features enhance the City's environmental setting and overall livability characteristics. The Umatilla River also provides for a variety of recreational opportunities including fishing, water contact activities, and wildlife viewing.

The Columbia River, due to its sheer size and relatively good water quality, is the most important and most utilized surface water body in the Pacific Northwest. Human uses of the river include power production, transportation, irrigation, navigation, flood control, recreation, domestic water consumption, industrial water consumption, and sport fishing. The river supports a wide variety of fish, mammals, and other wildlife and serves to drain much of the inland northwest to the Pacific Ocean.

The City of Umatilla lies adjacent to Lake Umatilla, which is formed by the John Day Lock and Dam 76 miles downstream. Unlike other dams on the middle Columbia River, the John Day Dam is operated for flood control. The water level in Lake Umatilla can be manipulated to provide approximately one-half million acre-feet of flood water storage. The City of Umatilla's existing wastewater treatment facility discharges to Lake Umatilla at Columbia River Mile 289.

McNary Lock and Dam lies approximately 1.5 miles upstream of the City's outfall. McNary Dam forms Lake Wallula, which stretches 64 miles upstream. McNary Dam is used for navigation, power generation, irrigation, and fish passage. McNary Dam is operated as a "run of the river" dam with no flood control capabilities. According to documents published by the Walla Walla District Corps of Engineers, flows in the Columbia River at the City of Umatilla reflect a typical snowmelt regime with lower flows occurring during the fall and winter and high flows occurring in spring and early summer months. For the period of 1960 through 1989, the minimum and maximum average monthly river flows were 82,668 cfs (December) and 572,333 cfs (June). Flows from the Yakima, Snake, and Walla Walla Rivers enter the Columbia River along Lake Wallula.

Uses of the Columbia River in the City of Umatilla area are regulated or influenced by a number of agencies including the following:

- Oregon Department of Environmental Quality
- Washington Department of Ecology
- US Army Corps of Engineers
- National Marine Fisheries Service
- State and Federal wildlife agencies
- The Environmental Protection Agency
- Bonneville Power Administration
- Northwest Power Planning Council
- U.S. Coast Guard

The City of Umatilla's wastewater treatment plant discharge into the Columbia River is specifically regulated through an NPDES permit issued by the Department of Environmental Quality. The permit is based on water quality standards and minimum design criteria contained in Oregon Administrative Rules (OAR).

OAR 340-41-645 establishes minimum water quality standards for the entire Umatilla Basin including the main stem of the Columbia, while OAR 340-41-655 establishes minimum design criteria for the treatment and control of wastes discharged into water bodies of the Umatilla Basin. Specific water quality standards and minimum design criteria applicable to the City of Umatilla's wastewater improvements project are discussed in Chapter 3.

Groundwater. Groundwater is present below the study area in both basalt and unconsolidated surface formations. Multiple water bearing zones in subsurface basalt include minor aquifers fed by surface precipitation and recharge from the Umatilla River; and a major aquifer system supplied by precipitation and runoff on a regional scale, including snowmelt runoff from the Blue Mountains.

Unconfined groundwater can be found throughout the study area on a permanent or temporary basis, depending on location. Precipitation percolating through unconsolidated sands and silts can collect over the top of shallow basalt to form a perched water layer, as can be found in the east study area. Unconfined groundwater is also present close to the ground surface in the vicinity of the Umatilla River or in areas influenced by crop irrigation. Depths to the unconfined water table typically vary from 0-30 feet depending on location and time of year.

Groundwater quality is a significant concern in both Umatilla and Morrow Counties. DEQ has designated northern portions of these counties into the Lower Umatilla Basin Groundwater Management Area. The primary pollutant addressed by the management area is nitrate nitrogen, which can affect the health of infants and young children ("blue-baby syndrome"). Nitrate nitrogen management efforts are particularly aimed at the region's agricultural practices, but would also impact the City of Umatilla if the City were to propose crop irrigation or a direct discharge to groundwater for treated wastewater disposal. Later in this report, irrigation is considered as one alternative for disposing of or using treated effluent. However, because area soils are rapidly draining, the irrigation option could result in additional degradation of area groundwater. Therefore, continued

use of the Columbia River outfall appears to be advantageous from at least one environmental perspective.

Wetlands. The operation of the Columbia River as a series of reservoirs, including Lake Umatilla and Lake Wallula, has altered the natural extent and distribution of wetlands along the river's length. Local plant communities have established under normal pool fluctuations of 3 to 5 feet. New wetland, riparian, and shallow water habitats have formed along the Columbia River, especially along Lake Wallula from McNary Dam upstream to the confluence of the Snake River. In general, wetland vegetation in the region consists of rushes, sedges, and cattails in an emergent environment.

Wetlands have been identified along the Columbia River in the 500-acre McNary Wildlife Nature Area located immediately below McNary Dam. Further downstream, the Umatilla National Wildlife Refuge near Irrigon and the Irrigon Wildlife Area, between the Cities of Umatilla and Irrigon, also host large areas exhibiting wetland features. Away from the Columbia River, small potholes perched over basalt provide wetland-like habitat in the eastern study area along both sides of U.S. Highway 730. No natural or manmade wetlands are thought to exist in the vicinity of the City of Umatilla's existing wastewater treatment facility.

Flood Hazards. In 1984, a flood insurance rate map for the City of Umatilla was updated through the Federal Emergency Management Agency's National Flood Insurance Program. The rate map, as shown in Figure 2-2, delineates areas prone to flooding during extreme flood events (e.g., 100-year and 500-year floods).

Floodplains in the City of Umatilla encompass only a narrow band along the Umatilla River and the Columbia River shoreline. The downtown area, McNary town site, McNary Industrial Park, and TRCI site are categorized as "minimal flooding" areas.

The City's existing wastewater treatment site lies outside of the 100-year floodplain except perhaps for a small, unutilized area in the northwest corner of the site. Existing treatment facility components were apparently constructed to recognize the 100-year flood boundary. All structures near the river are elevated to protect against flooding.

Fish and Wildlife. The Columbia River supports numerous runs of anadromous fish including spring, summer, and fall chinook; sockeye salmon; coho salmon; steelhead trout; white sturgeon; American shad; and lamprey. Other noteworthy game and non-game fish species in the Columbia include bass, crappie, blue gill, walleye, perch, suckers, northern squawfish, and shiners. Riparian areas bordering the Columbia River and Umatilla River provide valuable habitat for a variety of waterfowl, raptors, and upland game birds. Ducks, geese, quail, mourning doves, and ringneck pheasants can be found throughout the study area. The Umatilla National Wildlife Refuge provides important nesting sites for the Swanson's hawk, red-tailed hawk, great horned owl, and northern pigmy owl. Peregrine falcons and bald eagles have also been sited in the McNary Dam area.

Mammals common to upland and riparian areas include the black-tailed jackrabbit, mule deer, Washington ground squirrel, coyote, and deer mouse. Skunks, muskrats, racoons, and cotton-tail rabbits are also found, principally along riparian corridors.

Threatened and Endangered Species. In September 1990, the U.S. Army Corps of Engineers issued a final supplement to the environmental impact statement (EIS) associated with the construction of juvenile fish loading and holding facilities at McNary Lock and Dam. This document identified two federally-listed threatened or endangered species in the Umatilla area as of 1990. The peregrine falcon, a federally listed endangered species, is thought to utilize the Columbia River/McNary Dam area during spring and fall migrations through the region. Historically, one to four peregrine falcons have been observed for 2 to 3 weeks during each migration period. However, at the time of the EIS report, there were no records of active or historical nest sites. The area does not host tall cliffs preferred by peregrine falcons for nesting.

The Corps' EIS identified the bald eagle as the only federally listed threatened species in the study area. Bald eagles can be found wintering in the area below McNary Dam. However, the north and south shores of the Columbia River in the vicinity of the City of Umatilla lack cliffs and trees suitable for bald eagle nesting. According to the EIS, there were no active or historical bald eagle nest sites noted in north-central Oregon.

Since 1990, several species of salmon and steelhead that migrate through the Columbia River past McNary Dam have been listed as threatened, such as the Snake River chinook salmon, or have been proposed for federal listing. The primary reasons for declines in migratory fish numbers are typically thought to be associated with poor habitat in spawning areas, the operation of dams along the Columbia and Snake Rivers, and overfishing or poor ocean conditions. In an effort to stop the decline in salmon and steelhead populations, the Corps of Engineers, National Marine Fisheries Service, Northwest Power Planning Council, and other agencies are evaluating, among other things, dam operations along the Columbia River. Dams have altered the flow of the Columbia River from a free-flowing state to a series of reservoirs and dams provide a partial barrier to fish passage. The City of Umatilla's outfall into the Columbia River is not thought to be contributing to the decline in salmon populations.

The Oregon Department of Fish and Wildlife maintains a database of state-listed threatened and endangered fish and wildlife species. Oregon's list of threatened species for the City of Umatilla area includes the Snake River chinook salmon (spring/summer/fall) and the bald eagle. The endangered species list includes only the peregrine falcon. Both lists are similar to those developed under the Federal Endangered Species Act.

Air Quality. Generally, air quality in the Umatilla area is excellent. There are no air quality non-attainment areas overlapping the study area and there are no large heavy industries that significantly affect air quality. A garlic dehydration facility formerly located in the Port of Umatilla McNary Industrial Park was a source of several air quality complaints in the early 1990's. This facility has since been converted to a seasonally operated onion processing facility and complaints are no longer received by the DEQ. No

chronic odor complaints have been associated with the existing wastewater treatment facility. Blowing sand from denuded or exposed areas is a minor air quality irritant.

Water Supply. The City of Umatilla's water system is served by three deep basalt wells with a total capacity of approximately 3,500 gpm. Five storage reservoirs with nearly 5 million gallons of storage capacity and a well-looped distribution system serve City customers in three separate pressure zones. With over $3 million in recent improvements, the City has a great degree of flexibility and reliability in the water system. Currently, the City's water system has some reserve capacity to satisfy a moderate level of population growth or industrial demands. Additional capacity may need to be created in the intermediate future depending on population growth.

DEMOGRAPHIC AND ECONOMIC CONDITIONS

Population. According to the Center for Population Research and Census at Portland State University, the City of Umatilla is home to 3,310 residents (July 1996 official estimate). The estimated 1996 population represents an 8.7 percent increase over the official 1990 Census population of 3,046 residents. Residential centers include the area surrounding downtown Umatilla and the old McNary town site just above McNary Dam.

Transportation. Interstate 82 and U.S. Highway 395 join at the City of Umatilla before crossing the Columbia River into Washington. These major highways are intersected by U.S. Highway 730, which parallels the Columbia River. A Union Pacific rail line provides rail access to the City's industrial area, and the Columbia River is a major transportation route for barge traffic. With a combination of highway, rail, and river transportation methods, the City of Umatilla is easily accessed from both north-south and east-west corridors.

Employment. The economies in Umatilla and Morrow Counties, as well as in Benton County across the river in Washington, are largely driven by the region's agricultural sector. Irrigated and dryland farming operations provide employment to many City of Umatilla residents. Food processing industries located throughout Umatilla and Morrow Counties, including the McNary Industrial Park, have diversified the area's agricultural employment opportunities. A small industrial base at the McNary Industrial Park; retail, service, and government establishments and offices in the downtown area; and McNary Dam comprise the remaining major employment areas. While agricultural is expected to remain as a major employment base in and around the City of Umatilla, the construction of TRCI and secondary manufacturing growth at the Port of Umatilla is expected to diversify the City's economy.

Besides TRCI, three other major projects are under construction in west Umatilla County. These include the Umatilla Army Depot Chemical Weapons Incinerator, an expansion of the Union Pacific Railroad Yard at Hinkle, and a Wal-Mart Distribution Center at Hermiston. The four projects are projected to add 2,200 new, permanent jobs to the communities of Umatilla, Hermiston, Echo, and Stanfield. TRCI is expected to staff 550 new employees on a permanent basis.

Historical and Archeological Sites. The National Register of Historic Places, National Register Information System, contains no listing of historic structures for the City of Umatilla. In addition, no archeological sites are known to exist in the vicinity of the City of Umatilla's wastewater treatment plant site.

EXISTING WASTEWATER COLLECTION SYSTEM

The City of Umatilla's wastewater collection system consists of two main interceptors, one that collects wastewater from the southwest Umatilla area (Southwest) and the downtown, and one that collects wastewater from the old McNary town site and more recent developments in east Umatilla and the McNary Industrial Park. Refer to Figure 2-3 for a plan of the City's existing wastewater collection system. The existing Southwest and downtown collection system (subsequently referred to as the Southwest System) and the McNary collection system, including the pumping systems, are discussed in detail in this section of the Wastewater System Study.

Southwest Collection System. The Southwest System consists of a single interceptor with 8-inch and 10-inch pipes, 8-inch trunk lines, and 6-inch and 8-inch laterals that transport wastewater from the housing and commercial developments of the southwest Umatilla and downtown areas to the wastewater treatment facility. The system has one sewage lift station that pumps wastewater collected from the Southwest area developments across the Umatilla River.

According to the City's wastewater collection system base map, the Southwest interceptor line consists of approximately 5,850 feet of 8-inch pipe and 3,600 feet of 10-inch pipe. Refer to Figure 2-4 for a plan of the existing Southwest collection system. The trunks and laterals consist of about 4,000 feet of 6-inch pipe and 24,000 feet of 8-inch pipe, or a total length, including the interceptor, trunks and laterals, of about 37,450 feet (slightly over 7 miles of collection piping). City staff report that the majority of the piping in the Southwest collection system is constructed from asbestos cement (AC) with a minor amount, mostly in the newer developments in the Southwest area, constructed from polyvinyl chloride (PVC). The Southwest collection system has about 109 manholes with the majority constructed from precast concrete barrels with circular steel rings and lids and, based upon visual manhole inspections, currently appear to be in adequate condition (not all manholes in the Southwest system were inspected).

The Southwest sewage lift station is located at the intersection of Power Line and Carolina Roads. The lift station is a Cornell Pump Co. Com-Pak package system consisting of a wet well and a dry well. The lift station was reported to have been installed circa 1969, according to Cornell Pump Co. records, and consists of two 7.5 HP centrifugal pumps with a 4-inch force main. A preliminary hydraulic capacity analysis of the lift station indicates that it is operating at approximately 45 feet of total dynamic head (TDH) and 180 gpm, assuming a single pump is operating. The hydraulic capacity if both pumps are operating in parallel is 195 gpm at 50 feet of TDH. However, according to Oregon Administrative Rules 340-52 Appendix B, raw sewage lift stations must provide the necessary redundancy by providing lift units capable of passing the peak hourly flow rate

(PHF) with the largest unit out of service. Therefore, the existing lift station must be capable of pumping the projected PHF with only one pump operating. With this constraint, the hydraulic capacity of the existing lift station is about 180 gpm (259,000 gallons per day).

McNary Collection System. The McNary Collection System consists of one 12-inch interceptor, 8 and 12-inch trunk lines and 6 and 8-inch laterals. The McNary collection system serves residential and commercial developments within the McNary townsite, a small development in the Wildwood Lane area south of Highway 730 and east of Highway 395, a small area in west central Umatilla in the vicinity of Switzler Avenue and sixth street, and the Port of Umatilla and the McNary Industrial Park. The McNary system has two sewage lift stations. Refer to Figure 2-5 for a plan of the existing McNary collection system.

Based upon the City's wastewater collection system base map, the McNary interceptor line consists of approximately 24,000 feet of 12-inch pipe. The trunks and laterals consist of about 1,000 feet of 6-inch pipe, 23,400 feet of 8-inch pipe, and 9,700 feet of 12-inch pipe or a total length, including the interceptor, trunks and laterals, of about 58,100 feet (11 miles of collection piping). City staff report that the majority of the piping in the McNary collection system is constructed from AC with a minor amount, mostly in the newer developments in the McNary area, constructed from PVC. The McNary collection system has about 152 manholes with the majority constructed from precast cylindrical concrete barrels with circular steel rings and lids. Some of the manholes, however, are constructed of square reinforced concrete barrels with square lids fabricated from steel diamond plate. Based upon visual manhole inspections, the manholes in the McNary system currently appear to be in adequate condition (not all manholes in the system were inspected).

As mentioned previously, the McNary system has two sewage lift stations. The two sewage lift stations are referred to as the McNary Lift Station and the Wildwood Lane Sewage Lift Station.

In 1996, the City of Umatilla improved the old existing McNary Sewage Lift Station located in the vicinity of Naches Avenue and Highway 730. The improvements generally included replacing the duplex sewage pumps, piping and valving, and electrical and control system with new equipment. The new McNary Sewage Lift Station consists of a packaged duplex submersible pumping system installed in the old existing 5-feet diameter, 15-feet deep wet well. The lift station consists of two 3-inch discharge 2.4 HP submersible sewage pumps complete with a rail system for easy pump removal, mercury float switches for on/off control, and a 230 VAC single phase 60 Hz control circuit. The pumps are ITT, Flygt Model CP3085-436, and each have a capacity of 170 gpm at 20 feet TDH when operated at a maximum speed of 1,700 rpm. The pumps discharge into a 4-inch PVC forcemain that discharges wastewater into a manhole on the intersection of Cowlitz Avenue and Lewis Street. The lift station serves a small area in Southeast McNary that lies north of Highway 730, east of Cowlitz Avenue, south of the golf course, and west of Draper Road.

The Wildwood Lane Sewage Lift Station currently serves a small development in the McNary area that lies generally east of Highway 395 and south of Highway 730 adjacent to Wildwood Lane. The Wildwood Lane Sewage Lift Station was installed in 1994 and consists of a packaged duplex submersible system. The lift station consists of two 4-inch discharge 4 HP submersible sewage pumps complete with a rail system for easy pump removal, mercury float switches for on/off control, and a 230 VAC single phase 60 Hz control circuit. The pumps are ITT, Flygt Model CP3102-436, and each have a capacity of 400 gpm at 26 feet TDH when operated at a maximum speed of 1,700 rpm. The pumps discharge into a 4-inch PVC forcemain that discharges wastewater into a manhole on the intersection of Pomona and Highway 730.

EXISTING WASTEWATER TREATMENT SYSTEM

In 1978-79, the City of Umatilla constructed a new activated biofilter/activated sludge wastewater treatment facility to replace an aging, undersized, contact stabilization-type activated sludge facility. The new treatment plant was constructed adjacent to the contact stabilization plant at the City's sewage treatment plant site between 3rd Street and the Columbia River. Major improvements constructed during the 1978-79 project include a raw sewage pump station, a hydrosieve (side hill) screening facility, a redwood media activated biofilter (ABF) tower complete with a tower recycle pumping system, two aeration basins, two rectangular clarifiers, two aerobic digesters, a chlorination system and chlorine contact basins, and a new operations center. In addition, the control building originally associated with the contact stabilization plant was converted to house laboratory equipment, aeration blowers, and chlorine injection equipment for use with the new facility. Figure 2-6 details the existing wastewater treatment plant site. A treatment plant process diagram for the existing facility is represented in Figure 2-7.

Wastewater enters the treatment facility through two parallel 12-inch sewer mains. Each main line is fitted with a manually cleaned coarse bar screen to prevent large objects from passing into the treatment plant. Following coarse screening, wastewater passes to a raw sewage lift station.

The raw sewage lift station contains three vertically mounted, submerged impeller raw sewage pumps situated over a rectangular wet well. Under normal operations, one pump (Pump No. 3) operates as the lead lift pump with the remaining two pumps alternating as lag pumps. An alternate operating scheme allows for the isolation of Pump No. 3, which results in an alternating lead-lag, or duplex, use of Pumps No. 1 and No. 2.

From the raw sewage lift station, wastewater is transported through a 12-inch ductile iron line to the hydrosieve screening facility just north of the activated sludge process units. Wastewater enters a small reservoir on the back side of the hydrosieve, then passes over a weir and down onto the screened area of the hydrosieve. The screen surface is curved and inclined at approximately 45 degrees to promote solids transport down the face of the screen. Screenings rolling off the hydrosieve are collected in a dumpster for disposal. The hydrosieve is a passive screen and relies only on gravity for continuous cleaning. System operators must perform regular screen washdowns to

prevent solids blinding of the screen surface. Screened wastewater leaving the hydrosieve drops into a rectangular wet well used in the ABF tower recirculation system.

The ABF recirculation system consists of a wet well/dry well pump station configuration with the wet well directly under the hydrosieve and the dry well under the plant operations center. The recirculation pumping system was originally constructed with two 800-gpm and two 1,350-gpm flooded suction centrifugal pumps. The pumps were originally configured in pairs, with each pair including a large pump and a small pump. The intent was to utilize one pump pair, either a single pump or two in combination, with a standby pump pair available. As flows to the treatment facility increased, the City rewired the pumping system to allow for tandem use of the two larger pumps. This was necessary because neither pump pair, as originally configured, could produce the intended flow through the ABF tower.

In 1996, the City replaced the ABF recirculation pumping system with four new vertically mounted, suction-flooded pump assemblies and a new pump control panel. Each of the new pumps is designed for a flow of 1,300 gpm and can be operated singly or in any combination with the remaining pumps. Redundancy is now available in the ABF tower recirculation pumping system.

Recirculation pumps deliver screened wastewater and recycled flows to the top of the ABF tower. The ABF tower comprises the first stage of a two-stage biological treatment system. Horizontally oriented redwood slats are stacked through an active tower volume of slightly more than 8,000 ft^3. The ABF tower was intended to provide up to 65 percent BOD removal through the fixed film system with additional BOD removal in short-term aeration basins following the tower. However, tower performance has not been verified through sampling and is suspected to be less efficient than originally anticipated. The design organic loading rate on the ABF tower is approximately 230 lbs/BOD/day/1,000 ft^3, but manufacturer's literature suggests the design range can be between 100 and 350 lbs/day/1,000 ft^3 for carbonaceous BOD removal. The design flow through the tower is approximately 1.9 MGD, or 1,320 gpm. However, flow is a secondary design parameter to organic loading.

Wastewater and recycled flows percolating through the ABF tower are collected in an underdrain system and delivered back to the recirculation pump station wet well. Overflow from the recirculation wet well passes across a weir along one wall of the wet well and on to the aeration basins.

Two activated sludge aeration basins serve to complete biological treatment initiated in the ABF tower. Wastewater enters each rectangular basin at one corner and exits through a diagonally opposite corner. Aeration is provided by a combination of three rotary positive displacement blowers, an air manifold system, and submersible pumps in each aeration basin. Air is supplied to the manifold by the blowers, and mixed liquor in the aeration basin is forced through the manifold by each submersible pump. The manifold distributes the mixed liquor/air mixture along the length of the manifold, thereby creating turbulent currents in each basin.

Aeration basin overflow, or mixed liquor, is collected through a common 12-inch line leading to the two secondary clarifiers. Mixed liquor is delivered to the west end of each clarifier through a single 12-inch pipe. Mixed liquor is deflected downward and laterally through the clarifier by a deflector plate submerged in each basin. A rail-mounted sludge siphon pipe and surface skimmer mechanism operates along the length of each clarifier. Secondary clarifier solids are collected through a siphon intake line on the bottom of the sludge collector and are delivered to a sludge trough that directs settled solids out of each clarifier. Surface scum and floatable solids are raked to the west end of each clarifier where they are dropped into a trough and fed through a 3-inch scum line to the aerobic digesters. This 3-inch line is prone to plugging so operators regularly feed water to this line to keep it free of obstructions. This results in the undesirable consequence of additional water being added to the aerobic digesters. Clarifier effluent is collected in an effluent trough after passing over effluent weirs along the north and south walls of each clarifier.

A sludge and scum pump station is located at the east end of the clarifiers and serves to distribute scum and sludge flows to various points through the plant. Scum from the secondary clarifiers is delivered to a stilling well, which feeds a float controlled scum pump. As modified by City staff, the scum pump delivers scum directly to the aerobic digesters. Settled activated sludge from the clarifiers is delivered to a separate wet well. Two, dry-pit-mounted, float controlled sludge pumps are used to deliver activated sludge from the wet well to an elevated sludge splitter box. Originally, the sludge splitter box utilized a weir system to split the sludge flow into a recycle flow and a wasted flow. Recycle flow, or return activated sludge, is directed back to the ABF tower recirculation system. Waste activated sludge could be diverted from the sludge flow splitter to the aerobic digesters. However, due to overflow and freezing problems at the splitter box, the City has modified the box to only deliver return-activated sludge to the ABF tower recirculation system. Waste activated sludge is wasted to the digesters by opening a valve between the scum and sludge wet wells at the sludge and scum pump station, which allows sludge to drain into the scum wet well. The scum pump is operated for a period of time to waste sludge to the digesters.

Disinfection is accomplished through the use of chlorine gas, a jet pump injection system, and two identical chlorine contact basins. Chlorine gas and water are mixed in the chlorine room of the lab/blower building, and a chlorine solution is delivered to a stilling well at the head of the contact basins. A submersible jet pump and reactor tube are used to mix chlorine solution with secondary clarifier effluent in the stilling well. Disinfected effluent from each contact basin is directed over a single 90-degree, V-notch weir to an outfall basin. An ultrasonic sensor mounted over the contact basin outlet just upstream of the V-notch weir is used with a flow recorder in the operations room to measure instantaneous and totalized flows through the system. Treated effluent is directed through 16- and 24-inch piping to the Columbia River outfall.

Two identical, rectangular aerobic digesters are used to provide sludge stabilization. Each digester is fitted with a single jet aerator that is used to inject air and mix the contents of the digester. Digested liquid sludge is transported by truck to

agricultural fields for application. Digester supernatant is drawn off each digester through a telescoping valve and is directed back to the raw sewage lift station.

Design criteria for the overall plant and individual plant components are summarized in Table 2-1. Note that the overall average design flow was downgraded from 1.0 MGD to 0.8 MGD by the DEQ based on a cursory capacity analysis performed by the City.

DISPOSAL SYSTEMS

Effluent Outfall. Treated wastewater from the wastewater treatment plant is discharged to the Columbia River through a 24-inch diameter, concrete encased, single-port, ductile iron pipeline. The outfall port lies at approximately 262 feet above mean sea level, which yields a 3-foot water depth over the outfall port when Lake Umatilla is held at elevation 265 feet. The outfall extends approximately 20 feet horizontally from the river's shoreline.

In January 1995, the Corps of Engineers evaluated the possibility of extending the City's outfall approximately 265 feet. This would allow for similar water coverage conditions if Lake Umatilla was drawn down to 257 feet above mean sea level (minimum operating pool) as part of salmon migration enhancement efforts. The Corps' initial Design Report is included in Appendix C.

Since 1995, the National Marine Fisheries Service, Northwest Power Planning Council, and the U.S. Congress have decided to evaluate other river level flow conditions, including elevation 210 feet (spillway crest), elevation 160 feet (run of the river), and a "no change" alternative. According to the Corps of Engineers, operation of Lake Umatilla at elevation 257 feet is no longer an option.

Biosolids Land Application. Aerobically digested sludges, or biosolids, are currently applied in liquid form at two separate DEQ-approved sites. The City owns a 17.5-acre site where biosolids are applied to Siberian Wheatgrass (13.5 acres) and hybrid poplar trees (4 acres). The City also applies biosolids to alfalfa on a 7.7-acre parcel between downtown Umatilla and McNary. Biosolids application sites are described in Appendix D.

The City anticipates that more land application sites will be made available by local farmers if the City is able to produce biosolids in dry form. Cake solids are typically more acceptable to area farmers as they can be applied without the unsightly mess often associated with liquid sludges. In addition, a dried biosolids product would meet 40 CFR 503 vector attraction reduction criteria.

As mentioned in Chapter 1, the City of Umatilla investigated the possibility of constructing new sludge drying beds to allow for the production of dried biosolids, as well as to increase operational flexibility in the City's biosolids program. However, plans to construct new drying beds were suspended at least until land acquisition became possible.

Excerpts from the 1995 Feasibility Study for Sludge Drying Beds are included in Appendix E.

HISTORIC WASTEWATER FLOWS AND LOADS

Flows and loads received at the treatment facility since 1994 are summarized in Table 2-2. This data is used in Chapter 3 as a basis for projecting future flows and loads from residential, commercial, and industrial sources.

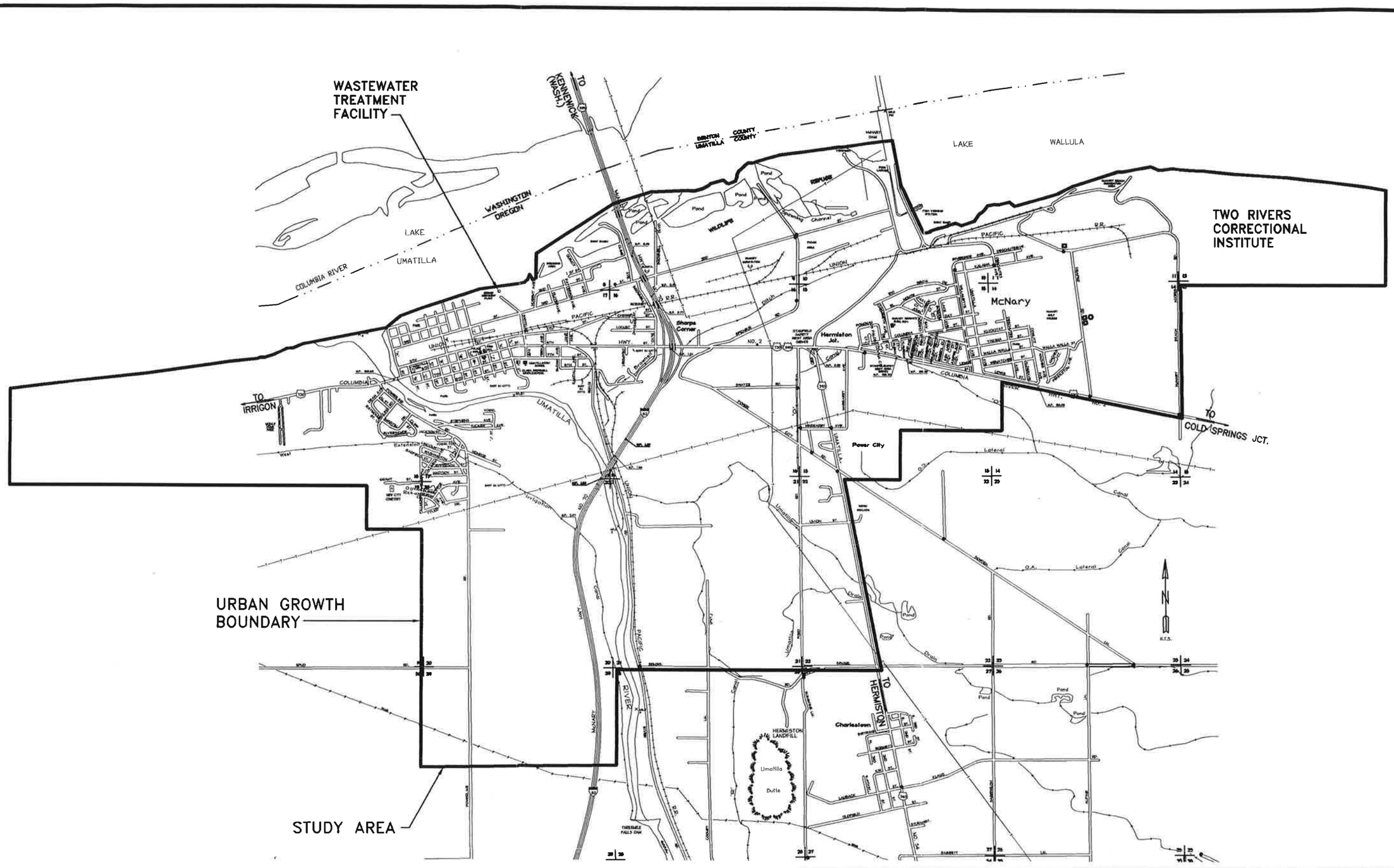
TREATMENT PLANT SITE CONDITIONS

Construction of the John Day Dam was completed in 1968. During construction of this dam, the U.S. Army Corps of Engineers obtained land on both sides of the Columbia River in the area estimated to be covered by the backwater created by the dam. Most of the City of Umatilla's wastewater treatment plant is located on land owned by the federal government that is not under water. This land is utilized by the City of Umatilla through easements and leases from the Corps of Engineers. Corps of Engineers' records show that the City owns approximately 1/2 acre of the existing 4-acre treatment plant site.

In order to provide additional space for the possible construction of sludge drying beds, the City of Umatilla initiated a land purchase request through the Corps of Engineers. The land purchase request was for the 3 1/2 acres the City already utilizes through lease or easement and for an additional 5 1/2 acres south and west of the treatment plant to provide room for sludge drying bed construction, for a total land purchase request of approximately 9 acres. The land purchase request has not been fully processed through the Corps, but the City is continuing efforts to obtain this land outright.

In order to upgrade the wastewater treatment facilities, additional land beyond the existing 4-acre site will be needed. The City can either continue to seek the additional Corps of Engineers' 5-1/2 acre site, or purchase the Port of Umatilla parcel to the east of the treatment plant site. Preliminary site planning for the anticipated upgrade of the existing wastewater treatment plant indicates a total acreage need of 9 to 10 acres, which would include the existing wastewater treatment plant site.

There are no known special characteristics such as archeological sites, wetlands, etc., on either parcel the City is evaluating for purchase. A more detailed site review will be required when the City identifies the parcel that will be utilized.

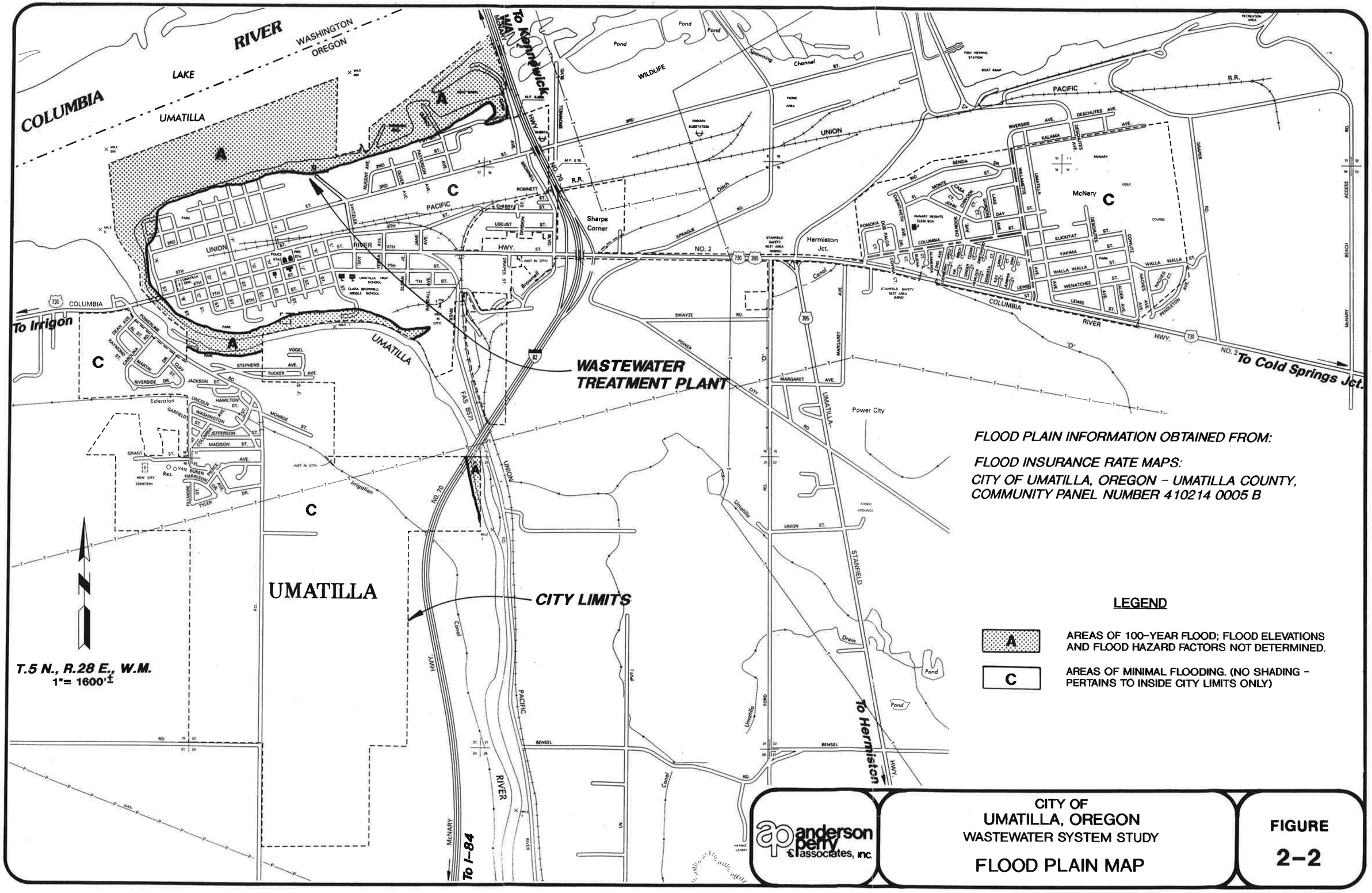


anderson perry

CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
STUDY AREA

FIGURE
2-1

PATH: J:\UMATILLA\WASTEWATER\STUDY\FIG2-1



FLOOD PLAIN INFORMATION OBTAINED FROM:

FLOOD INSURANCE RATE MAPS:
CITY OF UMATILLA, OREGON – UMATILLA COUNTY, COMMUNITY PANEL NUMBER 410214 0005 B

LEGEND

A	AREAS OF 100-YEAR FLOOD; FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS NOT DETERMINED.
C	AREAS OF MINIMAL FLOODING. (NO SHADING – PERTAINS TO INSIDE CITY LIMITS ONLY)

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY

FLOOD PLAIN MAP

FIGURE
2-2

165151

N

SCALE: 1"=1200'

WASTEWATER TREATMENT FACILITY

SOUTHWEST SEWAGE LIFT STATION

WILDWOOD LANE SEWAGE LIFT STATION

McNARY SEWAGE LIFT STATION

JOHNS MANSVILLE

TWO RIVERS CORRECTIONAL INSTITUTE

GILROY FOODS

URBAN GROWTH BOUNDARY

CITY LIMITS

TO HERMISTON

TO COLD SPRINGS JCT.

TO IRRIGON

TO HENDRICK (HIGH)

COLUMBIA RIVER

LAKE UMATILLA

LAKE WALLULA

WASHINGTON

OREGON

BENTON COUNTY

UMATILLA COUNTY

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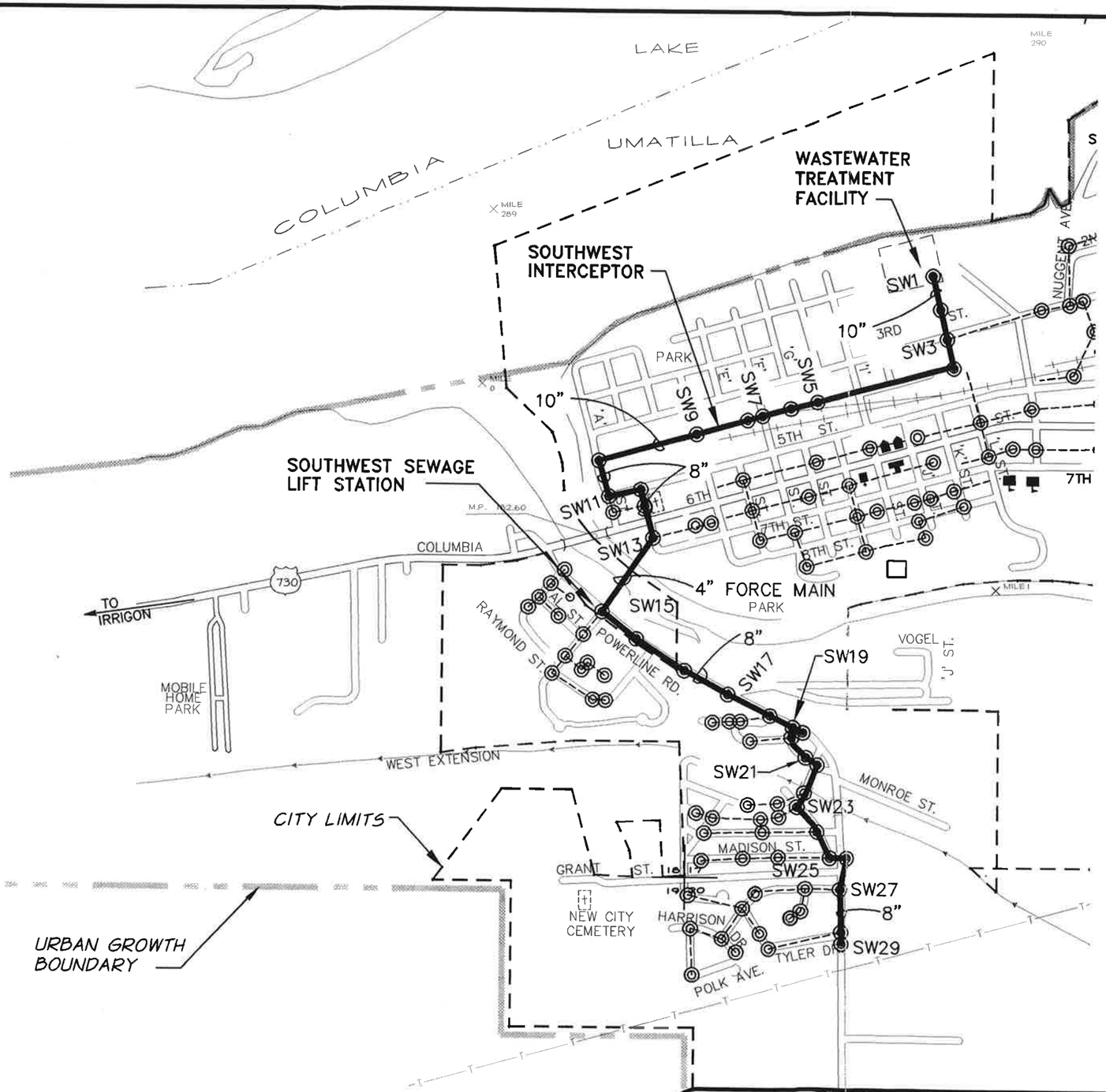
CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
EXISTING WASTEWATER COLLECTION SYSTEM

FIGURE
2-3

PATH: J:\UMATCITY\WASTE\STUDY\OVERALL.DWG



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CITY OF
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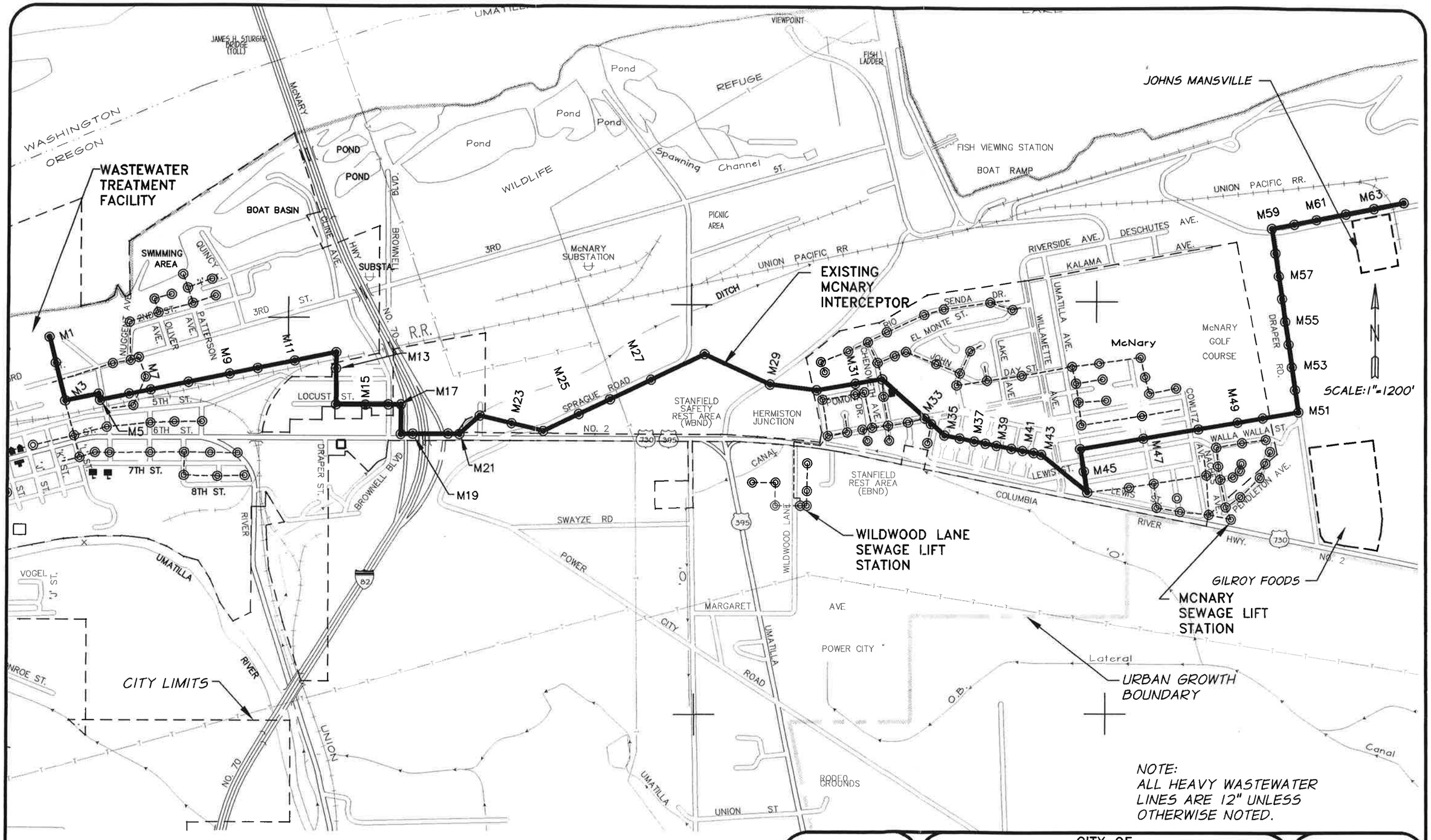
WASTEWATER SYSTEM STUDY
EXISTING SOUTHWEST INTERCEPTOR

FIGURE
2-4

Y:\UMATCITY\STUDY\FIG2-4.DWG



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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
EXISTING McNARY INTERCEPTOR

FIGURE
2-5

SWITZLER AVE.

SCALE : 1"=80'

COLUMBIA RIVER

EXTG. ACCESS ROAD

APPROX. LOCATION OF 2" WATER SERVICE LINE

LAB/BLOWER BLDG.

ABANDONED SLUDGE DRYING BEDS

EXTG. STORAGE

HYDROSIEVE AND ABF WET WELL

FLOWMETER

CHLORINE CONTACT BASINS

AERATION BASIN

SECONDARY CLARIFIER

SECONDARY CLARIFIER

AEROBIC DIGESTERS

ABF TOWER

COARSE BAR SCREEN

THIRD STREET

12" AC PIPE

12" AC PIPE

McNARY INTERCEPTOR

SOUTH HILL INTERCEPTOR

16" OUTFALL

24" DI OUTFALL

18"

RAW SEWAGE LIFT STATION

COARSE BAR SCREEN

CULVERT

ABANDONED CONTACT STABILIZATION BASIN

ABANDONED AEROBIC DIGESTER

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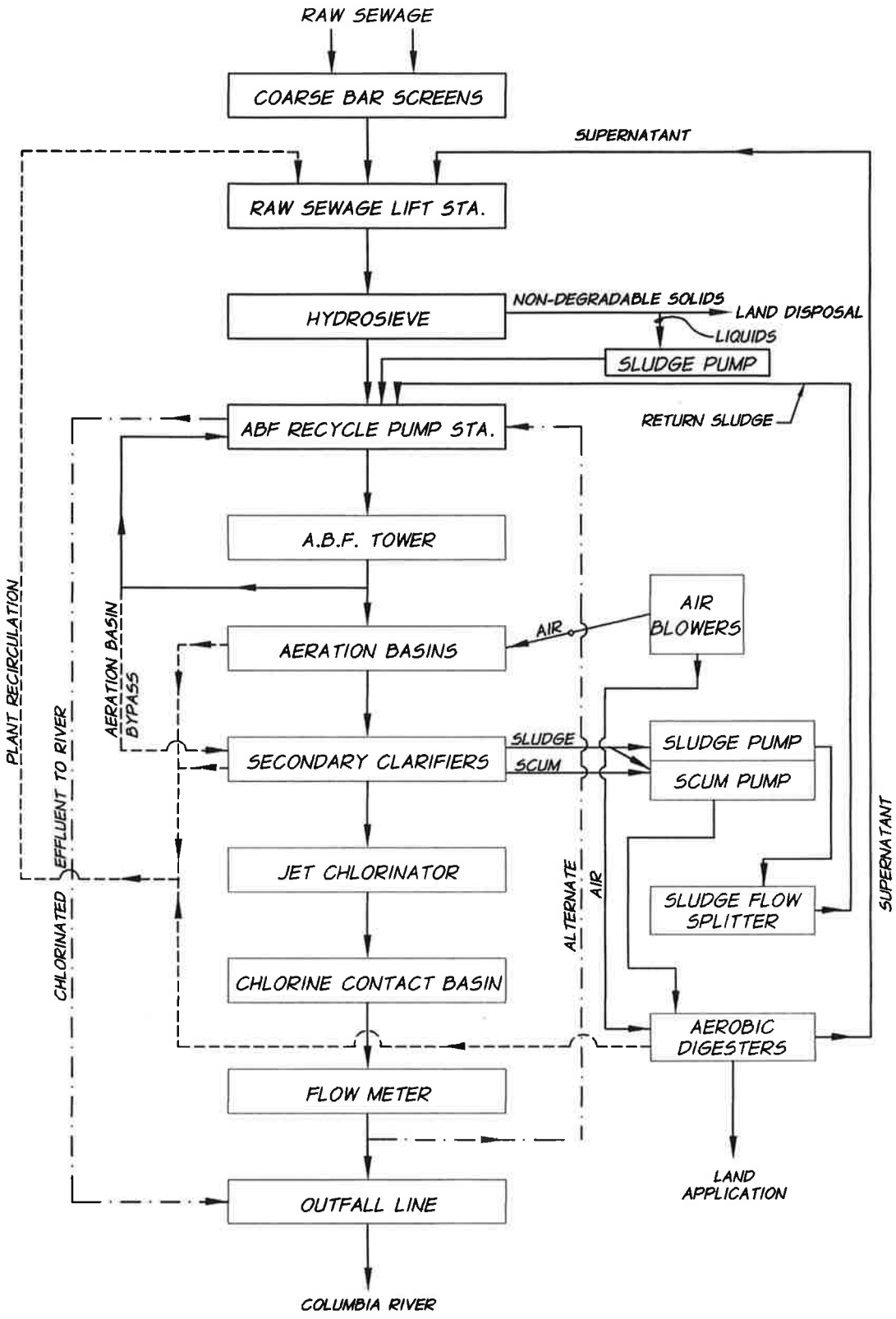
CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
EXISTING WASTEWATER TREATMENT FACILITY

FIGURE
2-6



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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
EXISTING TREATMENT PLANT
PROCESS DIAGRAM

FIGURE
2-7

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY

Design Criteria
Existing Wastewater Treatment Facility
(From 1979 O&M Manual; Tenneson Engineering Corp.)*

Design Flows and Loads	
Average Flow	0.8 MGD (originally 1.0 MGD)
Maximum Flow	2.25 MGD
BOD	1,877 ppd
TSS	1,836 ppd
Raw Sewage Lift Station	
Pump No. 1	7.5 Hp; 700 gpm at 27 ft. TDH
Pump No. 2	7.5 Hp; 700 gpm at 27 ft. TDH
Pump No. 3	7.5 Hp; 200 gpm at 24 ft. TDH
Hydrasieve	
Dimensions	48 inches x 72 inches
Peak Flow	1.75 MGD
Head Loss	Approximately 55 inches
ABF Tower and Recirculation System	
Recirculation Pumps	4 each, 15 Hp; 1,300 gpm at 30 ft. TDH
ABF Tower	24' x 24' x 14'; 8,000 ft^3 (active volume)
Recycle Ratio	1.9 Q
Organic Loading Rate	230 lbs BOD/day/1,000 ft^3
Aeration Basins	
Number and Size	2 at 26,350 gallons each
Design Capacity	0.5 MGD each, 1.0 MGD combined
Detention Time at 1.0 MGD	1.26 hours
Design BOD Loading	657 lbs. BOD/day with 2 basins
Secondary Clarifiers	
Number and Size	2 at 1,200 square feet each
Design Capacity	0.5 MGD each, 1.0 MGD combined
Design Surface Overflow Rate	417 gpd/ft^2
Disinfection System	
Chlorinator Capacity	150 lbs. Cl_2/day
Contact Basins	2 each
Design Capacity	0.5 MGD each, 1.0 MGD combined
Detention Time at 1.0 MGD	1 hour
Aerobic Digesters	
Number and Size	2 at 114,350 gallons each
Detention Time (combined)	36 days at 1.5 percent solids
Design TSS Loading	954 lbs/day
Design VSS Loading	668 lbs/day

* See Chapter 4 - Existing Wastewater Treatment System Evaluation.

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
EXISTING WASTEWATER TREATMENT FACILITY DESIGN CRITERIA

TABLE 2-1

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
HISTORIC FLOWS AND LOADS

Date	Month Average Flow (MGD)	Peak Flow (MGD)	Month Average BOD (mg/L)	Month Average TSS (mg/L)	Month Average BOD Load (ppd)	Month Average TSS Load (ppd)	Comments
Jan-94	0.394	0.639	325	175	1068	575	
Feb-94	0.386	0.411	300	170	966	547	
Mar-94	0.346	0.406	256	153	739	442	Onion Plant Off-Line
Apr-94	0.347	0.489	274	207	793	599	
May-94	0.364	0.493	275	255	835	774	
Jun-94	0.375	0.417	264	206	826	644	
Jul-94	0.399	0.474	223	199	742	662	
Aug-94	0.449	0.616	317	310	1187	1161	Onion Plant On-line
Sep-94	0.448	0.492	323	223	1207	833	
Oct-94	0.403	0.470	349	315	1173	1059	
Nov-94	0.386	0.431	343	339	1104	1091	
Dec-94	0.368	0.569	346	298	1062	915	
Jan-95	0.401	0.444	384	287	1284	960	
Feb-95	0.415	0.453	352	265	1218	917	
Mar-95	0.362	0.425	313	303	945	915	Onion Plant Off-Line
Apr-95	0.307	0.354	286	214	732	548	
May-95	0.326	0.374	219	171	595	465	
Jun-95	0.333	0.393	214	141	594	392	
Jul-95	0.358	0.408	219	161	654	481	
Aug-95	---	---	---	---	---	---	
Sep-95	0.425	0.478	262	220	929	780	Onion Plant On-line
Oct-95	0.394	0.450	259	262	851	861	
Nov-95	0.395	0.489	260	180	857	593	
Dec-95	0.427	0.655	254	198	905	705	
Jan-96	0.386	0.536	264	197	850	634	
Feb-96	0.409	0.502	259	186	883	634	
Mar-96	0.353	0.409	237	193	698	568	Onion Plant Off-Line
Apr-96	0.347	0.417	258	182	747	527	
May-96	0.343	0.406	244	181	698	518	
Jun-96	0.353	0.430	235	198	692	583	
Jul-96	0.373	0.423	191	150	594	467	
Aug-96	0.405	0.525	237	221	801	746	Onion Plant On-line
Sep-96	0.436	0.503	257	185	935	673	
Oct-96	0.441	0.521	251	244	923	897	
Nov-96	0.437	0.527	249	172	908	627	
Dec-96	0.399	0.483	259	179	862	596	
Jan-97	0.402	0.436	266	163	892	546	
Feb-97	0.404	0.446	284	192	957	647	Onion Plant Off-Line
Mar-97	0.331	0.417	241	165	665	455	
Averages for City	0.350		242	187	705	547	Onion Plant Off-Line
Averages for City + Onion Plant	0.412		289	234	991	802	Onion Plant On-Line

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY

HISTORIC FLOWS AND LOADS

TABLE 2-2

CHAPTER 3

DESIGN CRITERIA

In this chapter, study area characteristics, land use patterns, and population and economic growth predictions are used to develop future design flows and loads for the City of Umatilla's wastewater system. Influent design flows and loads and anticipated discharge requirements are then used to develop overall wastewater system design criteria. These design criteria will form the basis for selecting appropriate wastewater system improvement alternatives.

LAND USE

The City of Umatilla's zoning map divides the Urban Growth Area (UGA) into twelve land use categories (refer to Figure 3-1). The land use categories are suburban residential, single family residential, multi-family residential, multi-family residential (apartments), mobile home park/subdivision, community service, commercial, industrial, public facilities, recreation-open space, natural resource and floodplain.

Suburban Residential (SR). SR zoning allows one single family detached dwelling structure on each lot, including manufactured homes meeting certain criteria. The minimum lot size allowed under SR zoning is one acre.

Single Family Residential (R1). One single family detached dwelling structure on each lot, including manufactured homes meeting certain criteria, is allowed under R1 zoning. The zone ordinance requires that lot sizes be maintained at a minimum of 8,000 square feet.

Multi-Family Residential (R2). The housing density allowed in R2 zoning areas is dependent on the size of the dwelling structure. The zoning code requires the following as a minimum:

Single family structure	6,000 ft^2 (7 units/acre)
Two family structure	8,000 ft^2 (10 units/acre)
Three family structure	10,000 ft^2 (13 units/acre)
Four family structure	12,000 ft^2 (14 units/acre)

Multi-Family Residential-Apartments (R3). The zoning ordinance specifies lot density allowed in R3 zoning in terms of the minimum area of the lot and maximum structural coverage on the lot. The following is required as a minimum:

First unit	7,000 ft^2 and not to exceed 50 Percent lot coverage
Each additional unit	1,600 ft^2

Mobile Home Park/Subdivision (MH). The minimum area required for a mobile home park is two acres and shall have a maximum of seven units per gross acre. For each unit, exclusive of required setbacks, a minimum of 250 square feet of outdoor recreational uses shall be provided. The minimum lot size required for mobile home subdivisions is 6,000 square feet.

Community Service (CS). CS zoning areas allow for the construction of items necessary to provide community service such as day care facilities, schools, churches, parks, cemeteries, hospitals, and public utilities. Construction of residential housing is not allowed within CS zoning areas.

Commercial (C). The zoning ordinance does not set forth any minimum lot sizes for particular commercial establishments. However, the zoning ordinance specifies that each lot shall have yards of the following size as a minimum:

Side yard, when adjacent to a residential zone	20 ft.
Rear yard, when adjacent to a residential zone	20 ft.

Industrial (M). Two categories of industrial uses are specified in the City's zoning ordinance. The two categories are light industrial (M-1) and heavy industrial (M-2). M-1 uses can include automobile service stations and retail mini-market facilities. M-2 uses can include automobile wrecking yards, commercial gravel pits, junkyards, planned industrial developments, surface mines, and rock crushing or asphalt plants. The following minimum requirements apply to M-1 and M-2 zones:

M-1 Zones

Side yard adjacent to residential zone	20 ft.
Side yard on street side of corner lot	15 ft.
Rear yard adjacent to residential zone	20 ft.
When a street is a zone separation	15 ft.

M-2 Zones

Setback requirements	30 ft. from lot line
Lot Area	As determined by Department of Environmental Quality to be necessary for the protection of public health.

Floodplain (FP). Uses permitted in an FP zone can include agricultural, boat landings and docks, golf courses and driving ranges, parks, playgrounds, and community centers. The purpose of the FP zone is to promote and protect public health and safety and to minimize flood losses by provisions designed to do the following:

1. Restrict or prohibit uses which are dangerous to health, safety, or property in times of flood or which cause increased flood heights;

2. Require that uses vulnerable to floods, including public facilities which serve such uses, be provided with flood protection at the time of initial construction;

3. Protect individuals from buying land which is unsuitable for some purposes because of flood hazard; and

4. Protect existing wildlife habitat.

The land use categories and locations of the land use are based upon the City's currently adopted Comprehensive Plan and existing zoning map. The City, however, is in the process of rezoning more than 100 acres of land from suburban residential to residential single family in southwest Umatilla. The council has approved the Comprehensive Plan amendment; however, the ordinance formalizing the rezoning is in the process of being drafted and approved.

POPULATION/ECONOMIC GROWTH

Residential and Commercial Sectors. The residential population of Umatilla is expected to grow rapidly in the next few years to accommodate new employees at TRCI, as well as some fraction of the new employees at the Wal-Mart Distribution Center, the Umatilla Army Depot Chemical Weapons Incinerator, the expanded Hinkle Railroad Yard, and other area projects. Many new workers moving to the City of Umatilla will bring their families, and secondary growth in the commercial sector will likely bring additional residents and businesses. Initially, residential growth is expected at a rapid rate as TRCI is constructed and staffed. Over the long term, residential growth is expected to moderate. An overall growth rate of 2.6 percent per year has been selected by the City Council as the average residential growth rate for the next 20 to 25 years. This growth rate will yield a future population of 6,000 in the year 2020, the design year for treatment facility improvements.

The commercial base in the City of Umatilla, including restaurants, service-oriented businesses, professional offices, etc., has generally developed to serve the basic commercial needs of City residents. Tourism has strengthened the City's economy in recent years, but commerce remains primarily focused around local residents. The City anticipates this situation will continue in the future. Therefore, a long-term growth rate of 2.6 percent per year is expected in the commercial sector to mirror residential growth.

Two Rivers Correctional Institute (TRCI). TRCI is expected to house 1,500 medium-security inmates and 100 minimum-security inmates, for a total of 1,600 prisoners at full occupancy. Approximately 550 permanent employees will be associated with the TRCI facility currently under construction.

The TRCI site is large enough to site a second 1,600-bed facility, and the City has requested direction from the DOC on whether or not to include a potential expansion in estimations of TRCI's impact on City utilities. The DOC has informed the City that an expansion at TRCI is not planned, and DOC will not provide capital funding to oversize collection, treatment, and disposal facilities in anticipation of a prison expansion.

Industrial Sector. Industrial facilities in the City of Umatilla include the ConAgra onion dehydration plant (formerly Gilroy Foods), J.M. Manufacturing pipe production facility, Boise Cascade log storage and chip yard, Hagerman Trucking, Oregon Potato, Western Farm Service, Cenex Soil Service, South Basin Packing, Pendleton Grain Growers, and Tidewater Barges. The onion dehydration plant, which operates seasonally at the Port of Umatilla's McNary Industrial Park, is by far the largest industrial wastewater customer connected to the City of Umatilla's sewer system. J.M. Manufacturing and Oregon Potato contribute occasional slug doses of wash water or diluted process water overflow to the sewer system but normally produce little more than domestic flows from employee restrooms, sinks, etc. The remaining industries do not deliver industrial wastewater to the City's sewer system, only domestic flows.

Future industrial growth in the City of Umatilla and at the Port of Umatilla's McNary Industrial Park is expected to be in low water use, secondary manufacturing type industries. The Port of Umatilla expects that high water use industries, such as food processors, will locate in the Hermiston and central west Umatilla County area. The City of Umatilla area is expected to attract specialized manufacturing industries that discharge domestic sewage from workers and a limited amount of process water. Therefore, industrial discharges to the City's wastewater system are expected to increase only moderately. The Port of Umatilla believes that industrial growth through 2020 will likely result in the delivery of industrial wastewater to the City at a rate of no more than 1.6 times the current onion facility contribution. This 60 percent growth rate will be used to project future industrial wastewater flows and strength loads.

DESIGN FLOWS AND LOADS

Anticipated wastewater design flows and loads through the year 2020 are projected in this section based on growth estimates for individual community sectors developed in the previous section.

Residential and Commercial Sources. Because residential and commercial growth rates are expected to be similar, the two sectors can be grouped together for wastewater planning purposes. Current wastewater flow and strength characteristics seen at the treatment facility, during times when the existing onion dehydration facility is not operating, can be projected at the 2.6 percent growth rate to estimate future average flows and loads from residential and commercial sources, as shown in Table 3-1.

Table 3-1
Residential and Commercial
Wastewater Projections at 2.6% Growth through 2020

	1997	2020
Population	3,310	6,000
Average Flow (MGD)	0.350	0.635
Average BOD (mg/L)	240	240
Average BOD (lbs/day)	705	1,280
Average TSS (mg/L)	190	190
Average TSS (lbs/day)	547	1,000

Two Rivers Correctional Institute (TRCI). Wastewater data from three other new prisons is used to project flows and loads from TRCI. Available data does not distinguish between inmate and corrections staff contributions. Therefore, "per inmate" contributions used in this analysis are based on total flows and loads from each prison and include corrections staff contributions. This assumes staffing levels are proportionate to inmate populations at all facilities.

Two Rivers will use various water saving features, including flow controlled toilets and sinks (but not showers), in prison cells. These devices are expected to result in lower wastewater flows from the prison than at older prison facilities with no water use controls. However, these devices are also expected to result in increased waste strength. Two Rivers will apparently have water saving devices and wastewater security controls similar to the Todd Road Jail facility in Ventura County, California. Therefore, wastewater data from the Ventura County Jail was obtained for estimating purposes. Only three months of data (January through March 1997) was supplied by Ventura County. This is not enough information to reliably characterize long-term flows and loads at the facility.

Wastewater data from the Snake River Correctional Institute (SRCI) at Ontario, Oregon, as supplied by the City of Ontario, was obtained as a second source of information for this analysis. SRCI data is from 1993-94 and several months in 1996-97. SRCI flows and loads for the period in between are not very useful, as substantial amounts of dilution water were added to the waste stream to control odors in the sewer system downstream of the prison. This dilution water skews flow and strength values.

Flow data was also obtained from the Sheridan Correctional Institution in Sheridan, Oregon. This prison was constructed in the early 1990's. Waste strength values are not available as the Sheridan prison flow is blended with municipal wastewater prior to sampling.

Additional flow and load information from existing prisons in Pendleton, Oregon, and Walla Walla, Washington, was reviewed for possible use in this analysis. However, both of these facilities are old and were not designed for efficient water use or waste control.

In addition, flow and load information from these facilities is generated through estimates and infrequent sampling, not regular flow monitoring and sampling programs. Therefore, data from these facilities is not used for projecting the impact of TRCI.

Table 3-2 projects average flows and loads at the TRCI facility based on the three modern facilities discussed above. The reader should be aware that wastewater system operators in Ontario and Ventura County report wide swings in wastewater flow and strength values. The City of Umatilla should also expect to see a wide range in flow, BOD, and TSS levels in the prison discharge.

Flow and load projections for TRCI have been developed with and accepted by the DOC. In addition to average design parameters listed in Table 3-2 , the DOC projects a normal peak hourly flow from TRCI at 800 gpm (5.8 peaking factor) based on the capacity of an on-site lift station. The peak flow from TRCI may be higher on rare occasions if more than one pump at the lift station is called into service.

Table 3-2
Average Wastewater Projections for TRCI
Based on Other Prisons

	Snake River 1993-94	Snake River 1996-97	Sheridan 1996	Todd Road 1997**	Two Rivers Projected
Inmates	350	850	1,950	520	1,600
Average Flow (MGD)	0.038	0.116	0.270	0.031	0.200
Average BOD (mg/L)	331	328	*	571	400
Average BOD (lbs/day)	101	310	--	147	670
Average TSS (mg/L)	304	350	*	361	400
Average TSS (lbs/day)	91	334	--	93	670
Flow, Per Inmate (gal/day)	109	136	140	59***	125
BOD, Per Inmate (lbs/day)	0.29	0.36	--	0.28	0.41
TSS, Per Inmate (lbs/day)	0.26	0.39	--	0.18	0.41

* City of Sheridan consultant reports high strength on the order of 400-500 mg/L BOD and TSS.
** Based on only 3 months of data from the Todd Road facility.
*** The average flow of 59 gal/day per inmate at Todd Road is much lower than the average flow at the two Oregon facilities. This is likely due, in part, to the water-saving features at Todd Road but may also be due to differences in prison operation between Oregon and California facilities and differences in water conservation efforts between the two states. Two Rivers will likely use less water per inmate than the other Oregon facilities but may not be as efficient as Todd Road because of differing water conservation perspectives in each state.

Industrial Sources. The onion plant discharges to the City's system on a seasonal basis. Using a flow chart recorder, the City records when the onion plant is on-line, so flow and strength estimates for the onion plant can be derived from the City's monthly monitoring reports. However, strict averages cannot be used due to the wide range in flow and strength of the plant's discharge. Instead, an approximation based on knowledge of

similar food processing plants is used to estimate this facility's contribution. During normal operating periods, the onion plant's contribution is estimated at 0.100 MGD, 500 lbs BOD/day, and 400 lbs TSS/day.

For wastewater planning purposes, a set-aside for new industry was established by the Port of Umatilla based on 0.6 times the existing contribution of the onion plant. This will facilitate buildout on 15 percent of the McNary Industrial Park's 411 acres through 2020, assuming wastewater will be generated at a rate of 1,000 gal/day/acre. Industrial growth contributions are projected in Table 3-3.

Table 3-3
Industrial Flow and Load
Projections Through 2020

	Onion Plant	Future Growth	Total
Average Flow (MGD)	0.100	0.060	0.160
Average BOD (lbs/day)	500	300	800
Average TSS (lbs/day)	400	240	640

Summary of Flow and Load Projections. The present approach will be to design and construct new or modified wastewater facilities that are capable of processing flows from the 1,600-bed facility currently under construction, and projected City and industrial flows. However, expansion capabilities will be included, where possible, to facilitate a second phase of prison construction at the Two Rivers site.

In addition to average flows and loads, peak flow or load events must be anticipated to properly size collection and treatment system components. Based on historic flows and loads received at the treatment plant since 1994, and design values provided by the DOC for TRCI's contribution, the following peaking factors have been developed:

Maximum Month Flow	=	1.1 x Average Flow
Maximum Day Flow	=	1.6 x Average Flow
Peak Hour Flow	=	3.2 x Average Flow
Maximum Month BOD Load	=	1.3 x Average BOD Load
Maximum Day BOD Load	=	1.5 x Average BOD Load
Maximum Month TSS Load	=	1.6 x Average TSS Load
Maximum Day TSS Load	=	2.1 x Average TSS Load

The peaking factors listed above will be used with average flow and load values to size new or modified treatment plant components. They are also used in Chapter 4 to evaluate the adequacy of existing wastewater treatment facilities. Overall design flows and loads, including peak events, are summarized in Table 3-4.

Table 3-4
Overall Design Flows and Loads

Design Parameter	Flow, MGD	BOD (lbs/day)	TSS (lbs/day)
City of Umatilla	0.635	1,280	1,000
TRCI	0.200	670	670
Industrial Sector	0.160	800	640
Average Design	1.00	2,750	2,310
Maximum Month Design	1.10	3,600	3,700
Maximum Day Design	1.6	4,100	4,800
Peak Hour Design	3.2	---	---

TREATMENT REQUIREMENTS

Current effluent limitations for the City of Umatilla's wastewater treatment facility, as given in the City's NPDES permit, are shown in Table 3-5. These limitations are based on minimum wastewater treatment requirements for the Umatilla Basin and Columbia River as established in OAR 340-41-655, additional State-wide requirements contained in OAR 340-41-120, and the permitted facility design flow of 0.8 MGD.

Table 3-5
Current Effluent Discharge Limitations

	Avg. Concentration (mg/L)		Mass Load Limits (lbs/day)*		
Parameter	Monthly	Weekly	Monthly	Weekly	Daily
May 1 - October 31 annually					
BOD_5	20	30	130	200	260
TSS	20	30	130	200	260
November 1 - April 30 annually					
BOD_5	30	45	200	300	400
TSS	30	45	200	300	400
Year Round					
Fecal Coliform Bacteria **	200/100 ml	400/100 ml			
pH	Within the range 6.0 to 9.0				
BOD_5 and TSS Removal (Min.)	85%				

* Mass loads are based on the average dry weather design flow of 0.8 MGD.
** Fecal coliform bacteria limitations are based on geometric mean.

A new or expanded wastewater treatment facility will need to treat significantly higher wastewater flows and loads than have been experienced previously. A request has been made to the DEQ to modify NPDES permit limits to reflect anticipated future flows and loads. Based on preliminary discussions with DEQ, it is anticipated that concentration-based limits for BOD and TSS will remain the same and mass load limits will increase proportionate to the increase in average design flow (0.8 MGD to 1.0 MGD). However, DEQ has indicated that a new limitation will be established for chlorine residual in the City's effluent to control potential toxic impacts to aquatic life. In addition, the basis for a bacteria limit will shift from fecal coliform to E. coli bacteria to reflect a recent rule change. A new limitation on ammonia, another potentially toxic substance, will not be not necessary as the City will complete outfall improvements to increase dilution in the effluent mixing zone. As discussed in Chapter 5, any of the river discharge alternatives will be paired with a 250-foot outfall extension. The extension will place the end of the outfall in an area exhibiting better flow and shear characteristics than are presently found near the existing outfall. Up to three ports will be installed at the end of the outfall to distribute effluent throughout the mixing zone. Port orientation and spacing will be determined during the design stage once the river bottom profile is established. The outfall extension will be used to control concentrations of ammonia in the mixing zone rather than ammonia removal through nitrification at the treatment facility. Additional tankage and aeration capacity to promote nitrification at the treatment facility would be excessively expensive. Anticipated permit limitations are shown in Table 3-6.

Table 3-6
Expected Effluent Discharge Limitations
(Following Treatment Plant Upgrade)

	Avg. Concentration (mg/L)		Mass Load Limits (lbs/day)*		
Parameter	**Monthly**	**Weekly**	**Monthly**	**Weekly**	**Daily**
May 1 - October 31 annually					
BOD_5	20	30	170	250	330
TSS	20	30	170	250	330
November 1 - April 30 annually					
BOD_5	30	45	250	380	500
TSS	30	45	250	380	500
Year Round					
E. coli Bacteria **	126/100 ml	406/100 ml			
pH	Within the range 6.0 to 9.0				
BOD_5 and TSS Removal (Min.)	85%				
Chlorine Residual (TRC)	0.02 mg/L daily maximum				

* Mass loads are based on the average dry weather design flow of 1.0 MGD for the upgraded plant.
** E. coli bacteria limitations are based on geometric mean.

In addition to liquid treatment requirements, 40 CFR 503 and OAR Chapter 340, Division 50, require minimum treatment standards for wastewater derived biosolids depending on the ultimate disposition of the finished product. As discussed in Chapter 1, biosolids treatment requirements include processes to significantly reduce pathogenic organisms and methods to reduce vector attraction characteristics of sludge. The City's practice of applying biosolids on agricultural lands requires treatment to produce a Class B product, at a minimum.

SUMMARY OF DESIGN CRITERIA

Wastewater treatment facilities must be designed to adequately process anticipated design flows and loads as well as meet minimum treatment requirements. Design flows and loads and minimum treatment requirements are combined in Table 3-7 to establish formal design criteria for the City of Umatilla's wastewater treatment facility improvements project.

Table 3-7
Wastewater System Design Criteria

Design Flows and Loadings

2020 Design Parameter	Flow, MGD	BOD (lbs/day)	TSS (lbs/day)
City of Umatilla	0.635	1,280	1,000
TRCI	0.200	670	670
Port of Umatilla Industrial Park	0.160	800	640
Average Design	1.00	2,750	2,310
Maximum Month Design	1.10	3,600	3,700
Maximum Day Design	1.6	4,100	4,800
Peak Hour Design	3.2	---	---

Treatment Requirements

	Average Concentrations (mg/L)		Mass Load Limits (lbs/day)*		
Parameter	Monthly	Weekly	Monthly Average	Weekly Average	Daily Maximum
May 1 - October 31					
BOD_5	20	30	170	250	330
TSS	20	30	170	250	330
November 1 - April 30					
BOD_5	30	45	250	380	500
TSS	30	45	250	380	500
Year-Round					
E. coli Bacteria	126/100 mL	406/100 mL	(geometric mean)		
pH	Within range 6.0 to 9.0				
BOD & TSS Removal	85%				
Chlorine	0.02 mg/L daily maximum				
Biosolids Treatment	Class B				

* Mass loads are based on a future average annual design flow of 1.0 MGD.

CITY LIMITS

URBAN GROWTH BOUNDARY

LAND USE LEGEND

- RESIDENTIAL — R1
- MOBILE HOME PARK SUBDIVISION — MH
- RESIDENTIAL — R2
- RESIDENTIAL MULTI-FAMILY — R3
- SUBURBAN RESIDENTIAL — SR
- COMMERCIAL — C
- COMMUNITY SERVICE — CS
- INDUSTRIAL — M
- RECREATION/ OPEN SPACE — ROS
- FLOOD PLAIN — FP
- NATURAL RESOURCE — NR
- PUBLIC FACILITY — PF

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
EXISTING LAND USE

FIGURE
3-1

CHAPTER 4

EXISTING WASTEWATER SYSTEM EVALUATION

COLLECTION SYSTEM EVALUATION

Introduction. This section of the Wastewater System Study discusses hydraulic capacity evaluations that were completed on the Southwest and McNary Interceptors and the Southwest, McNary, and Wildwood sewage lift stations. The purpose of the evaluations are to estimate the hydraulic capacity of the existing interceptors and lift stations and compare the capacities with several assumed future flow scenarios.

Three general steps are required to complete the capacity evaluations on each system. First, the design peak hour flow rates must be estimated based upon an assumed growth scenario. Second, portions of the flows obtained from completion of step 1 must be allocated to specific sections of the system (assume points in the system where portions of the flow enters the interceptor). This would relate to growth patterns. Third, once the flows have been estimated and allocated, a comparison of the flows to the capacity of the interceptors must be competed. The same basic procedures are necessary for evaluation of the sewage lift stations. Based upon the capacity evaluations of the interceptors and lift stations, a proposed collection system improvements plan is outlined (refer to Chapter 5 for a discussion and cost estimates of the proposed collection system improvements).

Southwest System. To complete the Southwest system evaluation, two growth scenarios were assumed and, based upon these two scenarios, future flows estimated and allocated to specific sections of the system. The two scenarios are subsequently referred to as SH-1 and SH-2.

Scenario SH-1 projected flows are estimated using two components. The two components assumed to be contributing wastewater to the system are the existing developments plus resulting development from 50 percent of the 2020 projected population increase. It is further assumed that all the development resulting from the population growth will occur in southwest Umatilla in the vicinity of Power Line Road.

In order to estimate the existing peak hour flow in the system, the circular flow recording charts were reviewed for the period between May 1993 through September 14, 1997. Since the flow measured and recorded at the wastewater treatment plant is a combination of the flows from the Southwest and McNary systems, estimating the ratio of peak hour flow experienced in the Southwest system to that in the McNary system required that a direct measurement of the peak hour flows from the Southwest and McNary systems be done to determine the relative flows. Consequently, the relative flows associated with the existing developments served by the Southwest and McNary systems were estimated by using weirs installed at the headworks (at the inlet to the coarse manually cleaned bar screens). Flow readings were taken at the same time from each system during the one-day period, every 5 to 10 minutes, and recorded. Based upon the September 16, 1997 flow measurements, the relative amount of peak flow from the McNary system and the Southwest system was about 58 percent and 42 percent, respectively. Therefore, for purposes of this analysis, it will be assumed that the existing total peak hour flow contributed from the Southwest system is 42 percent of the total effluent peak hour flow

recorded at the WWTF. According to the circular flow recording charts, the peak hour flow occurred at about 11:00 p.m. on Sunday, March 16, 1997, and was approximately 0.89 mgd. This peak flow does not include flow contribution from ConAgra in the McNary Industrial Park. Hence, the approximate existing Southwest system total peak hour flow is 0.374 mgd.

The document entitled City of Umatilla, Oregon, *Southwest Utility Extension Study*, 1997, prepared by Anderson·Perry and Associates, Inc., developed estimated peak hour flows contributed from the existing southwest Umatilla developments, as well as anticipated flows from future development. The peak hour flows developed in that study will be used as part of this evaluation. Appendix F contains the Executive Summary of the Southwest Utility Extension Study. Based upon data presented in the Southwest Utility Extension Study, the estimated existing peak hour flow contributed from southwest Umatilla is 0.265 mgd. Given that the existing estimated total peak hour flow from the Southwest system is 0.374 mgd and the peak hour flow from southwest Umatilla is 0.265 mgd, the estimated peak hour flow contributed from downtown residential and commercial development is 0.109 mgd. The 2020 peak hour flow associated with 50 percent of the population growth expected (1,345 people) is estimated to be about 0.392 mgd (108 gpcd x 1,345 people x 2.70). Therefore, the total peak hour flow associated with Scenario SH-1 is 0.766 mgd.

Scenario SH-2 projected flows are also estimated based on using two components. The two components assumed to be contributing wastewater to the system in Scenario SH-2 are the existing developments plus full build-out of the southwest Umatilla area. As is the case with Scenario SH-1, Scenario SH-2 assumes that all the development resulting from the population growth will occur in southwest Umatilla adjacent to Power Line Road. As presented under Scenario SH-1, the total existing peak hour flow from the Southwest system is 0.374 mgd, and the estimated contribution from southwest Umatilla and the downtown area is 0.265 mgd and 0.109 mgd, respectively.

The Southwest Utility Extension Study developed estimated peak hour flows resulting from full build-out of the southwest Umatilla area. The full build-out peak hour flows developed in that study will be used in this evaluation. Based upon the results of the study, the estimated peak hour flow from full build-out of the undeveloped property within the southwest Umatilla area is 1.750 mgd. Therefore, the total estimated peak hour flow associated with Scenario SH-2 is 2.124 mgd. Refer to Table 4-1 for a summary of the Southwest system peak hour flows for both Scenarios SH-1 and SH-2.

As indicated above, step 2 in the evaluation is to allocate peak hour flows to specific locations within the system. Once the flows have been allocated, the accumulated flows within the system can be estimated. Table 4-2 shows the assumed allocation of flows (by manhole number) and summarizes the accumulated flow from the beginning of the system downstream to the treatment plant for both scenarios. Figure 2-4 shows the location of each manhole.

Step 3 in the evaluation is to estimate the hydraulic capacity of the interceptor for each reach between each set of manholes and compare the capacities to the accumulated peak hour flows. In order to estimate the capacity of the interceptor, the pipe size and grade of each reach was determined based upon "as-built" construction drawings supplemented with a field survey. The City only has as-built construction drawings of the sewer system that lies on the southwest side of the Umatilla River (those developments

served from the interceptor line that runs along Power Line Road). A survey was performed to determine the sewer grade of the interceptor where as-built drawings were not available. The survey consisted of determining the relative manhole invert elevations, the distances between manholes, and the sewer pipe sizes. The survey and as-builts indicated that the minimum 8-inch pipe slope is 0.0047 feet per foot, and the minimum 10-inch pipe slope is 0.0015 feet per foot. Refer to Table 4-3 for a comparison of the interceptor capacity to the peak hour wastewater flows for each reach in the Southwest system. For comparison purposes, the accumulated flows for each scenario are presented along with the hydraulic capacity of each reach with full pipe and two-thirds full pipe flow.

In general, sewers are designed to flow full only under peak flow conditions. It is general practice to design a sewer such that sufficient velocity is developed regularly to flush out any solids that may have been deposited during low flow periods. The usual practice is to design the slopes for sanitary sewers to ensure a minimum velocity of two feet per second with flow at one-half full or full. In order to accomplish this, the minimum design slope for a 10-inch gravity sewer is about 0.0025 feet per foot. With the existing minimum slope of 0.0015 of the 10-inch interceptor, the velocity at half-full depth is approximately 1.5 feet per second. Additionally, it is desirable to design a sewer to flow one-half full or less under average design flow conditions and not surcharge under peak flow conditions.

The results of the evaluation indicate that, with the exception of reaches 4, 5, 6, 7 and 10, the Southwest interceptor has capacity to handle the flows outlined under Scenario SH-1 (refer to Table 4-3). Those sections lacking sufficient capacity to handle Scenario SH-1 flows are all located east of the Umatilla River (i.e., section from manholes SH-13 to SH-1). The section of the Southwest interceptor that serves developments within southwest Umatilla (development west of the Umatilla River and adjacent to Power Line Road; from manholes SH-14 to SH-29) has capacity to handle Scenario SH-1 flows. Peak hour flows associated with Scenario SH-2 would overload the existing system in all sections but reaches 16, 20, 21, 26, and 27 (refer to Table 4-3). Additionally, the Southwest Sewage Lift Station is currently at capacity and an upgrade of the lift station will be necessary prior to occurrence of any development in the southwest Umatilla area. Refer to Chapter 5 for a discussion of the improvement alternatives and associated costs for the Southwest system.

McNary System. To complete the McNary system evaluation, five growth scenarios were assumed and, based upon these five scenarios, future flows estimated and allocated to specific sections of the system. The five scenarios are subsequently referred to as M-1, M-2, M-3, M-4 and M-5.

Scenario M-1 projected flows are estimated using two components. The two components contributing wastewater to the system are the existing residential and commercial developments served by the system and the existing McNary Industrial Park development, excluding ConAgra. As discussed above, the assumed existing total peak hour flow contributed from the McNary system is 58 percent of effluent peak flow as recorded on the circular recording charts, or 0.516 mgd. For purposes of allocating existing peak flows to specific locations within the McNary system, flow monitoring was done on July 2, 1997 at key manholes to estimate the relative peak flows associated with the existing developments within system. Based upon the flow monitoring results, the relative amount of peak flow from the McNary area is about 71 percent of the total McNary system flow, or 0.367 mgd. The remaining 29 percent of the peak flow, or 0.149 mgd, is

assumed to be contributed from the area in southeast Umatilla proper served by the McNary system. Furthermore, based upon the flow monitoring data, it is assumed that 15 percent of the McNary area peak flow (0.367 mgd) is contributed from the existing McNary Industrial Park, or 0.055 mgd, excluding ConAgra.

Scenario M-2 projected flows are estimated using three components. The three components consist of the two components outlined in Scenario M-1 plus 50 percent of the projected 2020 population increase. As presented under Scenario SH-1, the flow associated with 50 percent of the projected 2020 population increase is 0.392 mgd. The same existing peak flows and allocations are assumed for Scenario M-2 as those outlined under Scenario M-1. Therefore, the total peak flow from the McNary system for Scenario M-2 is 0.908 mgd.

Projected flows are estimated for Scenario M-3 based upon three components. The three components consist of the two components presented in Scenario M-1, and full buildout of the McNary area residential and commercial sectors. In order to estimate the peak hour flows associated with full build-out of the McNary area residential and commercial sectors, an analysis was completed to determine, under each of the City's land use categories, the estimated amount of undeveloped property available. Figure 4-1 shows the wastewater contribution areas used in the analysis. Based upon the City's zoning ordinance and the property available for development, the density of housing and commercial development, along with the estimated population and wastewater generation associated with full build-out development, was estimated. Refer to Table 4-4 and 4-5 for a summary of the analysis. According to the analysis, the estimated peak hour flow contributed from full build-out of undeveloped areas within the old McNary town site area and selected residential areas south of Highway 730 and east of Highway 395 is 0.747 mgd. Considering the three contributing flow components, the total peak hour flow for Scenario M-3 is 1.263 mgd.

Scenario M-4 flows are estimated using three components. The three components considered for Scenario M-4 consist of the two components outlined under Scenario M-1 and design peak hour flow from the Two Rivers Correctional Institute (TRCI). The planned TRCI Sewage Lift Station has a design capacity of 800 gpm (1.152 mgd). Therefore, under Scenario M-4, an interceptor line with a capacity of 1.668 MGD would be necessary to handle the peak hour flow from TRCI and the existing McNary area residential and commerical development.

Scenario M-5 considers three components to estimate the peak hour flows. The three components consist of the two components presented under Scenario M-1 and design peak hour flow from the build-out of McNary Industrial Park. As presented in Chapter 3, the 2020 estimated average annual industrial flow is 0.160 mgd. For evaluation purposes, a typical ratio of peak hour to average annual flow of 3.0 will be assumed for estimating the peak hour flow contributed from full build-out of McNary Industrial Park. Therefore, based upon the above assumptions, the design peak hour flow contributed from the McNary Industrial Park is 0.480 mgd. Therefore, including the existing peak hour flows contributed from the McNary area residential and commercial (0.516 mgd), the total peak hour flow for Scenario M-5 is 0.996 mgd.

As discussed previously, the next step in the evaluation is to allocate peak hour flows to specific locations within the system. Once the flows have been allocated, the accumulated flows within the system can be estimated. For the five scenarios outlined

above, it is assumed that allocation of the existing McNary area residential and commercial peak hour flows is the same for each scenario. Table 4-6 shows the assumed allocation of flows (by manhole number) and summarizes the accumulated flow from the beginning of the system downstream to the treatment plant for the five scenarios. Figure 2-5 shows the location of each manhole.

As with the Southwest system evaluation, Step 3 in the McNary system evaluation is to estimate the hydraulic capacity of the interceptor for each reach between each set of manholes and compare the capacities to the accumulated peak hour flows. In order to estimate the capacity of the interceptor, the pipe size and grade of each reach was determined based upon "as-built" construction drawings and supplemented with a field survey. The City only has as-built construction drawings of the sewer system for sections between manholes M-1 and M-15, M-25 and M-30, and M-50 and M-64. A survey was performed to determine the sewer grade of the interceptor where as-built drawings were not available. The survey consisted of determining the relative manhole invert elevations, the distances between manholes, and the sewer pipe sizes. The survey and as-builts indicated that the entire McNary interceptor is 12-inch pipe and has a minimum pipe grade of 0.0018 feet per foot. Refer to Table 4-7 for a comparison of the interceptor capacity to the peak hour wastewater flows for each reach in the McNary system. For comparison purposes, the accumulated flows for each scenario are presented along with the hydraulic capacity of each reach with full pipe and two-thirds full pipe flow.

As discussed previously, the usual practice is to design the slopes for sanitary sewers to ensure a minimum velocity of two feet per second with flow at one-half full or full. In order to accomplish this, the minimum design slope for a 12-inch gravity sewer is about 0.0022 feet per foot. With the existing minimum slope of 0.0018 of the 12-inch interceptor, the velocity at half-full or full depth is approximately 1.9 feet per second.

According to the evaluation, and as Table 4-7 indicates, the McNary interceptor has enough capacity to handle the peak hour flows associated with Scenarios M-1 and M-2. However, peak flows associated with Scenarios M-3 and M-4 would overload the existing interceptor in the majority of the system. Scenario M-3 flows would generally overload the interceptor from manhole M20 downstream to the treatment plant. Scenario M-4 flows would basically overload the system throughout the entire length of the interceptor with the exception of a few reaches. Therefore, based upon the evaluation, the existing McNary interceptor has enough capacity to handle the existing McNary area and southeast Umatilla residential and commercial and the anticipated residential and commercial growth in the McNary area. However, the interceptor does not have adequate capacity to handle both the anticipated flows resulting from residential and commercial growth in the McNary area and either the TRCI or full build-out of the McNary Industrial Park. Refer to Chapter 5 for a discussion of the improvement alternatives and associated costs for the McNary system.

Considering the locations and areas served by the McNary and Wildwood Lane Sewage Lift Stations, it appears that the capacity of both lift stations is adequate to handle the flows anticipated in all five scenarios. As discussed previously, the McNary Sewage Lift Station serves a small residential area in southeast McNary. The service area site is located such that significant additional growth cannot occur as the golf course borders the area to the north and McNary Industrial Park lies to east. Additionally, developable property to the south is topographically lower in elevation and, therefore, would not be served by the McNary Sewage Lift Station. The Wildwood Lane Sewage Lift Station has

enough capacity to handle wastewater from a significant amount of growth. The Wildwood Lift Station has capacity to handle about 576,000 gpd which equates to a service population of approximately 2,100.

WASTEWATER TREATMENT FACILITY EVALUATION

The Umatilla wastewater treatment plant was upgraded in 1978 when an "Activated Bio-Filter (ABF)" treatment works was constructed to replace a "package" contact-stabilization activated sludge facility. A Schematic Flow Diagram for the treatment plant is shown on Figure 4-2. Table 4-8 shows the treatment works currently in use.

The original design flow and loading for the treatment plant was used to specify the "package" ABF® design. Later, the over rating of such treatment facilities was recognized and the plant was derated. The original design capacity and the derated capacity are as follows:

Treatment Plant Loading Design Criteria

Parameter	Original Design Capacity	Derated Capacity	Anticipated Loadings
Average Flow, mgd	1.0	0.7	1.0
Maximum Flow, mgd	2.25		
Suspended Solids, ppd	1,836	1,284	2,310
BOD, ppd	1,877	1,314	2,750

Review of the capacity during this study by application of a biological treatment model indicates that the summer effluent BOD requirement of 20 mg/l and the winter requirement of 30 mg/l could be achieved at the derated capacity shown. However, based on the derated capacity as a maximum month limitation, average annual BOD loading would be limited to about 1,000 lb/day, approximately the existing loading, and well below the expected average annual loading from the City of Umatilla alone in 2020 (1,280 ppd). Additionally, the anticipated loadings including the Two Rivers Correction Facility and the Port of Umatilla Industrial Park would be approximately twice the capacity of the existing system.

The City's wastewater treatment plant is in need of major improvements, regardless of whether any growth occurs in the Umatilla service area. Several factors indicate improvements and upgrading are needed:

Age. The facilities were last upgraded 20 years ago (1977-78). Many of the components are now at the end of their expected life. Those components that are at the end of their life and are need of replacement or renovation include the following:

- Influent pump station - pumps are nearly worn out, pump and piping capacity is now deficient for future peak flows.
- Influent screens - corrosion and support deterioration make these facilities in need of complete replacement.

- Biological treatment tower - the media inside of the tower needs replacement in order to overcome progressive clogging and deterioration, which includes the media coming apart due to corrosion of fasteners.

- Clarifier mechanisms - corrosion and wear requires renovation or replacement.

Insufficient Capacity: The projected loads for the next 20 years, without considering the Two Rivers Correction Facility load, are greater than the existing facilities can adequately treat to meet the effluent discharge criteria:

- Influent pump station - inadequate capacity for projected flows.

- Influent screens - inadequate capacity for projected flows.

- Biological treatment tower - inadequate capacity to provide secondary treatment for projected loads.

- Activated sludge basins - inadequate size for future projected loads and inadequate aeration capacity for future projected loads.

- Clarifiers - inadequate size for projected loads.

- Recycle pumping capacity - clarifier return sludge pumps have inadequate capacity for projected loads; biological treatment tower pumps are adequate due to recent upgrade.

- Sludge digester and storage tanks - inadequate size for future sludge projections.

Changes in Regulations: Regulations for discharges to surface waters (Columbia River) and for disposal of sludge (Biosolids) have been changed since construction of the treatment facilities:

- Receiving water quality based regulations for dischargers require that toxic materials in discharges be limited - chlorine residual in the effluent is no longer allowable and either dechlorination facilities, or a change in disinfection method is required.

- Receiving water dilution - the outfall from the treatment plant is no longer adequate since it does not extend into the river far enough to assure consistent dilution year-round. The end of the outfall is exposed at low water.

- Sludge treatment - regulations for land application of sludge (biosolids) requires additional stabilization, and dewatering, if the solids are to be put to beneficial use.

- Testing - additional testing requirements necessitate more adequate laboratory facilities.

Other Inadequacies: The efficiency of the treatment plant and facilities can be enhanced by other improvements:

- Maintenance facilities - the existing maintenance facilities consist of a converted trailer. Current and anticipated workloads demand that more adequate facilities be provided to make the most effective use of operator time.

- Laboratory facilities – current lab facilities and equipment are small and inadequate for projected laboratory testing requirements to comply with the NPDES discharge permit.

- Grit removal facilities - there are currently no grit removal facilities in the treatment plant. Grit causes excessive wear on pumps, piping, mechanical equipment and other plant components.

- Sludge handling - sludge dewatering is needed to reduce the transportation time and cost for the waste sludge, whether they are transported to land application (soil amendment) or elsewhere for disposal.

COLUMBIA RIVER
BENTON COUNTY
UMATILLA COUNTY
McNARY DAM
LAKE WALLULA
VIEWPOINT
FISH LADDER
McNARY BEACH RECREATION AREA
SCALE: 1"=1200'
N
POND
POND
Pond
WILDLIFE
ST.
FISH VIEWING STATION
BOAT RAMP
UNION PACIFIC RR.
CO. RD. NO. 1279
PICNIC AREA
3RD
McNARY SUBSTATION
UNION PACIFIC RR
RIVERSIDE AVE.
DESCHUTES AVE.
KALAMA
DRAPER RD.
ACCESS RD.
McNARY BEACH
CLINE AVE.
HWY
SUBSTA
BROWNELL BLVD.
NO. 70
R.R.
DITCH
SHARPS CORNER
SPRAGUE ROAD
STANFIELD SAFETY REST AREA (WBND)
HERMISTON JUNCTION
NO. 2
(NOT IN CITY)
BROWNELL BLVD.
DRAPER ST.
SWAYZE RD
POWER CITY
MARGARET AVE
UMATILLA ROAD
CANAL
STANFIELD REST AREA (EBND)
RIVER
HWY.
TO COLD SPRINGS JCT.
Lateral
O.P.
BENDA DR.
EL MONTE ST.
JOHN DR.
POMONA DR.
COLUMBIA ST.
CHENOWETH AVE.
LAKE AVE.
DAY ST.
WILLAMETTE AVE.
UMATILLA AVE.
McNary
McNARY GOLF COURSE
KIKITAT ST.
YAKIMA ST.
WALLA WALLA ST.
KENNEWICK ST.
WENATCHEE ST.
COWLITZ ST.
PENDLETON AVE.
LEWIS ST.

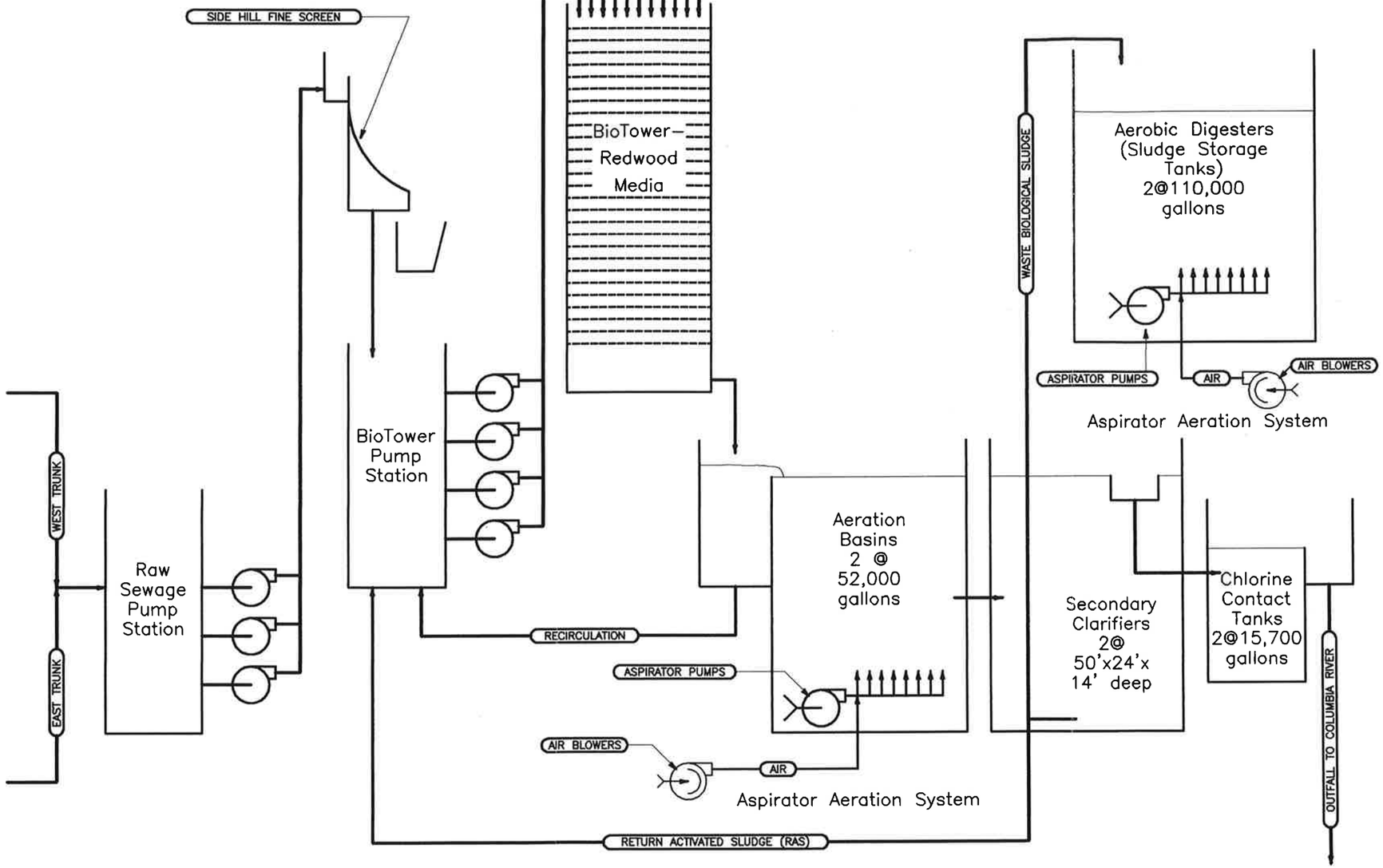
AREA LEGEND

R1-A1
MH
R1-A2
R1-A3
SR
R-3
CS
C

anderson perry & associates, inc.

CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
McNARY WASTEWATER
CONTRIBUTION AREAS

FIGURE
4-1



SCHEMATIC FLOW DIAGRAM – EXISTING TREATMENT PLANT

No Scale

ESVELT ENVIRONMENTAL ENGINEERING
7605 East Hodin Drive., Spokane, WA 99212

anderson perry & associates, inc.

CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
SCHEMATIC FLOW DIAGRAM
EXISTING TREATMENT PLANT

FIGURE
4-2

City of Umatilla
Southwest System
Peak Hour Flow Summary

	Scenario (mgd)	
Flow Component	**SW-1**	**SW-2**
Existing Downtown Umatilla Area Residential and Commercial	0.109	0.109
Existing Southwest Umatilla Area Residential and Commercial	0.265	0.265
Southwest Umatilla Area Residential and Commercial Growth	0.392	
Full Buildout of Undeveloped Southwest Umatilla Area Property		1.75
Total Peak Hour Flow	0.766	2.124

[1] **Growth and Flow Scenarios**

SW-1: Existing southwest and downtown Umatilla residential and commercial, and 50 percent of the projected 2020 increase in population.

SW-2: Existing southwest and downtown Umatilla residential and commercial and estimated full buildout of undeveloped southwest Umatilla area commercial and residential.

anderson perry & associates, inc.

CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
SOUTHWEST SYSTEM PEAK HOUR FLOW SUMMARY

TABLE 4-1

City of Umatilla
Southwest System Peak Hour Flow Accumulation (mgd)

SCENARIO SW-1 [1]

	Manhole				
Flow Component	**SW29**	**SW27**	**SW21**	**SW14**	**SW9**
Existing Downtown Umatilla Area Residential & Commercial					0.109
Existing Southwest Umatilla Area Residential		0.088	0.176	0.265	0.265
Southwest Umatilla Area Residential and Commercial Growth	0.392	0.392	0.392	0.392	0.392
Accumulated Flow (mgd)	0.392	0.480	0.568	0.657	0.766

SCENARIO SW-2 [1]

	Manhole				
Flow Component	**SW29**	**SW27**	**SW21**	**SW14**	**SW9**
Existing Downtown Umatilla Area Residential & Commercial					0.109
Existing Southwest Umatilla Area Residential		0.088	0.176	0.265	0.265
Full Buildout of Undeveloped Southwest Umatilla Areas	1.750	1.750	1.750	1.750	1.750
Accumulated Flow (mgd)	1.750	1.838	1.926	2.015	2.124

[1] **Growth and Flow Scenarios**

SW-1: Existing southwest and downtown Umatilla residential and commercial, and 50 percent of the projected 2020 increase in population.

SW-2: Existing southwest and downtown Umatilla residential and commercial and estimated full buildout of undeveloped southwest Umatilla area commercial and residential.

City of Umatilla
Southwest Interceptor
Comparison of Capacity to Peak Hour Flows

						Scenario (gpd)[1]	
Reach	Manhole Numbers	Grade (feet/feet)	Pipe Size (inches)	Sewer Capacity (Full Pipe) (gpd)	Sewer Capacity (2/3 Full Pipe) (gpd)	SH-1	SH-2
1	SW1-SW2	0.0023	12	1,103,867	827,901	766,000	2,124,000
2	SW2-SW3	0.0031	10	787,264	590,448	766,000	2,124,000
3	SW3-SW4	0.0033	10	812,263	609,197	766,000	2,124,000
4	SW4-SW5	0.0027	10	734,719	551,040	766,000	2,124,000
5	SW5-SW6	0.0026	10	720,985	540,739	766,000	2,124,000
6	SW6-SW7	0.0027	10	734,719	551,040	766,000	2,124,000
7	SW7-SW8	0.0015	10	547,628	410,721	766,000	2,124,000
8	SW8-SW9	0.0029	10	761,445	571,084	766,000	2,124,000
9	SW9-SW10	0.0083	10	1,288,186	966,140	766,000	2,124,000
10	SW10-SW11	0.0047	8	535,925	401,944	657,000	2,015,000
11	SW11-SW12	0.0084	8	716,465	537,349	657,000	2,015,000
12	SW12-SW13	0.0090	8	741,612	556,209	657,000	2,015,000
13	SW13-SW14	4-INCH FORCEMAIN					
14	SW14-SW15	0.0167	8	1,010,214	757,661	568,000	1,926,000
15	SW15-SW16	0.0533	8	1,804,757	1,353,568	568,000	1,926,000
16	SW16-SW17	0.0618	8	1,943,343	1,457,507	568,000	1,926,000
17	SW17-SW18	0.0332	8	1,424,375	1,068,281	568,000	1,926,000
18	SW18-SW19	0.0500	8	1,747,995	1,310,996	568,000	1,926,000
19	SW19-SW20	0.0500	8	1,747,995	1,310,996	568,000	1,926,000
20	SW20-SW21	0.0800	8	2,211,058	1,658,294	568,000	1,926,000
21	SW21-SW22	0.0784	8	2,188,836	1,641,627	480,000	1,838,000
22	SW22-SW23	0.0257	8	1,253,204	939,903	480,000	1,838,000
23	SW23-SW24	0.0490	8	1,730,427	1,297,820	480,000	1,838,000
24	SW24-SW25	0.0480	8	1,712,678	1,284,509	480,000	1,838,000
25	SW25-SW26	0.0050	8	552,765	414,573	480,000	1,838,000
26	SW26-SW27	0.0600	8	1,914,833	1,436,125	480,000	1,838,000
27	SW27-SW28	0.0540	8	1,816,570	1,362,427	392,000	1,750,000
28	SW28-SW29	0.0300	8	1,353,991	1,015,493	392,000	1,750,000

City of Umatilla
Peak Hour Flow Estimates From Full Buildout of McNary Industrial Park and Undeveloped Commercial and Residental Areas

McNary Area Undeveloped Residential and Commercial					McNary Industrial Park	
Wastewater Contribution Area	Total Contributing Area (acres)	Percent Undeveloped[1]	Undeveloped Area (acres)	Peak Hour Flow (gpd)	Source	Peak Hour Flow (mgd)
R1-A1	59	20	12	37,800	Two Rivers Correctional Institute	1.152
R1-A2	96	40	38	123,000	Industrial	0.560
R1-A3	79	90	71	216,000		
R3	23	90	21	198,000		
C	47	60	28	21,600		
MH	33	10	3	13,000		
CS	27	100	27	51,300		
SR	130	100	130	86,000		

[1] Percent undeveloped based upon November 18, 1994 aerial photographs.

City of Umatilla
McNary System
Peak Hour Flow Component Summary

	Scenario (mgd)				
Flow Component	**M-1**	**M-2**	**M-3**	**M-4**	**M-5**
Existing McNary Area Residential and Commercial	0.312	0.312	0.312	0.312	0.312
Existing Southeast Umatilla Area Residential and Commercial	0.149	0.149	0.149	0.149	0.149
Existing McNary Industrial Park	0.055	0.055	0.055	0.055	0.055
McNary Area Residential and Commercial Growth		0.392			
Full Buildout of McNary Area Undeveloped Residential and Commercial			0.747		
Full Buildout of McNary Industrial Park					0.480
Two Rivers Correctional Institute				1.152	
Total Peak Hour Flow	0.516	0.908	1.263	1.668	0.996

[1] Growth and Flow Scenarios

M-1: Existing McNary and east Umatilla residential and commercial, and existing McNary Industrial Park.

M-2: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park and 50 percent of the projected 2020 population increase.

M-3: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and full buildout of undeveloped McNary area commercial and residential property.

M-4: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and Two Rivers Correctional Institute.

M-5: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and full buildout of McNary Industrial Park.

City of Umatilla
McNary System
Peak Hour Flow Accumulation (mgd)

SCENARIO M-1 [1]

	Manhole					
Flow Component	**M64**	**M59**	**M46**	**M32**	**M18**	**M3**
Existing McNary Residential & Commercial			0.156	0.312	0.312	0.312
Existing Southeast Umatilla Residential & Commercial						0.149
Existing McNary Industrial Park	0.0275	0.055	0.055	0.055	0.055	0.055
Accumulated Flow (mgd)	0.0275	0.055	0.211	0.367	0.367	0.516

SCENARIO M-2 [1]

	Manhole					
Flow Component	**M64**	**M59**	**M46**	**M32**	**M18**	**M3**
Existing McNary Residential & Commercial			0.156	0.312	0.312	0.312
Existing Southeast Umatilla Residential & Commercial						0.149
Existing McNary Industrial Park	0.0275	0.055	0.055	0.055	0.055	0.055
McNary Area Residential and Commercial Growth			0.196	0.392	0.392	0.392
Accumulated Flow (mgd)	0.0275	0.055	0.407	0.759	0.759	0.908

SCENARIO M-3 [1]

	Manhole							
Flow Component	**M64**	**M59**	**M55**	**M46**	**M39**	**M32**	**M18**	**M3**
Existing McNary Residential & Commercial				0.156	0.156	0.312	0.312	0.312
Existing Southeast Umatilla Residential & Commercial								0.149
Existing McNary Industrial Park	0.0275	0.055	0.055	0.055	0.055	0.055	0.055	0.055
Full Buildout of McNary Area Undeveloped Residential and Commercial Sectors				0.149	0.298	0.748	0.748	0.748
Accumulated Flow (mgd)	0.0275	0.055	0.055	0.360	0.509	1.115	1.115	1.264

SCENARIO M-4 [1]

	Manhole						
Flow Component	**M64**	**M59**	**M55**	**M46**	**M32**	**M18**	**M3**
Existing McNary Residential & Commercial				0.156	0.312	0.312	0.312
Existing Southeast Umatilla Residential & Commercial							0.149
Existing McNary Industrial Park	0.0275	0.055	0.055	0.055	0.055	0.055	0.055
Two Rivers Correctional Institute	1.152	1.152	1.152	1.152	1.152	1.152	1.152
Accumulated Flow (mgd)	1.1795	1.207	1.207	1.363	1.519	1.519	1.668

SCENARIO M-5 [1]

	Manhole						
Flow Component	**M64**	**M59**	**M55**	**M46**	**M32**	**M18**	**M3**
Existing McNary Residential & Commercial				0.156	0.312	0.312	0.312
Existing Southeast Umatilla Residential & Commercial							0.149
Existing McNary Industrial Park	0.0275	0.055	0.055	0.055	0.055	0.055	0.055
Full Buildout of McNary Industrial Park	0.16	0.32	0.48	0.48	0.48	0.48	0.48
Accumulated Flow (mgd)	0.1875	0.375	0.535	0.691	0.847	0.847	0.996

[1] **Growth and Flow Scenarios**

M-1: Existing McNary and east Umatilla residential and commercial, and existing McNary Industrial Park.
M-2: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park and 50 percent of the projected 2020 population increase.
M-3: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, full buildout of undeveloped McNary area commercial and residential property.
M-4: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and Two Rivers Correctional Institute.
M-5: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and full buildout of McNary Industrial Park.

City of Umatilla
McNary Interceptor
Comparison of Capacity to Peak Hour Wastewater Flows

						Growth and Flow Scenario (gpd)[1]				
Reach	Manhole Numbers	Grade (feet/feet)	Pipe Size (inches)	Sewer Capacity (Full Pipe) (gpd)	Sewer Capacity (2/3 Full Pipe) (gpd)	M-1	M-2	M-3	M-4	M-5
1	M1-M2	0.0024	12	1,127,609	845,707	516,000	908,000	1,264,000	1,668,000	996,000
2	M2-M3	0.0022	12	1,079,604	809,703	516,000	908,000	1,264,000	1,668,000	996,000
3	M3-M4	0.0076	12	2,006,595	1,504,946	367,000	759,000	1,115,000	1,519,000	847,000
4	M4-M5	0.0057	12	1,737,762	1,303,322	367,000	759,000	1,115,000	1,519,000	847,000
5	M5-M6	0.0056	12	1,722,451	1,291,839	367,000	759,000	1,115,000	1,519,000	847,000
6	M6-M7	0.0038	12	1,418,877	1,064,158	367,000	759,000	1,115,000	1,519,000	847,000
7	M7-M8	0.0023	12	1,103,867	827,901	367,000	759,000	1,115,000	1,519,000	847,000
8	M8-M9	0.0022	12	1,079,604	809,703	367,000	759,000	1,115,000	1,519,000	847,000
9	M9-M10	0.0085	12	2,122,083	1,591,563	367,000	759,000	1,115,000	1,519,000	847,000
10	M10-M11	0.0090	12	2,183,606	1,637,704	367,000	759,000	1,115,000	1,519,000	847,000
11	M11-M12	0.0022	12	1,079,604	809,703	367,000	759,000	1,115,000	1,519,000	847,000
12	M12-M13	0.049	12	5,095,080	3,821,310	367,000	759,000	1,115,000	1,519,000	847,000
13	M13-M14	0.0022	12	1,079,604	809,703	367,000	759,000	1,115,000	1,519,000	847,000
14	M14-M15	0.0022	12	1,079,604	809,703	367,000	759,000	1,115,000	1,519,000	847,000
15	M15-M16	0.0022	12	1,079,604	809,703	367,000	759,000	1,115,000	1,519,000	847,000
16	M16-M17	0.0036	12	1,381,034	1,035,775	367,000	759,000	1,115,000	1,519,000	847,000
17	M17-M18	0.0025	12	1,157,611	868,208	367,000	759,000	1,115,000	1,519,000	847,000
18	M18-M19	0.0025	12	1,144,071	858,054	367,000	759,000	1,115,000	1,519,000	847,000
19	M19-M20	0.0022	12	1,091,803	818,852	367,000	759,000	1,115,000	1,519,000	847,000
20	M20-M21	0.0036	12	1,386,376	1,039,782	367,000	759,000	1,115,000	1,519,000	847,000
21	M21-M22	0.0155	12	2,864,063	2,148,047	367,000	759,000	1,115,000	1,519,000	847,000
22	M22-M23	0.0027	12	1,197,854	898,391	367,000	759,000	1,115,000	1,519,000	847,000
23	M23-M24	0.0381	12	4,489,834	3,367,376	367,000	759,000	1,115,000	1,519,000	847,000
24	M24-M25	0.0503	12	5,161,850	3,871,388	367,000	759,000	1,115,000	1,519,000	847,000
25	M25-M26	0.0037	12	1,393,050	1,044,788	367,000	759,000	1,115,000	1,519,000	847,000
26	M26-M27	0.0031	12	1,281,545	961,159	367,000	759,000	1,115,000	1,519,000	847,000
27	M27-M28	0.0155	12	2,865,622	2,149,216	367,000	759,000	1,115,000	1,519,000	847,000
28	M28-M29	0.0218	12	3,398,453	2,548,840	367,000	759,000	1,115,000	1,519,000	847,000
29	M29-M30	0.0054	12	1,687,930	1,265,947	367,000	759,000	1,115,000	1,519,000	847,000
30	M30-M31	0.0052	12	1,663,817	1,247,863	367,000	759,000	1,115,000	1,519,000	847,000
31	M31-M32	0.0038	12	1,420,411	1,065,308	367,000	759,000	1,115,000	1,519,000	847,000
32	M32-M33	0.0018	12	966,240	724,680	211,000	407,000	509,000	1,363,000	691,000
33	M33-M34	0.0204	12	3,289,819	2,467,364	211,000	407,000	509,000	1,363,000	691,000
34	M34-M35	0.0038	12	1,417,320	1,062,990	211,000	407,000	509,000	1,363,000	691,000
35	M35-M36	0.0036	12	1,387,077	1,040,308	211,000	407,000	509,000	1,363,000	691,000
36	M36-M37	0.0040	12	1,455,737	1,091,803	211,000	407,000	509,000	1,363,000	691,000
37	M37-M38	0.0031	12	1,272,325	954,244	211,000	407,000	509,000	1,363,000	691,000
38	M38-M39	0.0038	12	1,426,716	1,070,037	211,000	407,000	509,000	1,363,000	691,000
39	M39-M40	0.0033	12	1,325,655	994,241	211,000	407,000	360,000	1,363,000	535,000
40	M40-M41	0.0031	12	1,288,787	966,590	211,000	407,000	360,000	1,363,000	535,000
41	M41-M42	0.0036	12	1,387,077	1,040,308	211,000	407,000	360,000	1,363,000	535,000
42	M42-M43	0.0038	12	1,416,208	1,062,156	211,000	407,000	360,000	1,363,000	535,000
43	M43-M44	0.0034	12	1,347,358	1,010,518	211,000	407,000	360,000	1,363,000	535,000

44	M44-M45	0.0048	12	1,586,353	1,189,765	211,000	407,000	360,000	1,363,000	535,000
45	M45-M46	0.0033	12	1,328,900	996,675	211,000	407,000	360,000	1,363,000	535,000
46	M46-M47	0.0020	12	1,026,160	769,620	55,000	55,000	55,000	1,207,000	375,000
47	M47-M48	0.0045	12	1,547,879	1,160,909	55,000	55,000	55,000	1,207,000	375,000
48	M48-M49	0.0036	12	1,377,833	1,033,375	55,000	55,000	55,000	1,207,000	375,000
49	M49-M50	0.0036	12	1,381,833	1,036,374	55,000	55,000	55,000	1,207,000	375,000
50	M50-M51	0.0022	12	1,079,604	809,703	55,000	55,000	55,000	1,207,000	375,000
51	M51-M52	0.0022	12	1,079,604	809,703	55,000	55,000	55,000	1,207,000	375,000
52	M51-M53	0.0022	12	1,079,604	809,703	55,000	55,000	55,000	1,207,000	375,000
53	M53-M54	0.0022	12	1,079,604	809,703	55,000	55,000	55,000	1,207,000	375,000
54	M54-M55	0.0060	12	1,782,907	1,337,180	55,000	55,000	55,000	1,207,000	375,000
55	M55-M56	0.0025	12	1,150,861	863,146	55,000	55,000	55,000	1,207,000	375,000
56	M56-M57	0.0025	12	1,150,861	863,146	55,000	55,000	55,000	1,207,000	375,000
57	M57-M58	0.0025	12	1,150,861	863,146	55,000	55,000	55,000	1,207,000	375,000
58	M58-M59	0.0025	12	1,150,861	863,146	55,000	55,000	55,000	1,207,000	375,000
59	M59-M60	0.0025	12	1,150,861	863,146	27,500	27,500	27,500	1,179,500	187,500
60	M60-M61	0.0025	12	1,150,861	863,146	27,500	27,500	27,500	1,179,500	187,500
61	M61-M62	0.0025	12	1,150,861	863,146	27,500	27,500	27,500	1,179,500	187,500
62	M62-M63	0.0025	12	1,150,861	863,146	27,500	27,500	27,500	1,179,500	187,500
63	M63-M64	0.0025	12	1,150,861	863,146	27,500	27,500	27,500	1,179,500	187,500

[1] **Growth and Flow Scenarios**

M-1: Existing McNary and east Umatilla residential and commercial, and existing McNary Industrial Park (not including Gilroy Foods).

M-2: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park (not including Gilroy Foods), and 50 percent of the projected 2020 population increase.

M-3: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and full buildout of undeveloped McNary area commercial and residential property.

M-4: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and Two Rivers Correctional Institute.

M-5: Existing McNary and east Umatilla residential and commercial, existing McNary Industrial Park, and full buildout of McNary Industrial Park.

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY

EXISTING WASTEWATER TREATMENT FACILITY

Component	Number and Size	Capacity
Raw Sewage Pump Station	3 Pumps - 700 gpm each	1,400 gpm w/ one OTS
Raw Sewage Screens	1 – 72" Side Hill Fine Screen	990 gpm for 0.030 openings
Bio-Tower (Activated Bio-Cell)	1 – 24' x 24' x 14' deep Redwood Slat Media	1,560 gpm flow distribution capacity
Aeration Basins	2 – 24'7" x 14'4" x 10' deep Aspirator Aerators	52,000 gallons each
Secondary Clarifiers	2 – 50' x 24' x 8' deep	1,200 sq. ft. area each
Chlorine Contact Tanks	2 – 150' x 3.5' x 4.0' deep	15,700 gallons each
Aerobic Digesters	2 – 52' x 24.5' x 11.5' deep	110,000 gallons each
Outfall to Columbia River	16" DI Pipe	

CHAPTER 5

IMPROVEMENT ALTERNATIVES

This section of the Wastewater System Study presents improvement alternatives for the collection, treatment, and discharge facilities in order to meet the 20-year design criteria and to address system deficiencies described within Chapter 4. Included with each alternative is a cost estimate and a discussion of the pros and cons of the alternative. The improvement alternatives, associated cost estimates, and alternative evaluations given in this section will be used to develop the selected improvements to be shown in Chapter 6.

COLLECTION SYSTEM IMPROVEMENT ALTERNATIVES

Introduction. The collection system improvement alternatives provided in this section are for the Southwest interceptor and McNary interceptor systems. Figure 5-1 shows the location of the Southwest interceptor and Figure 5-2 shows the location of the McNary interceptor. The improvement alternatives for the Southwest interceptor will be presented followed by the McNary interceptor improvement alternatives.

Southwest System. Two growth and flow scenarios were presented in Chapter 4 for purposes of evaluating the capacity of the Southwest interceptor. Based upon the results of the capacity evaluation presented in Chapter 4, sections of the Southwest interceptor do not have enough capacity to handle the anticipated peak hour flows from residential and commercial development resulting from the projected 2020 population increase (Scenario SH-1). The interceptor does, however, have enough capacity in all of the reaches that collect wastewater from developments in southwest Umatilla (from manhole SH-14 upstream to the end of the interceptor (SH29)) to handle the anticipated Scenario SH-1 peak flows . Flows resulting from Scenario SH-2, however, will overload the interceptor in most of the reaches. Based upon the results of the evaluation, three alternatives are available to the City.

1. Referring to Figure 5-1, upgrade the Southwest Sewage Lift Station now as part of the overall wasterwater system improvements project and improve the capacity of the interceptor in the future on an as needed basis using system development charges or some other funding source to pay for the improvements, and;

2. Upgrade the Southwest Sewage Lift Station and forcemain and improve the capacity of the interceptor from manhole SH-13 downstream to the treatment plant (section of the interceptor east of the Umatilla River) now as part of the overall wastewater system improvements project and improve the capacity of the section of the interceptor from manhole SH-14 upstream to SH-29 on an as needed basis.

3. No action, do not perform the Southwest Sewage Lift Station, Forcemain, and Interceptor Improvements.

Alternative 1 relies on the City being able to fund improvements to the collection system on an as needed basis. As sections of the system reach capacity, improvements would be completed. One of the disadvantages of Alternative 1 is that it requires frequent reevaulation to determine available capacity remaining and when replacement is needed. An advantage of Alternative 1 is that the necessity of improvements are not based upon projected growth, but rather on growth that has been fully realized.

Under Alternative 2, impovements to the Southwest interceptor would be completed as part of the overall wastewater system improvements project. The major advantage of Alternative 2 is that the cost of these improvements is relatively minor compared to the overall cost of the wastewater system improvements project, and would most likely cost significantly more if the alternative was constructed in stages at a later date. With the improvements in place, the Southwest interceptor would have enough capacity to meet the needs of the anticipated growth in this area of the community prior to capacity problems occurring due to unforeseen acceleration of growth. For this reason, the most feasible and preferred alternative available to the City is Alternative 2. It is recommended that the City complete the improvements to the Southwest interceptor, as part of the overall wastewater system upgrade, as outlined above. A plan of the proposed Southwest system improvements is shown on Figure 5-1, and estimated costs to provide the improvements are presented on Table 5-1.

Since the existing sewage lift station is at capacity with Alternative 3 - *No Action*, a moratorium on new services in the area would be required. With the anticipated growth expected in Umatilla, and Southwest Umatilla being the most viable area for growth, this alternative would be postponement of the inevitable.

McNary System. Five scenarios were presented, in Chapter 4, to evaluate the capacity of the McNary interceptor. Based upon the evaluation, the existing McNary interceptor has enough hydraulic capacity to handle the exisiting peak hour flows from residential, commercial, and industrial sources (excluding Gilroy Foods) and the anticipated peak hour flows resulting from full build-out of the undeveloped residential and commercial sectors. The McNary interceptor, however, does not have enough capacity to handle peak flows from existing residential, commercial and industrial sectors, anticipated flows resulting from projected residential and commercial growth in the McNary area, flows resulting from build-out of the McNary Industrial Park and the projected flows from Two Rivers Correctional Institute. The City has two alternatives available to provide the necessary capacity to serve all of the wastewater contributors in the McNary area. An additional alternative is the "No Action" alternative.

1. Replace the existing McNary interceptor with a pipe large enough to provide the required capacity to handle projected peak flows from residential, commercial, industrial and Two Rivers Correctional Institute, and;

2. Use the existing McNary interceptor for residential and commercial sectors only, and construct a separate dedicated interceptor to serve the McNary Industrial Park and Two Rivers Correctional Institute.

3. No action, which would mean not performing the improvements to the McNary system.

Replacing the existing McNary interceptor would require abandonment of the existing line and construction of a large pipe along the same route. The major disadvantages of Alternative 1 include disruption of sewer service to residential and commercial users during the construction phases, the relatively large piping, and associated higher construction costs that would be needed in order to provide the required capacity. The advantage is that the City would only have one interceptor to maintain.

Alternative 2 would provide a separate interceptor to serve the McNary Industrial Park and Two Rivers Correctional Institute (subsequently referred to as the McNary Industrial Park Interceptor). Approximately 17,600 feet of 18-inch line would be constructed from manhole M59 and would run westerly on the north side of McNary and Umatilla to the wastewater treatment plant. As shown on Table 4-7 under Scenario M-4, the existing McNary Interceptor does not have adequate capacity from manholes M-64 to M59 to handle the anticipated flows from TRCI. As a result, in order to serve the TRCI, the existing interceptor between manholes M-59 and M-64 will need to be improved. In addition, the interceptor will need to be extended east from manhole M-64 for approximately 1,200 feet. Approximately 3,000 feet of 15-inch line would be needed to complete the improvements (refer to Figure 5-2). In order to serve the entire McNary Industrial Park, a sewage lift station located in the vicinity of Draper Road and the southeast corner of the McNary Golf Course would be needed. The McNary Industrial Park Sewage Lift Station would pump wastewater collected from the park through 2,200 feet of 8-inch forcemain located along the west side of Draper Road and discharge it into manhole M59.

Alternative 3, No Action, is not feasible since the Two Rivers Correctional Institute will be built whether or not the needed improvements are constructed. As shown in the hydraulic analysis, the flow from this institution would surcharge the existing McNary Interceptor.

From a construction logistics and cost standpoint, Alternative 2 is the most feasible alternative available to the City. It is recommended that the City construct a new separate dedicated interceptor line and lift station to serve the McNary Industrial Park and TRCI. A cost estimate to complete the McNary interceptor improvements is presented on Table 5-2. Table 5-3 provides a cost estimate for the McNary Industrial Park Lift Station and Forcemain Improvements.

TREATMENT FACILITY IMPROVEMENT ALTERNATIVES

It was shown in Chapter 4 that the treatment plant is not currently of adequate capacity to treat expected flows and loadings. Evaluation of the existing treatment

facilities, using a biological treatment model calibrated with data from this and other similar treatment facilities, indicates that the existing treatment plant could not meet secondary treatment requirements at the projected design loads, even without adding the load from the Two Rivers Correctional Facility, or expansion at the Port of Umatilla Industrial Park. Upgrade of the facilities would be required, including increasing the biotower capacity, aeration volume and capacity, or both, and improvement of other plant components.

Three alternative treatment systems are considered for construction by the City of Umatilla to meet effluent requirements and to provide a reliable and long-life treatment facility. Additionally, a no effluent discharge to surface waters alternative (seasonal effluent storage and land application system) is presented. Criteria for the treatment systems includes the following:

1. Design to meet the expected loads through the year 2020, ***excluding the Port of Umatilla Industrial Park design flows and loadings***, as shown in Chapter 3.

2. Class II reliability. This means that all mechanical components (pumps, aerators, sedimentation basins, disinfection equipment) would have backup to allow operation with the largest single component out of service, and that two units of each treatment component would be provided so that at least 50% capacity would remain with the largest unit out of service (this requirement can be met by providing duplicate aerators in a single aeration basin).

3. Operator friendliness to minimize the number of operators necessary to operate the facility.

4. Production of an effluent which meets the requirements of the Oregon Department of Environmental Quality (DEQ) for secondary treatment. This is interpreted as meeting the Effluent Criteria shown in Chapter 3 for biochemical oxygen demand (BOD), total suspended solids (TSS), and fecal coliform or ***E. coli*** bacteria.

5. For surface water discharge option, the treated effluent is to be discharged to the Columbia River via an outfall submerged at all times and which will provide adequate dilution for the effluent.

6. Sludge treated to meet Class B biosolids criteria, as a minimum, dewatered for ease of handling.

Biological Treatment Alternatives. The three alternatives evaluated for providing biological treatment to meet effluent requirements consist of the following:

1. **Upgrade Existing Treatment Plant Biological Treatment Facilities**. Analysis indicates that the existing treatment plant can be upgraded to provide secondary treatment to the projected waste flow at the projected

loadings by increasing the aeration basin volume and capacity, addition of clarifier capacity, and upgrading other treatment components. (Refer to Figure 5-3.) Modifications would consist of replacing the media in the biotower, converting the existing aerobic digesters to aeration basins, providing additional aeration, construction of a new clarifier to supplement the existing clarifiers, and construction of new sludge digestion facilities. Other improvements, as discussed below, would also be provided.

2. **Replace Existing Biological Treatment with Oxidation Ditch Activated Sludge Treatment**. Refer to Figure 5-4. The system evaluated is based on oxidation ditch configured aeration basins using vertical turbine aerators. This type of aeration provides an intensive aeration and mixing zone and provides for continuous velocity in the oxidation ditch to maintain the biological solids in suspension. This system has low operator demands and low power consumption. It has been demonstrated to produce an effluent meeting secondary treatment criteria and is relatively simple construction, which allows for low cost. Reliability would be provided with multiple aerators, but only one aeration basin would be provided.

3. **Replace Existing Biological Treatment with Sequencing Batch Reactor Activated Sludge**. Refer to Figure 5-5. This alternative uses batch aeration in more than one basin, operated in parallel. The wastewater flows into only a single basin at a time. After wastewater flows into the basin for a preset time period the basin contents are aerated, the aerators are shut off to allow settling, and the clear treated effluent withdrawn, or decanted, prior to additional untreated wastewater flowing into the basin. Wastewater flow goes to the basins one at a time (sequential operation). This system operates at approximately the same biological rate as the oxidation ditch system. It has been demonstrated to be able to provide an effluent quality meeting the requirements shown in Chapter 3. A disadvantage is that the discharge from the reactors is at a high flow rate over a short-time duration, creating peaks in the effluent flow rate, which require equalization ahead of disinfection.

The evaluation of these alternatives will be for systems designed for biological treatment to meet secondary treatment criteria, removal of BOD and TSS, as shown in Chapter 3. They would not, however, be capable of consistently removing total nitrogen or phosphorus by biological means. Each of the alternatives would require additional size or additional components to be capable of biological phosphorous and/or nitrogen removal, should this become a future requirement.

Other Treatment Components. Each of the three biological process alternatives will be capable of meeting the effluent requirements. The Umatilla treatment plant must also have facilities for influent pretreatment to remove grit and debris, an upgraded pumping station to meet the new design flows, effluent disinfection improvements, and facilities for sludge handling. In addition, improvements in operating facilities, such as the

laboratory, maintenance area, and in safety provisions will be necessary to have a complete and modern treatment system. Specific treatment components that must be included under all of the alternatives, in addition to the biological treatment process, include the following:

1. **Raw Sewage Pumping Station Improvements**. The capacity of the pumping station must be increased. This would entail either a new pump station facility, or upgrade of the existing facility to meet the new requirements. The pump station capacity, in order to meet the requirements, must be 3.2 mgd, the predicted maximum flow, with the largest pump out of service to meet the reliability requirements (this requirement would be the same regardless of class of reliability).

2. **Preliminary Treatment Improvements**. Removal of grit and debris are essential to protect treatment equipment from excessive wear and plugging. The existing system does not have capacity for the new design flows and requirements and, therefore, a new or upgraded grit removal system and new and increased capacity for fine screening must be added. Overall, the needed preliminary treatment components include mechanical screening, flowmetering, and fine screening.

3. **Disinfection System Improvements**. The existing chlorine contact tank appears to be adequate for future criteria and the existing chlorination system appears to be adequate. Dechlorination by addition of sulfur dioxide (SO_2) would be required to remove the chlorine residual and reduce chlorine-induced toxicity in the effluent to the Columbia River. Retention of the chlorine disinfection system would also require bringing the facilities up to the new toxic gas spill provisions of the Uniform Fire Code. This would add significant costs and, with consideration of long-term requirements, appears that changing the disinfection to a new ultra-violet light (UV) system is justified. A new UV disinfection system could be installed in the existing chlorine contact tanks.

4. **Outfall Extension**. Except for the no discharge to surface waters, the existing outfall needs to be extended to provide approximately three feet of additional water depth above the outfall outlet, and to move the discharge point further out into the Columbia River. When the John Day Pool is operated between 264 and 265 feet above mean sea level, the current"normal" operating range, treated wastewater is discharged near the water surface in a poorly-circulated area adjacent to the south shoreline. These conditions do not facilitate effluent/river mixing required by the City's NPDES Permit.

   The outfall will be extended approximately 250 feet along the river bottom to gain additional water coverage and to place the outlet into and area exhibiting more aggressive flow conditions. Additional water coverage will

provide a greater mixing depth to counteract the buoyant characteristics of treated municipal wastewater. An extension further out into the river will expose the discharge to higher river velocities and shear, thereby increasing the rate of turbulent mixing. The configuration of the outfall port system (i.e. number of ports, port orientation) will be evaluated during design to ensure adequate mixing is provided.

This outfall extension strategy will provide sufficient mixing under the current river level operating range. If the John Day Pool is lowered in the future as part of salmon recovery efforts, mixing characteristics in the vicinity of the proposed outfall may change. If the pool level is lowered substantially, another outfall extension on the order of 1,000 feet may be necessary to ensure adequate mixing. However, the Corps of Engineers has indicated that any potential drawdown is unlikely to occur within the next 10 years, and the magnitude of the drawdown cannot be predicted at this time. Corps of Engineers officials have advised against a major outfall extension project at this time due to uncertainties in the future John Day Pool operating strategy and the potential for river bottom disturbance if the outfall were carried over to the main river channel.

5. **Sludge Processing**. Sludge from each of the biological treatment alternatives discussed would be primarily biological in nature and would be wasted from the biological system at a concentration of 1 percent dry solids (1% DS), or less. Further processing of the sludge is inefficient at this low concentration and, therefore, provisions for sludge thickening by gravity belt thickener or improvements of provisions for decanting from the aerobic digestion tanks would be required.

Sludge processing to meet requirements for Class B biosolids quality as defined by Federal Regulations 40 CFR 503 to allow disposal on agricultural land (non-food crops) is needed. Aerobic digestion as currently used at the plant is only marginally capable of sludge treatment to this level, but it is included with each of the alternatives evaluated. The aerobic digestion tanks will provide storage capability to allow for inability to remove sludge from the site during some seasonal weather conditions. The capacity of the existing aerobic digestion tanks is inadequate for future treatment plant loadings, and it is proposed to convert the treatment tanks from the old "contact-stabilization" plant for additional capacity.

Sludge dewatering is needed in order to provide efficient handling of the waste sludge (biosolids). It is proposed to include belt filter press dewatering capability to achieve dewatered sludge concentrations of 16% DS or more. This would allow efficient transport of the solids for land application, or to a commercial composting facility, such as the facility proposed for construction near Stanfield by Columbia Humus.

6. **Yard and Process Piping**. Yard and process piping improvements will be required in order to transport sewage from the new influent pump station to the pretreatment area (screening and grit removal), to the new biological treatment facility, from the aeration tank to the clarifiers, to the disinfection facilities, and to the effluent outfall into the Columbia River. Piping would also be needed for sludge recirculation from the clarifiers to the aeration basin and for waste sludge transport to the sludge treatment components.

7. **Electrical System**. A new electrical system may be required, as it appears that some components of the existing electrical system do not meet current codes and are of an age that replacement parts are not available and additional units cannot be acquired for upgrade. Existing facilities which will remain in operation would be powered from the new system.

8. **Instrumentation and Control System**. A new instrumentation and control system is needed to provide accurate metering and monitoring of the existing and new facilities. A computer-based distributed instrumentation and control system is included for each of the alternatives evaluated, in order to reduce operator time and requirements.

9. **Site Work, Demolition and Rehabilitation**. Inclusion of site work to accommodate the new facility, with some demolition to allow construction of new and improved facilities, and rehabilitation of the site for ease of future maintenance are required with each alternative. The costs developed for the alternatives do not include complete demolition of existing structures which are not utilized or not in need of upgrade.

10. **New Laboratory and Operations Building**. The current laboratory facilities and administrative area are inadequate and in need of improvement or replacement. A new laboratory operations building is included in the evaluation of each of the alternatives.

11. **New Maintenance Building**. A new building for maintenance of equipment, spare parts storage, and vehicle storage is needed to make operations more efficient.

12. **Sludge Hauling and Spreading Truck**. A truck for hauling and spreading the dewatered sludge is needed for transporting sludge from the site to a field for disposal, or to the planned composting plant in Stanfield.

Other Potential Improvements Not Included in Analysis. Items which are not included in the analysis of alternatives and cost comparison, which may be desirable or may be required under some circumstances, include the following:

1. **Complete Demolition of Abandoned Existing Facilities**. It would be desirable to demolish all the existing facilities which are not utilized in the

expanded system. However, the cost for this complete demolition is not currently included in the alternative analysis.

2. **Land For Sludge Disposal**. If land for disposal of biosolids cannot be arranged with private parties, and if an alternative disposal provision (i.e. disposal by private contractor such as Columbia Humus) is not available, it may be necessary for the City to purchase or lease property for land disposal of sludge.

3. **Port of Umatilla Flows**. The additional capacity for treating the design flows for the Port of Umatilla, shown in Chapter 3, may be required if funding for that capacity becomes available.

EVALUATION OF ALTERNATIVES

The three alternatives for upgrading the Umatilla wastewater treatment plant were listed above as 1) upgrading the existing facilities; 2) an oxidation ditch activated sludge treatment system; and 3) batch activated sludge system (sequencing batch reactor, or SBR). The differences between the alternatives were only in the biological treatment system portion of the evaluated systems. Each of the biological treatment systems is designed to treat the maximum month flow and BOD load and to be able to treat the maximum day BOD load without upset or anaerobic conditions in the biological treatment. Each of the biological treatment systems is designed to produce an effluent with BOD and TSS at 20 mg/l or less during summer operation, and 30 mg/l during winter operation (see requirements in Chapter 3). Influent pump station, preliminary treatment facilities (metering, grit removal, screening), disinfection system, sludge processing, and other improvements such as yard piping, electrical, and instrumentation and control, extension of the outfall, and new lab and maintenance facilities are common to all three alternatives. The costs of some of these improvements are estimated as proportional to the cost of other items and, therefore, are sensitive to the cost of the biological facilities.

Alternative No. 1 - Upgrade Existing Wastewater Treatment Plant

The existing aerobic digesters would be converted to aeration basins. One new circular 45-foot diameter clarifier would be constructed to provide additional clarification capacity. The biotower media would be replaced. Disinfection would be improved by installation of ultra-violet light (UV) disinfection equipment. Added capacity for sludge storage (aerobic digestion) would be required to replace the tanks converted to aeration basins, and to provide additional capacity for increased loads. System components are shown on Table 5-4. The estimated construction cost for upgrading the existing wastewater treatment plant is shown on Table 5-5, and a schematic Flow Diagram for the improved facilities is shown on Figure 5-3. Most assumptions surrounding the alternative are shown on the table, which describes the items for inclusion in the alternative and Engineer's opinion of costs by items. Costs for preliminary treatment, the biological treatment facility, sludge processing, and the new lab and operations building are broken down into smaller categories to indicate the value of each of the items.

Facilities would be designed for Class II reliability which provides pumping capacity for the design flow with the largest major treatment unit out of service, bypass for pretreatment facilities, and duplicate clarification facilities. All pumping facilities have capability for full capacity with the largest unit out of service.

Alternative No. 2 - Oxidation Ditch Aeration Basin and Clarifiers

Alternative No. 2 consists of construction of an oxidation ditch activated sludge aeration basin, with vertical turbine aeration, anoxic selector basins, and two new clarifiers for biological treatment of the wastewater. Other components of the treatment system, influent pump station, preliminary treatment, disinfection improvements, sludge processing, process and yard piping, electrical, instrumentation and site improvements, are all similar to the systems proposed in conjunction with upgrading the existing wastewater treatment system. System components are shown on Table 5-6. Table 5-7 shows the estimated construction cost of this alternative. A Schematic Flow Diagram for the Oxidation Ditch biological treatment is shown on Figure 5-4.

The oxidation ditch aeration basin is 0.8 mg in volume with two 75 HP vertical turbine surface aerators. The aeration would be automatically controlled for a preset dissolved oxygen concentration in order to save power. The two clarifiers are each 45-feet diameter. The return sludge pumping system would include a standby pump. The single aeration basin is sized for SRT of 7 days for BOD removal to secondary treatment standards, but not adequate for consistent ammonia removal. Class II reliability would be provided by installing at least two aerators. Two parallel clarifiers would provide Class II reliability. The system is projected to provide an effluent with 20 mg/l or less of BOD and TSS during summer operation, and 30 mg/l during the winter season. The aeration system is sized to provide for peak BOD loading. Clarifier overflow rate would be 330 gpd/sf for maximum month average flow, and 1,000 gpd/sf at maximum flow. An anoxic pretreatment selector cell would be included to improve settleability of the biological solids.

Alternative No. 3 - Sequencing Batch Reactor Activated Sludge

Alternative No. 3, a sequencing batch reactor activated sludge system, would be sized to accomplish the same effluent quality as is designed for the other two alternatives. This system requires three tanks, which would receive wastewater alternately and process the wastewater to achieve the effluent objective of 20 mg/l of BOD and TSS during the summer season, and 30 mg/l during winter operations. Biological nitrogen and phosphorus removal would not be consistently achieved. Batch cycles of six hours would provide for inflow to each basin for a two-hour period when the inflow would be switched to another basin.

Processing of the wastewater would be by sequential anoxic, aerobic and settling steps prior to decanting the clear supernatant from the basins. Effluent would be discharged over a short time period, thereby causing periods with no flow intermittent with periods of high flow from the system. An equalization basin would be constructed to regulate the flows to the disinfection system for continuous discharge.

Influent pump station, preliminary treatment, disinfection improvements, sludge processing improvements, process piping, electrical, instrumentation, site work and a new lab and operations building would be similar to those required for the other two alternatives. System components are shown on Table 5-8. Table 5-9 shows the estimated construction cost for the sequential batch reactor alternative. A schematic Flow Diagram for the treatment plant with the SBR facilities is shown on Figure 5-5.

This alternative, which comprises batch processing, provides for anoxic as well as aerobic cycles in the biological treatment. Settling is completely quiescent followed by supernatant withdrawal by a mechanism which withdraws the settled wastewater from near the surface. This process is capable of reducing the potential for filamentous organism growth problems, due to the anoxic stage, and enhancement of settling by this treatment step approximately equivalent to the oxidation ditch system.

COMPARISON OF ALTERNATIVES

The estimated construction costs for the three alternatives are shown on Tables 5-5, 5-7 and 5-9. The lowest first cost alternative, based on these estimates, is upgrading the existing treatment facilities, with the second lowest, about 2% higher, the oxidation ditch treatment system. The highest estimated cost is for the SBRs. While the apparent cost difference between upgrading the existing plant and the oxidation ditch activated sludge plant of about $130,000 appears to be significant, the level of accuracy of estimating would indicate that the alternatives are effectively nearly equal in estimated cost. Other relative advantages and disadvantages are as follows:

Upgrading Existing Treatment Facilities. Advantages of upgrading the existing plant include slightly lower cost. Disadvantages include the relatively shorter potential life of the existing facilities. The existing system does not have a selector system to select against filamentous organisms that could cause effluent suspended solids increase. The existing clarifiers, which are rectangular with reciprocating mechanisms, do not remove suspended solids or skimmings as efficiently as circular clarifiers with rotating mechanisms. The sludge withdrawal system and skimming system have previously caused problems. The aeration system needs to be upgraded. These deficiencies would be addressed.

Oxidation Ditch Activated Sludge. The oxidation ditch activated sludge system would include a pre-aeration anoxic process to select organisms for enhanced settling characteristics, and select against filamentous organisms, which could cause higher effluent suspended solids. It has also been shown that anoxic preliminary treatment helps reduce the amount of floating material (i.e. grease and oil materials) in aeration systems and therefore improves the quality of effluent. It can be asserted that this alternative would be expected to have a better quality effluent than the alternative for upgrading the existing secondary treatment components. This system is also easier to operate than either of the other two alternatives since it has fewer operating components.

Sequencing Batch Reactor Activated Sludge. The sequencing batch reactor activated sludge system also has the advantage of anoxic treatment to reduce the potential for suspended solids lost in the effluent and to reduce filamentous organism growth. It has the disadvantage of intermittent high and low discharge rates, requiring effluent equalization, more monitoring requirements, more complex operations, more automation requiring maintenance, more complex manual operation in the event of PLC failure, and the highest estimated cost for construction.

Alternative 4- Effluent Storage and Reuse ("No Discharge")

This section of Chapter 5 presents elements necessary to provide an effluent and reuse alternative that would allow the City of Umatilla to eliminate their effluent discharge into the Columbia River. Along with a discussion of the needed components of an effluent storage and reuse facility, an estimated cost to provide the facility is presented.

The evaluation to provide an effluent storage and reuse facility is not dependent on the choice of treatment alternative as it is anticipated that each of the three treatment alternatives considered would provide about the same level of secondary treatment. However, the overall cost to provide a complete system would be dependent on the choice of treatment alternative and for the purposes of estimating the overall system cost associated with Alternative 4, treatment Alternative 1 will be used. Given these facts, the effluent storage and reuse alternative evaluation includes the following:

1. Effluent pumping system capable of handling the projected peak hour flows and delivering the secondary effluent to the storage lagoons site;

2. At least two storage lagoons designed to provide enough capacity to handle at least 7 months of influent at the anticipated maximum monthly flows, and;

3. Effluent reuse site with suitable topography and soils and enough acreage to allow irrigation of selected crops at agronomic rates for a seven month irrigation season.

4. Cost estimate to provide the effluent storage and reuse facility including the estimated cost to provide an upgraded wastewater treatment facility (treatment Alternative 1).

Refer to Figure 5-6 for a schematic showing the elements of the effluent storage and reuse alternative.

Effluent Pumping System. An effluent pump station equipped with three pumps would be needed. The effluent pump station capacity, in order to meet DEQ requirements and have the necessary reliability, must be 3.2 mgd, the predicted peak hour flow, with the largest pump out of service. Based upon the design criteria that the mean velocity in a pressure sewer should be maintained between 2 and 5 feet per second, a 15-inch forcemain approximately 11,000 feet in length would be required to deliver the treated

wastewater to the proposed lagoon site. Refer to Figure 5-7 for a plan showing the effluent pump station and forcemain layout.

Storage Lagoons. Two lined storage lagoons capable of storing the effluent during an eight month period would be needed. Two lagoons would be required to provide the necessary operational flexibility and they would need to be lined in order to minimize the lagoon leakage into the surrounding groundwater.

Table 5-11 shows the water balance analysis along with the assumptions used to estimate the necessary storage capacity and irrigation area requirements. Based upon the water balance, the City would need approximately 224 million gallons of storage. Therefore, two 112 million gallon storage lagoons would need to be constructed. The lagoons would be designed with an 8-foot working depth, 2-foot of depth from the low water operating level to the lagoon bottom, and 3-foot of freeboard for a total lagoon depth from the top of the dike to the bottom of the lagoon of 13 feet. Considering these design criteria, the total water surface area at the high water operating level would be 85 acres. Refer to Figure 5-7 for a plan showing the lagoon site and layout and Table 5-12 for the estimated cost to provide the needed storage capacity.

Irrigation Site. An irrigation site with suitable topography and soils and enough area to allow application of the wastewater at agronomic rates would be needed. Table 5-11 shows the water balance analysis and assumptions used to estimate the required land for the sprayfield based upon an alfalfa crop. The water balance indicates that the City would need approximately 325 acres of land. Assuming three automatically controlled center pivot irrigation systems would be utilized, each pivot would irrigate about 110 acres. To complete the irrigation system, an irrigation pumping system along with the necessary wastewater distribution piping would be required. Refer to Figure 5-7 for a plan showing the irrigation pump, distribution piping systems, and the irrigation site and Table 5-12 for the estimated cost to provide the irrigation system.

Results of Alternative 4 Evaluation. As shown on Table 5-12, the total estimated capital cost to provide an effluent storage and reuse facility, including the upgrade to the existing wastewater treatment facility, is close to $21 million. The extremely high capital cost results from the need to provide 224 MG of storage, two pumping systems, 11,000 feet of 15-inch forcemain, and a 325-acre sprayfield. The City currently owns approximately 40 acres at the proposed site. Including the sprayfield, buffer zones, and lagoons, the City would need to acquire an estimated additional 540 acres of land to site the effluent storage and reuse facility. Although Alternative 4 has the advantage of potentially offsetting the initial capital cost by generating revenues through crop harvesting and selling, the amount of funds generated through crops would not likely be enough to make this alternative viable. Therefore, as long as the City of Umatilla maintains a National Pollution Discharge Elimination System Permit that allows the effluent to be discharged into the Columbia River, an effluent storage and reuse facility is not a viable alternative.

Environmental Review of Alternatives

Each wastewater treatment facility improvement alternative considered has associated environmental consequences. Environmental consequences can be beneficial, or adverse. Environmental consequences anticipated for each alternative are discussed below, and must be considered as part of the comparative evaluation of alternatives.

Upgrading Existing Treatment Facilities. Construction to upgrade existing treatment facilities would have several positive environmental consequences. First, an upgrade would allow for efficient stabilization and treatment of higher wastewater flows and loads that will certainly be realized in Umatilla. Increasing the capacity and efficiency of the existing treatment facility would limit the potential for raw or partially treated wastewater to be discharged to the environment. Second, disinfection improvements proposed under this alternative would eliminate the need to handle and store chlorine. The potential for high concentrations of chlorine in the effluent, or for a chlorine-related accident that could impact public health or air quality, would be eliminated. Third, the outfall extension proposed as part of the upgrade would increase effluent mixing and dilution, thereby reducing the potential for aquatically toxic pollutant levels near the outfall, or the potential for public contact with undiluted effluent. Finally, this alternative would result in increased stabilization of processed biosolids. Pathogenic organism levels in and vector attraction characteristics of finished biosolids would be controlled to levels considered acceptable by the EPA and DEQ.

Adverse impacts to the environment could result from the increased level of discharge to the Columbia River under this alternative, and through construction of new treatment units on currently vacant land. Because construction of TRCI is a high priority to the State of Oregon, and because some level of additional residential and economic development in and around Umatilla is inevitable, these adverse consequences are realistically unavoidable. The severity of adverse environmental impacts can be controlled by the construction of modern wastewater facilities, and through construction techniques that limit erosion on any new site.

Currently, the two properties under consideration for siting expanded facilities are not known to hold unique environmental or social significance, so consequences of developing on these lands may not create major concerns. An expanded investigation of the properties in question is currently being performed, including an archeological survey on one property that lies near an area containing Native American artifacts. Any new historical, cultural, or environmental conditions resulting from the expanded investigation will be addressed before any site is disturbed by construction.

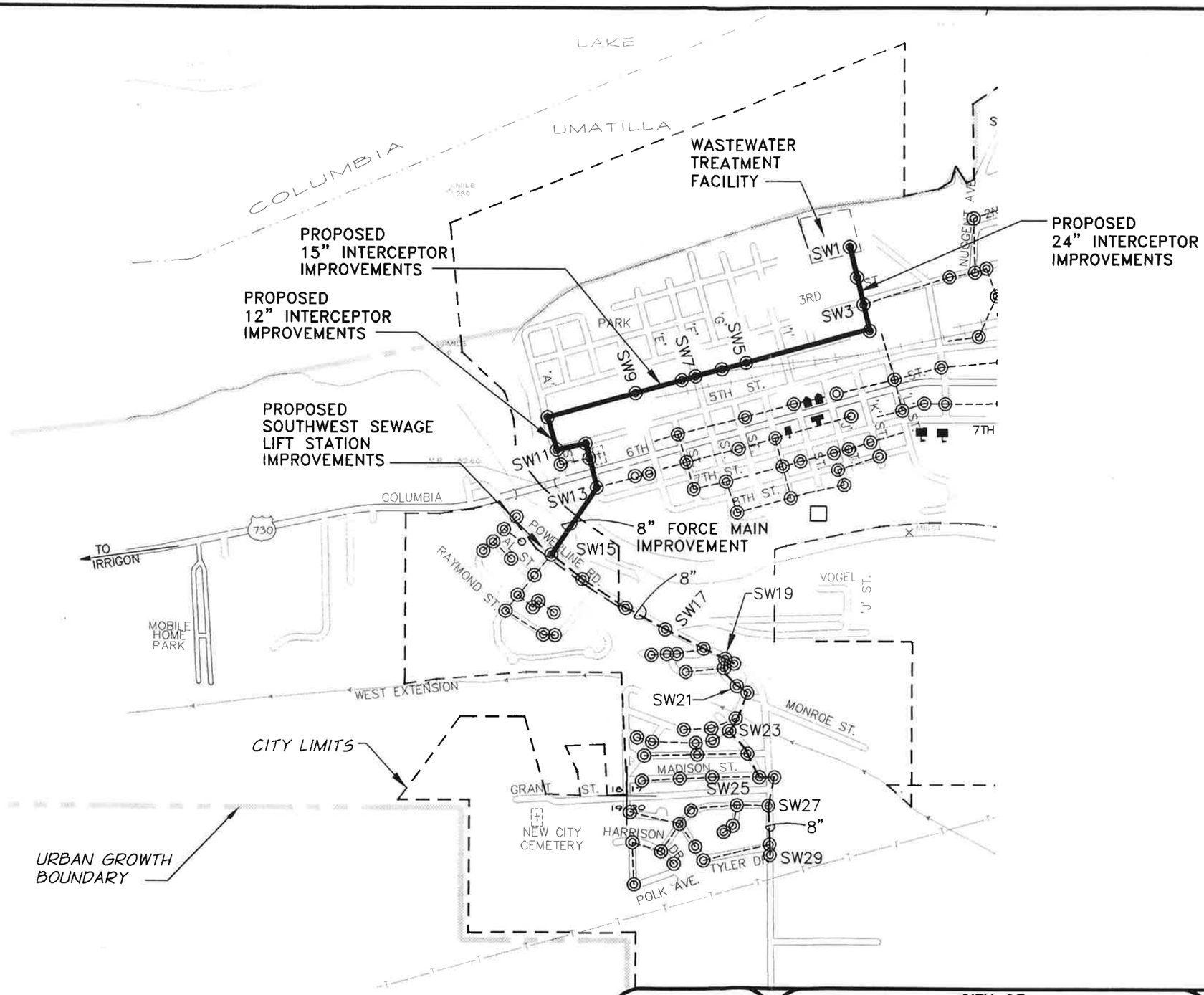
Oxidation Ditch Activated Sludge. Environmental consequences, both positive and negative, associated with the oxidation ditch alternative are essentially identical to consequences of an upgrade to existing facilities. A slight improvement in the consistency of effluent quality can be expected under the oxidation ditch alternative due to use of anoxic selector technology, and an expected increase in the control of liquid short-circuiting through treatment units. The oxidation ditch alternative would utilize the same property as the alternative to upgrade current facilities, and both alternatives include the

same associated improvements to effluent disinfection, sludge processing, and outfall components. Therefore, environmental consequences of these alternatives should be similar.

Sequencing Batch Reactor Activated Sludge. The SBR alternative generates no unique concerns for environmental consequences beyond those listed for the previous two alternatives. The same property, treatment goals, reliability criteria, and effluent disposal system would be used. Expected environmental consequences for the SBR alternative are similar to those expected for the other improvement projects involving a Columbia River discharge.

Effluent Storage and Reuse. Environmental consequences associated with the irrigation alternative are significantly different than under the three previous alternatives. Environmental benefits would include the elimination of the Columbia River discharge, and the beneficial capture of nutrients in treated effluent through crop uptake. On the negative side, the potential for groundwater quality degradation through irrigation water leaching, or by seepage through small failures in the storage pond liner system, must be considered. Also, public health concerns increase under this alternative. Irrigation drift or aerosols could produce an airborne pathway for human exposure to treated effluent, and the presence of numerous private drinking water supply wells in rural areas surrounding Umatilla creates a small potential for human consumption of groundwater tainted with effluent.

No Action Alternative. Under the "No Action" alternative, environmental consequences could include future discharges of raw or partially treated wastewater when the capacity of the existing treatment facility is exceeded, oxygen depletion below the outfall due to higher effluent BOD levels, continued discharge of chlorine to the Columbia River, and poor effluent mixing. In addition, insufficient sludge treatment would continue. These consequences are unacceptable. No major environmental or social benefits are envisioned for this alternative.



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CITY OF
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WASTEWATER SYSTEM STUDY
SOUTHWEST WASTEWATER
COLLECTION SYSTEM IMPROVEMENTS

FIGURE
5-1

PROPOSED 18" McNARY INTERCEPTOR IMPROVEMENTS

PROPOSED 15" McNARY INTERCEPTOR IMPROVEMENTS

PROPOSED 24" INTERCEPTOR IMPROVEMENTS

PROPOSED 8" FORCEMAIN IMPROVEMENTS

WASTEWATER TREATMENT FACILITY

EXISTING McNARY INTERCEPTOR

PROPOSED McNARY INDUSTRIAL PARK LIFT STATION IMPROVEMENTS

WILDWOOD LANE SEWAGE LIFT STATION

McNARY SEWAGE LIFT STATION

TO COLD SPRINGS JCT.

N

SCALE: 1"=2000'

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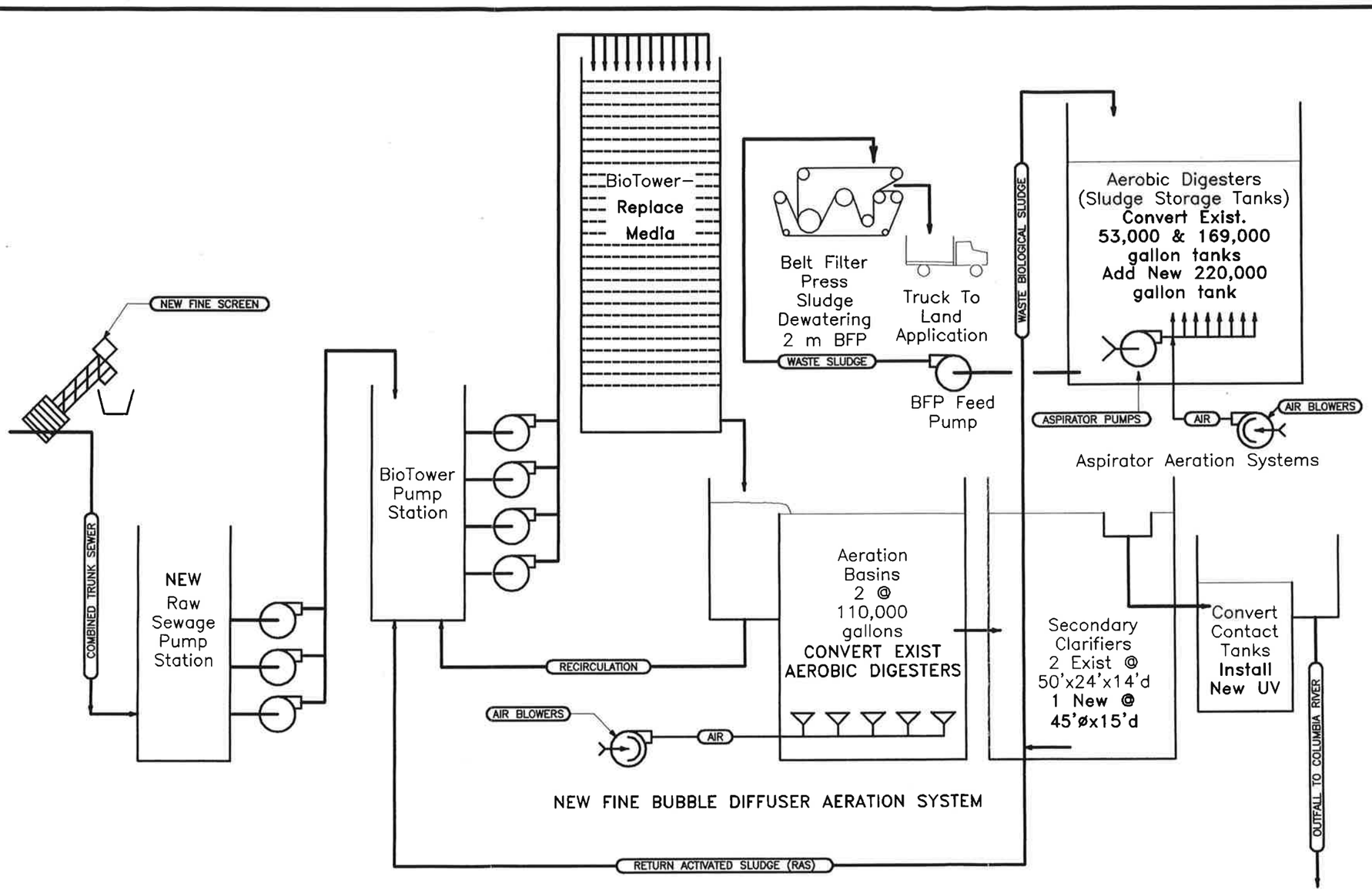
WASTEWATER SYSTEM STUDY

McNARY INTERCEPTOR AND LIFT STATION IMPROVEMENTS

FIGURE
5-2

PATH: J:\UMATCITY\WASTE\STUDY\FIG5-2.DWG



SCHEMATIC FLOW DIAGRAM – ALT. 1, UPGRADE EXTG. TREATMENT PLANT

No Scale

ESVELT ENVIRONMENTAL ENGINEERING
7605 East Hodin Drive., Spokane, WA 99212

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CITY OF
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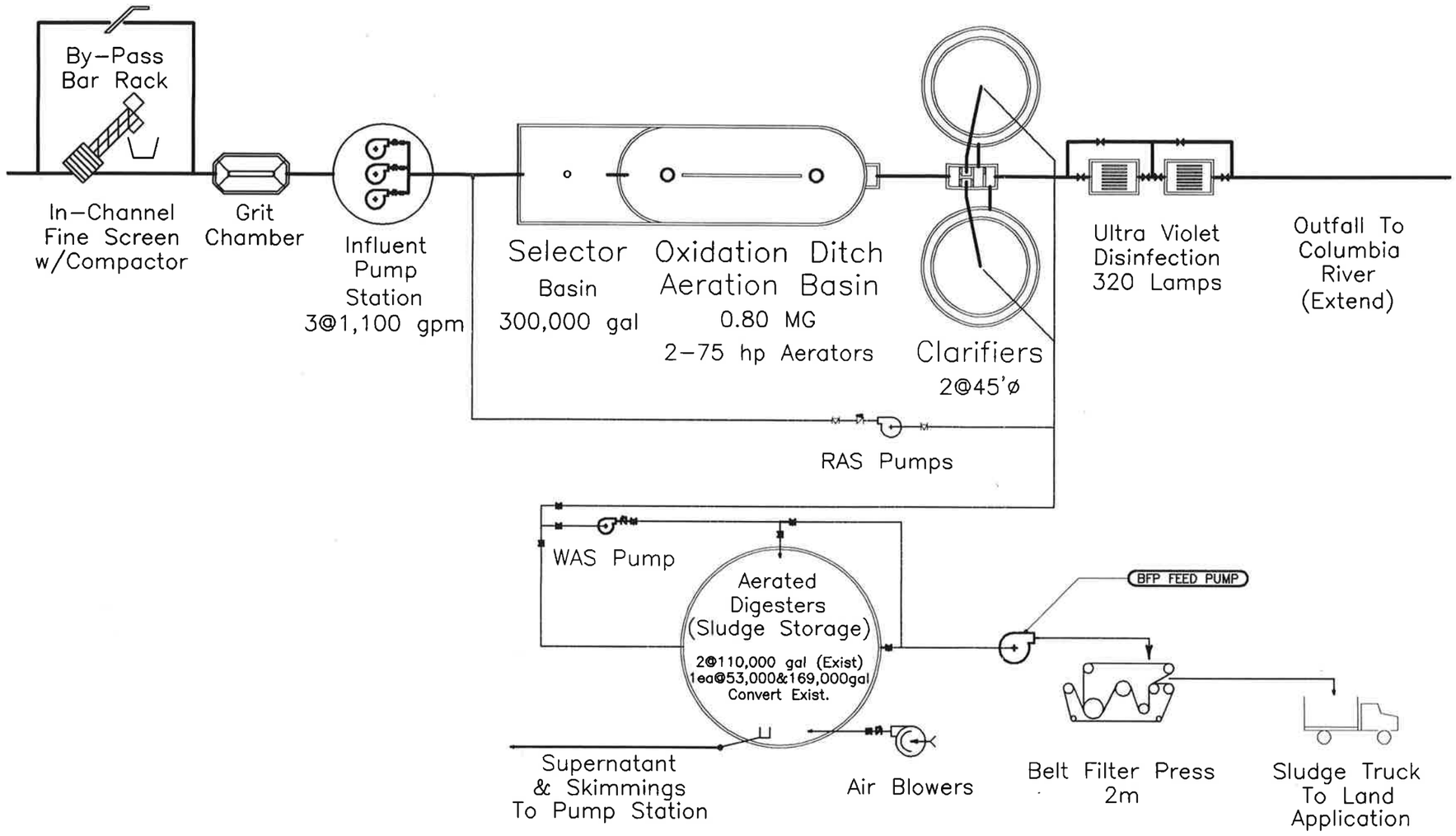
WASTEWATER SYSTEM STUDY
SCHEMATIC FLOW DIAGRAM ALT.1

FIGURE
5-3



SCHEMATIC FLOW DIAGRAM–ALT. 2, OXIDATION DITCH TREATMENT PLANT

NO SCALE

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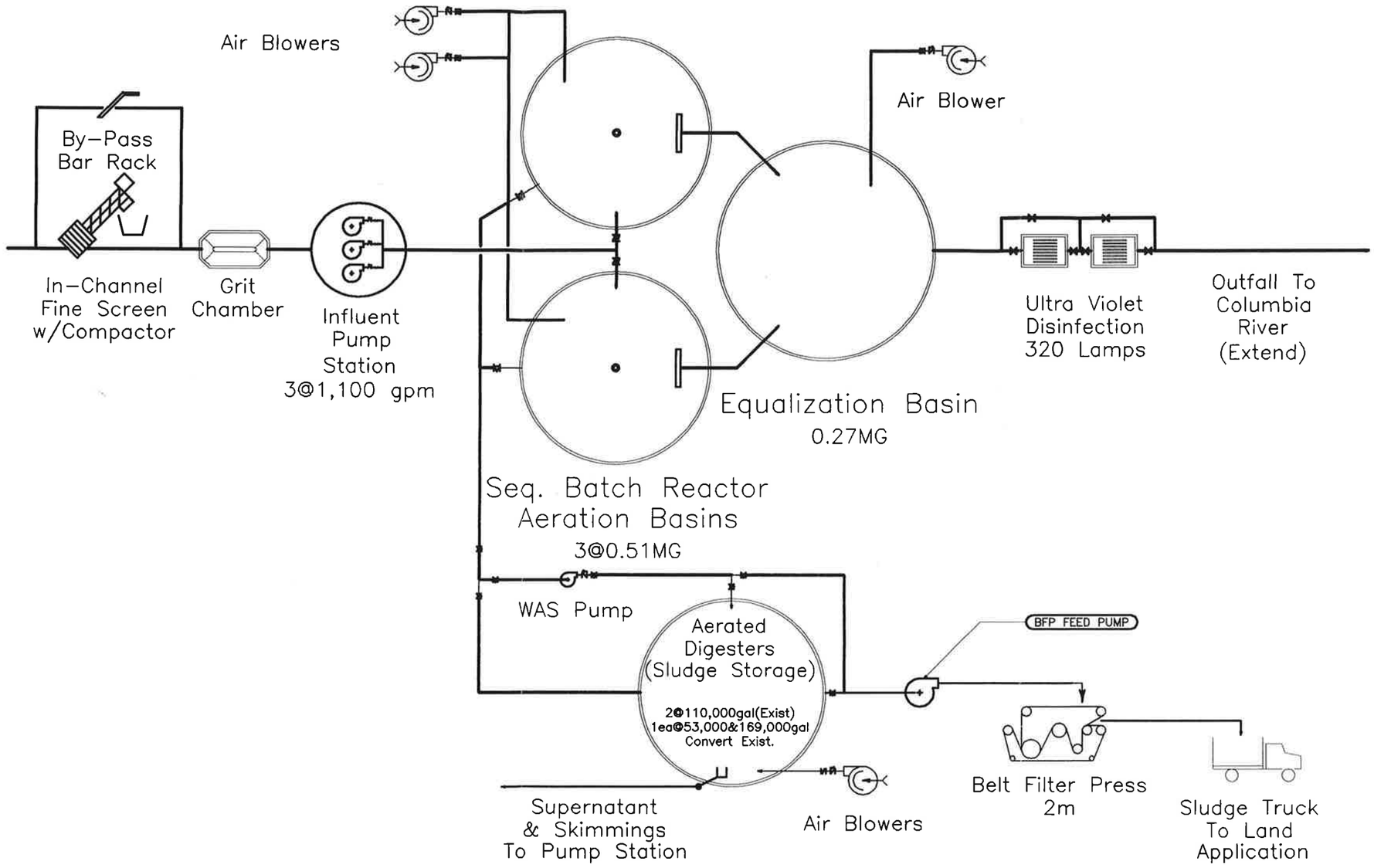
WASTEWATER SYSTEM STUDY
SCHEMATIC FLOW DIAGRAM ALT.2

FIGURE
5-4



SCHEMATIC FLOW DIAGRAM–ALT. 3, SEQUENCING BATCH REACTOR TREATMENT PLANT

NO SCALE

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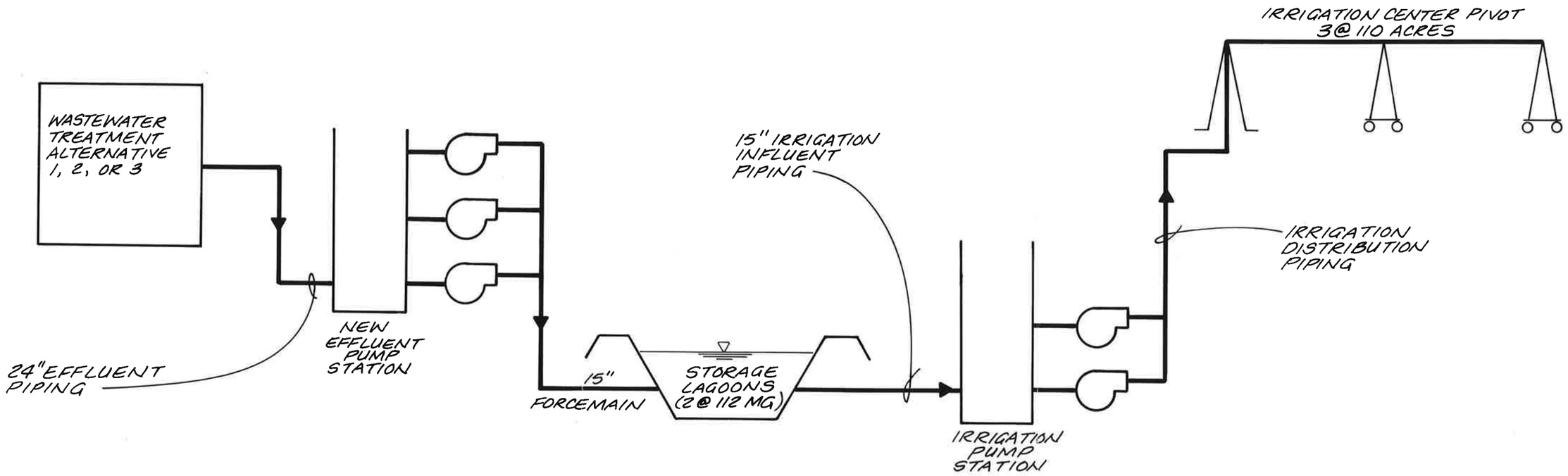
WASTEWATER SYSTEM STUDY

SCHEMATIC FLOW DIAGRAM ALT. 3

FIGURE
5-5



SCHEMATIC FLOW DIAGRAM – ALT. 4, EFFLUENT STORAGE & REUSE

NO SCALE

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CITY OF
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WASTEWATER SYSTEM STUDY
EFFLUENT STORAGE AND REUSE
SCHEMATIC – ALT. 4

FIGURE
5–6

165151

EFFLUENT PUMP STATION IMPROVEMENTS

15" FORCEMAIN IMPROVEMENTS

112 MG STORAGE LAGOON, TYP.

IRRIGATION PUMP STATION IMPROVEMENTS

12" IRRIGATION DISTRIBUTION PIPING

8" IRRIGATION DISTRIBUTION PIPING, TYP.

110 ACRE PIVOT, TYP.

WASTEWATER TREATMENT PLANT

CITY LIMITS

UMATILLA

COLUMBIA RIVER

WASHINGTON
OREGON

LAKE

UMATILLA

To Kennewick, WA

To Irrigon

To Cold Springs Jct.

To Hermiston

To I-84

McNary

Power City

Hermiston Jct.

Sharps Corner

T.5 N., R.28 E., W.M.
1" = 1600'±

CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
EFFLUENT STORAGE AND REUSE
ALT. 4

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FIGURE
5–7

165151

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
SOUTHWEST INTERCEPTOR AND LIFT STATION IMPROVEMENTS
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	31,500.00	All Req'd	$ 31,500.00
2	Temporary Protection & Direction of Traffic/Project Safety	LS	20,000.00	All Req'd	20,000.00
3	12-inch Sewer Pipe	LF	25.00	2,150	53,800.00
4	15-inch Sewer Pipe	LF	27.00	2,000	54,000.00
5	Manholes	EA	1,800.00	14	25,200.00
6	Rock Excavation	CY	60.00	1,200	72,000.00
7	Asphalt Surface Restoration	SY	25.00	550	13,800.00
8	South Hill Lift Station Improvements	LS	100,000.00	All Req'd	100,000.00
9	8-inch River Crossing (Forcemain)	LF	100.00	750	75,000.00
10	Service Line Reconnections	LS	5,000.00	All Req'd	5,000.00
				Estimated Construction Costs	450,300.00
				Engineering, Contingency, Administration, Legal, 35%	157,600.00
				TOTAL ESTIMATED COST	**$ 607,900.00**

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
NEW McNARY INTERCEPTOR
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	84,500.00	All Req'd	$ 84,500.00
2	Temporary Protection & Direction of Traffic/Project Safety	LS	30,000.00	All Req'd	30,000.00
3	18-inch Sewer Pipe	LF	35.00	17,600	616,000.00
4	15-inch Sewer Pipe	LF	27.00	3,000	81,000.00
5	24-inch Sewer Pipe	LF	38.00	900	34,200.00
6	Manholes	EA	1,800.00	54	97,200.00
7	Rock Excavation	CY	60.00	4,400	264,000.00
				Estimated Construction Costs	1,206,900.00
				Engineering, Contingency, Administration, Legal, 35%	422,400.00
				Right-of-Way	50,000.00
				TOTAL ESTIMATED COST	**$ 1,679,300.00**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
NEW McNARY INTERCEPTOR
COST ESTIMATE

TABLE
5-2

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
NEW McNARY INDUSTRIAL PARK LIFT STATION & FORCEMAIN
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	19,000.00	All Req'd	$ 19,000.00
2	Lift Station	LS	150,000.00	All Req'd	150,000.00
3	8-inch Forcemain	LF	22.00	2,200	48,400.00
4	Rock Excavation	CY	60.00	900	54,000.00
				Estimated Construction Costs	271,400.00
				Engineering, Contingency, Administration, Legal, 35%	95,000.00
				TOTAL ESTIMATED COST	**$ 366,400.00**

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 1
MODIFICATIONS TO EXISTING PLANT
SYSTEM COMPONENTS

1. New Pump Station
   - 3.1 MGD - 3 pumps at 1,100 gpm
2. Preliminary Treatment
   - Mechanical Bar Screens
   - Flow Metering
   - Fine Screens
3. Rehabilitate Biotower
   - Replace Media - 8,000 SF
4. Aeration Basins
   - Convert Existing Aerobic Digesters to Aeration Basins
   - New Aeration Basin
5. Upgrade Existing Clarifier
   - Rehabilitate Mechanisms
   - New Pumps
   - New Piping and Piping Modifications
6. New Secondary Clarifier
   - 45 feet diameter x 15 feet clarifier
   - RAS/WAS Pump Station
7. New Disinfection System
   - 320 Lamps System within Existing Chlorine Contact Tanks
8. Sludge Storage Tanks
   - Convert Old Abandon Tanks
   - New Tank - 0.22 MGD
9. Sludge Dewatering
   - Belt Filter Press - 2 M, Polymer Feed, Conveyors
   - Building and Temporary Storage
10. Process and Yard Piping

11. Electrical

12. Instrumentation and Control

13. Site Work, Demolition, and Rehabilitation

14. New Laboratory and Operation Building
    - 2,400 SF Building
    - Laboratory Equipment and Furnishings

15. Maintenance Building
    - 1,800 SF building

16. Sludge Hauling and Application
    - 15 CY Sludge Truck

17. Land
    - 10 Acre (includes existing lease area)

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 1 - MODIFICATIONS TO EXISTING SYSTEM COMPONENTS

TABLE 5-4 Cont'd

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 1
MODIFICATION TO EXISTING TREATMENT PLANT
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	425,000.00	All Req'd	$ 425,000.00
2	New Pump Station	LS	400,000.00	All Req'd	400,000.00
3	Preliminary Treatment	LS	674,000.00	All Req'd	674,000.00
4	Rehab Bio-Tower	LS	150,000.00	All Req'd	150,000.00
5	Aeration Basins	LS	648,000.00	All Req'd	648,000.00
6	Upgrade Existing Clarifiers	LS	135,000.00	All Req'd	135,000.00
7	New Secondary Clarifier	LS	375,000.00	All Req'd	375,000.00
8	New Disinfection system	LS	358,000.00	All Req'd	358,000.00
9	Sludge Storage Tanks	LS	318,000.00	All Req'd	318,000.00
10	Sludge Dewatering	LS	612,000.00	All Req'd	612,000.00
11	Process and Yard Piping	LS	440,000.00	All Req'd	440,000.00
12	Electrical	LS	440,000.00	All Req'd	440,000.00
13	Instrumentation and Control	LS	284,000.00	All Req'd	284,000.00
14	Site Work, Demo, Rehabilitation	LS	283,000.00	All Req'd	283,000.00
15	New Laboratory and Operations Building	LS	410,000.00	All Req'd	410,000.00
16	Maintenance Building	LS	126,000.00	All Req'd	126,000.00
				Estimated Construction Costs	6,078,000.00
				Engineering, Contingency, Administration, Legal, 35%	2,127,000.00
				Equipment	130,000.00
				Land Acquisition (10 Acres)	100,000.00
				TOTAL ESTIMATED COST	**$ 8,435,000.00**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 1 - MODIFICATION TO EXISTING
COST ESTIMATE

TABLE
5-5

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 2
OXIDATION DITCH TREATMENT PLANT
SYSTEM COMPONENTS

1. New Pump Station
   - 3.1 MGD - 3 pumps at 1,100 gpm
2. Preliminary Treatment
   - Mechanical Bar Screens
   - Flow Metering
   - Fine Screens
3. Aeration Basin
   - Oxidation Ditch - 0.8 MG, Selector - 0.27 MG
4. New Secondary Clarifiers
   - 2 at 45 feet diameter x 15 feet tanks
   - RAS/WAS Pump Station
5. New Disinfection System
   - 320 Lamp System within Existing Chlorine Contact Tanks
6. Sludge Storage Tanks
   - Convert Old Abandon Tanks and Existing Tanks
7. Sludge Dewatering
   - Belt Filter - 2 M, Polymer Feed, Conveyors
   - Building and Temporary Storage
8. Process and Yard Piping
9. Electrical
10. Instrumentation and Control
11. Site Work, Demolition, and Rehabilitation
12. New Laboratory and Operation Building
    - 2,400 SF Building
    - Laboratory Equipment and Furnishings

13. Maintenance Building
    - 1,800 SF building

14. Sludge Hauling and Application
    - 15 CY Sludge Truck

15. Land
    - 10 Acre (includes existing lease area)

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 2 - OXIDATION DITCH TREATMENT SYSTEM COMPONENTS

TABLE 5-6 Cont'd

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 2
OXIDATION DITCH TREATMENT PLANT
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	432,000.00	All Req'd	$ 432,000.00
2	New Pump Station	LS	400,000.00	All Req'd	400,000.00
3	Preliminary Treatment	LS	674,000.00	All Req'd	674,000.00
4	Aeration Basin	LS	792,000.00	All Req'd	792,000.00
5	New Secondary Clarifiers	LS	750,000.00	All Req'd	750,000.00
6	New Disinfection System	LS	358,000.00	All Req'd	358,000.00
7	Sludge Storage Tanks	LS	150,000.00	All Req'd	150,000.00
8	Sludge Dewatering	LS	612,000.00	All Req'd	612,000.00
9	Process and Yard Piping	LS	448,000.00	All Req'd	448,000.00
10	Electrical	LS	448,000.00	All Req'd	448,000.00
11	Instrumentation and Control	LS	287,000.00	All Req'd	287,000.00
12	Site Work, Demo, Rehabilitation	LS	287,000.00	All Req'd	287,000.00
13	New Laboratory and Operations Building	LS	410,000.00	All Req'd	410,000.00
14	Maintenance Building	LS	126,000.00	All Req'd	126,000.00
				Estimated Construction Costs	6,174,000.00
				Engineering, Contingency, Administration, Legal, 35%	2,161,000.00
				Equipment	130,000.00
				Land Acquisition (10 Acres)	100,000.00
				TOTAL ESTIMATED COST	**$ 8,565,000.00**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 2-OXIDATION DITCH TREATMENT
COST ESTIMATE

TABLE
5-7

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 3
SEQUENCING BATCH REACTOR TREATMENT PLANT
SYSTEM COMPONENTS

1. New Pump Station
   - 3.1 MGD - 3 pumps at 1,100 gpm
2. Preliminary Treatment
   - Mechanical Bar Screens
   - Flow Metering
   - Fine Screens
3. Batch Reactor Basins
   - 3 at 0.51 MG, Aeration, Controls, Mix Decant
4. Equalization Basins
   - 0.3 MG, Aeration
5. New Disinfection System
   - 320 Lamps System within Existing Chlorine Contact Tanks
6. Sludge Storage Tanks
   - Convert Old Abandon Tanks
   - New Tank - 0.22 MGD
7. Sludge Dewatering
   - Belt Filter Press - 2 M, Polymer Feed, Conveyors
   - Building and Temporary Storage
8. Process and Yard Piping
9. Electrical
10. Instrumentation and Control
11. Site Work, Demolition, and Rehabilitation
12. New Laboratory and Operation Building
    - 2,400 SF Building
    - Laboratory Equipment and Furnishings

13. Maintenance Building
    - 1,800 SF building

14. Sludge Hauling and Application
    - 15 CY Sludge Truck

15. Land
    - 10 Acre (includes existing lease area)

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 3-SEQUENCING BATCH REACTOR
SYSTEM COMPONENTS

TABLE
5-8
Cont'd

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 3
SEQUENCING BATCH REACTOR TREATMENT PLANT
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	483,000.00	All Req'd	$ 483,000.00
2	New Pump Station	LS	400,000.00	All Req'd	400,000.00
3	Preliminary Treatment	LS	674,000.00	All Req'd	674,000.00
4	Batch Reactor Basins	LS	1,798,000.00	All Req'd	1,798,000.00
5	Equilization Basin	LS	283,000.00	All Req'd	283,000.00
6	New Disinfection System	LS	358,000.00	All Req'd	358,000.00
7	Sludge Storage Tanks	LS	150,000.00	All Req'd	150,000.00
8	Sludge Dewatering	LS	612,000.00	All Req'd	612,000.00
9	Process and Yard Piping	LS	513,000.00	All Req'd	513,000.00
10	Electrical	LS	513,000.00	All Req'd	513,000.00
11	Instrumentation and Control	LS	287,000.00	All Req'd	287,000.00
12	Site Work, Demo, Rehabilitation	LS	287,000.00	All Req'd	287,000.00
13	New Laboratory and Operations Building	LS	410,000.00	All Req'd	410,000.00
14	Maintenance Building	LS	126,000.00	All Req'd	126,000.00
				Estimated Construction Costs	6,894,000.00
				Engineering, Contingency, Administration, Legal, 35%	2,413,000.00
				Equipment	130,000.00
				Land Acquisition (10 Acres)	100,000.00
				TOTAL ESTIMATED COST	**$ 9,537,000.00**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 3-SEQUENCING BATCH REACTOR
COST ESTIMATE

TABLE
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CITY OF UMATILLA
OUTFALL PIPING IMPROVEMENTS
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	9,400.00	All Req'd	$ 9,400.00
2	Outfall Piping	LF	500.00	250	125,000.00
				Estimated Construction Costs	134,400.00
				Engineering, Contingency, Administration, Legal, 35%	47,000.00
				TOTAL ESTIMATED COST	**$ 181,400.00**

City of Umatilla
Alternative 4
Effluent Storage and Reuse
Water Balance

	STORAGE LAGOONS												IRRIGATION AREA				
	Influent				Precipitation		Evaporation		Seepage	Irrigation	Storage	Cumulative	Alfalfa		Non-Crop Water		TOTAL
	Domestic	Industrial	TRCI	TOTAL							+ into Strg.	Storage	325.8	Acres	Application		
											(- out of Strg.)		Gross Irrigation Requirement		325.8	Acres	
Month	(MG)	(MG)	(MG)	(MG)	(in)	(MG)	(in)	(MG)	(MG)	(MG)	(MG)	(MG)	(in)	(MG)	(in)	(MG)	(MG)
Oct	21.7	0.0	6.8	28.5	0.80	1.85	2.78	6.42	0	0.0	23.9	23.9	0.00	0.0	0.00	0.0	0.0
Nov	21.0	0.0	6.6	27.6	1.95	4.50	1.00	2.31	0	0.0	29.8	53.7	0.00	0.0	0.00	0.0	0.0
Dec	21.7	0.0	6.8	28.5	2.62	6.05	1.00	2.31	0	0.0	32.2	85.9	0.00	0.0	0.00	0.0	0.0
Jan	21.7	0.0	6.8	28.5	1.13	2.61	1.00	2.31	0	0.0	28.8	114.7	0.00	0.0	0.00	0.0	0.0
Feb	17.8	0.0	6.2	23.9	1.77	4.08	1.00	2.31	0	0.0	25.7	140.4	0.00	0.0	0.00	0.0	0.0
Mar	21.7	0.0	6.8	28.5	2.23	5.15	2.41	5.56	0	0.0	28.1	168.5	0.00	0.0	0.00	0.0	0.0
Apr	21.0	0.0	6.6	27.6	3.67	8.47	3.80	8.77	0	0.0	27.3	195.7	0.00	0.0	0.00	0.0	0.0
May	21.7	0.0	6.8	28.5	5.31	12.25	5.54	12.79	0	0.0	27.9	223.6	0.00	0.0	0.00	0.0	0.0
Jun	21.0	0.0	6.6	27.6	1.09	2.52	6.77	15.62	0	57.8	-43.3	180.3	6.53	57.8	0.00	0.0	57.8
Jul	21.7	0.0	6.8	28.5	0.34	0.78	7.92	18.28	0	97.5	-86.5	93.8	11.02	97.5	0.00	0.0	97.5
Aug	21.7	0.0	6.8	28.5	0.60	1.38	6.76	15.60	0	79.4	-65.2	28.6	8.98	79.4	0.00	0.0	79.4
Sep	21.0	0.0	6.6	27.6	0.44	1.02	4.42	10.20	0	47.0	-28.6	0.0	5.31	47.0	0.00	0.0	47.0
TOTALS	253.2	0.0	80.3	333.5	21.95	50.7	44.40	102.5	0.0	281.7			31.84	281.7	0.0	0.0	281.7

Req'd Storage Lagoons Surface Area = 85 Acres
Req'd Storage Lagoons Volume = 224 Million Gallons

Notes:
1. Influent - Domestic, Industrial and TRCI flows are based upon the design criteria presented in Chapter 3. Maximum Monthly Flow is assumed for each month.
2. Precipitation. Utilized wettest year on record with the Oregon Climate Service, Oregon State University, for Hermiston, 1983 calendar year. For purposes of the analysis, it was assumed that crop water demand for the months of April and May was met totally through precipitation.
3. Evaporation. Utilized data obtained from the Oregon Climate Service, Oregon State University, for Hermiston, multiplied by a 0.7 pan factor.
4. Seepage is assumed to be negligible as the lagoon would be lined and for purposes of the analysis it will be assumed to be zero.
5. Crop Water Use. Data obtained for the Oregon State University Extension Service for the Umatilla area. 80% water application efficiency assumed.
6. Non-Crop Water Application. Accounts for late season irrigation used for general purposes including field preparation, leaching, seed bed preparation, etc.

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 4 - EFFLUENT STORAGE AND REUSE
WATER BALANCE

TABLE
5-11

140595

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 4
EFFLUENT STORAGE AND REUSE
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	375,000.00	All Req'd	375,000.00
2	Temporary Protection & Direction of Traffic/Project Safety	LS	65,000.00	All Req'd	65,000.00
3	Effluent Pump Station	LS	350,000.00	All Req'd	350,000.00
4	15-inch Forcemain	LF	28.00	11,000	308,000.00
5	Lagoons and Lagoon Piping	LS	6,020,000.00	All Req'd	6,020,000.00
6	Irrigation Pump Station	LS	285,000.00	All Req'd	285,000.00
7	Irrigation System including Pivots and Piping	LS	255,000.00	All Req'd	255,000.00
8	Rock Excavation	CY	60.00	10,500	630,000.00
9	Electrical	LS	350,000.00	All Req'd	350,000.00
				Estimated Construction Costs	8,638,000.00
				Engineering, Contingency, Administration, Legal, 35%	3,023,300.00
				Land Acquisition (540 Acres)	972,000.00
				Treatment Alternative 1 - Modification to Existing Treatment Plant	8,435,000.00
				TOTAL ESTIMATED COST	$21,068,300.00

CHAPTER 6

SELECTED IMPROVEMENTS

GENERAL

This section of the Wastewater System Study presents the selected improvement alternatives to meet the 20-year design requirements for wastewater collection, treatment, and discharge systems. These improvement alternatives were selected from a review of the alternatives and associated cost estimates provided within Chapter 5. City staff, the City Public Works Committee, the City Council, the Oregon Department of Corrections, the Port of Umatilla, and certain major users at the McNary Industrial Park had a part in the review and selection process. Additionally, the public was given the opportunity to review and comment on the draft of the study which included the selected improvement alternatives.

Figure 6-1 shows the selected improvements chosen by the City Council upon the recommendation of the Engineer. In general, the improvements include the new McNary Interceptor, the McNary Industrial Park Lift Station and Forcemain Improvements, the Southwest Interceptor Improvements, the Southwest Lift Station and Forcemain Improvements, a new Oxidation Ditch Wastewater Treatment Facility, and the Outfall Improvements to the Umatilla River. Table 6-1 provides a summary of the estimated cost of the selected improvements. Table 6-1 is followed by individual cost estimates for each of the selected improvements. The remainder of this section of the study describes the final design criteria, the collection system improvements, the treatment facility improvements, and the outfall improvements to the Umatilla River.

FINAL DESIGN CRITERIA

As a result of the review and selection process, certain changes to the wastewater treatment design criteria shown in Chapter 3 were needed. In Chapter 3, three primary users were identified; the City of Umatilla, Two Rivers Correctional Institute, and the Industrial Sector. Flow and loading criteria were given for each of these groups considering a 20-year design period. Based on final discussions with the Port of Umatilla and users within the McNary Industrial Park, the existing flows anticipated from ConAgra Onion Dehydration Plant, and projected flows and loadings from the McNary Industrial Park were eliminated from the wastewater treatment design criteria to be used for sizing the wastewater treatment plant. This means that the existing users at the McNary Industrial Park will be utilizing City capacity until that capacity is needed by the City. At that time, the Industrial Park will either provide the additional treatment capacity, or will no longer be able to use the system. The collection system design criteria given in Chapter 3 remains unchanged since the Department of Corrections, the City of Umatilla, and the McNary Industrial Park users will be funding the improvements needed for all users. The wastewater treatment design criteria is as follows:

WASTEWATER TREATMENT DESIGN FLOWS AND LOADINGS

Design Parameter	Flow, MGD	BOD (lbs/day)	TSS (lbs/day)
City of Umatilla	0.635	1,280	1,000
TRCI	0.200	670	670
Industrial Sector	0.0	0	0
Average Design	0.835	1,950	1,670
Maximum Month	0.919	2,600	2,700
Maximum Day	1.336	2,900	3,300
Peak Hour	3.200	--	--

COLLECTION SYSTEM IMPROVEMENTS

The collection system improvements include the Southwest Interceptor, the Southwest Sewage Lift Station and Forcemain, the new McNary Interceptor, and the new McNary Industrial Park Lift Station and Forcemain. Referring to Figure 6-1, the Southwest Interceptor includes 12-inch and 15-inch interceptor improvements, connection to the 24-inch McNary Interceptor, and connection to the Southwest 8-inch Forcemain Improvements. The Southwest Interceptor is sized to carry 2.1 MGD, which is the peak hour flow anticipated from full build-out of undeveloped Southwest Umatilla area commercial and residential sectors.

The Southwest Lift Station and Forcemain Improvements include an 8-inch forcemain crossing the Umatilla River and connecting to the new interceptor line, and replacement of the existing Southwest Lift Station. The Southwest Lift Station Improvements include a new wet well, duplex pumping system, and new pumping system control panel. The lift station capacity is 0.657 MGD, which is the 20-year peak flow for the contributing area. Table 6-2 shows the estimated cost for the Southwest Interceptor and Lift Station Improvements.

The new McNary Interceptor Improvements include 15-inch, 18-inch, and 24-inch interceptor lines to carry flows from the Two Rivers Correctional Institute and McNary Industrial Park to the headworks of the new wastewater treatment facility. The interceptor is sized to carry the accumulated peak hour from the two sources. The design peak hour flow is estimated at 1.712 MGD downstream of the McNary Industrial Park connection, and 0.560 MGD upstream of this point. Table 6-3 provides the estimated cost for the new McNary Interceptor Improvements.

The new McNary Industrial Park Lift Station and Forcemain Improvements include an 8-inch forcemain and a new lift station to carry flow from the existing gravity collection system to the new McNary Interceptor. The Lift Station Improvements include a wet well, duplex pumping system, and a pumping system control panel. The forcemain and lift

station are designed to meet the 20-year capacity requirements of 0.560 MGD. Table 6-4 details the estimated cost of the improvements.

WASTEWATER TREATMENT FACILITY IMPROVEMENTS

The selected alternative for treatment of the wastewater is the Oxidation Ditch Treatment Facility (Alternative 2) described in Chapter 5, along with other needed upgrade of existing facilities and the addition of new components to meet the design criteria.

The selected treatment system recommended for construction by the City of Umatilla will meet effluent requirements for BOD and TSS removal, disinfection, elimination of chlorine induced toxicity, and will provide a reliable and long-life treatment facility. The Oregon Department of Environmental Quality has indicated that ammonia removal will not be required within this permit cycle, and no major industrial user has indicated that it will require increase in the size of the treatment capacity. Criteria for the facility now includes the following:

1. Design to meet the expected loads through the year 2020, as shown in Chapter 3, excluding flows from ConAgra and projected future flows from the McNary Industrial Park.

2. Class II reliability. This means that all mechanical components (pumps, aerators, sedimentation basins, disinfection equipment) would have backup to allow operation with the largest single component out of service. Two units of each treatment component would be provided so that at least 50 percent capacity would remain with the largest unit out of service, except that only one aeration basin will now be provided. This meets the requirements since two aerators are provided.

3. Operator-friendliness to minimize the number of operators necessary to operate the facility.

4. Treatment to meet the requirements of the Oregon Department of Environmental Quality (DEQ) for secondary treatment. This is interpreted as meeting the Effluent Criteria shown in Chapter 3 for biochemical oxygen demand (BOD), total suspended solids (TSS), and fecal coliform or E. coli bacteria.

5. Disinfection with ultra violet light to eliminate chlorine toxicity.

6. Discharge of the treated effluent to the Columbia River via an outfall submerged at all times, which will provide adequate dilution for the effluent to minimize ammonia toxicity.

7. Sludge treated to meet a minimum of Class B biosolids criteria, dewatered for ease of handling.

Selection of Alternative.

The selected facility was based on cost-effectiveness to meet effluent quality requirements. Various alternatives were considered, including upgrading the existing plant and other configurations of activated sludge treatment. City personnel visited other installations and interviewed operators and owners of other treatment facilities to help them assess the relative effectiveness, efficiency and ease of operation of the alternatives considered.

Initial consideration included so-called "low-cost" construction such as prefabricated metal components (i.e. clarifiers) inside of the aeration tanks, and construction with synthetic membrane and concrete. These were rejected based on their relatively short structural life (i.e. approximately 15 years versus approximately 40 years for the selected alternative), and relative costs which were comparatively equivalent to the selected alternative when replacement at the shortened life is considered. Comparative cost data from other installations was used to assist in evaluation of these alternatives.

The upgraded treatment facilities will include the following improvements. Refer to Figure 6-2 for a schematic site plan of the upgraded facilities, and Figure 6-3 for a schematic flow diagram of the new plant.

1. **Raw Sewage Pumping Station**. A new pump station facility will be constructed to meet the new requirements. The pump station capacity will be 3.2 MGD, the predicted maximum flow, with the largest pump out of service to meet the reliability requirements (this requirement would be the same regardless of class of reliability).

2. **Preliminary Treatment**. A new fine screen facility and grit removal system will be added. Capacity of the new preliminary treatment facilities will be 3.2 MGD. An in-channel mechanical fine screen with a screenings washer and compactor will be provided. Bypass of the fine screen will be provided through a bar rack, manually cleaned. A centrifugal type grit removal chamber with a grit washer and classifier will be constructed. A bypass will allow capability for cleaning and maintenance.

3. **New Oxidation Ditch Activated Sludge Treatment Facilities**. The biological treatment will be an oxidation ditch configured aeration basin, using vertical turbine aerators. This type of aeration provides an intensive aeration and mixing zone and provides for continuous velocity in the oxidation ditch to maintain the biological solids in suspension. This system has low operator demands and low power consumption. It has been demonstrated to produce an effluent meeting secondary treatment criteria and is relatively simple construction, which allows for low cost. Reliability would be provided by installation of two aerators. The aeration basin will be 0.8 million gallons volume.

Anoxic "selector" basins will be constructed ahead of the oxidation ditch aeration basin. These will result in better settling mixed liquor solids. Two basins, each approximately 150,000 gallons volume, will be mixed with mechanical mixers. The basins will receive the raw screened degritted sewage and the return activated sludge from the clarifiers.

4. **Secondary Clarifiers**. Two circular clarifiers with rotating mechanisms will be constructed, designed to rapidly remove the settled solids for return to the selector and aeration basins. The clarifiers will be 45-foot diameter by 14-foot sidewall depth, and will be constructed of concrete.

5. **Return and Waste Sludge Pumping Stations**. Return activated sludge (RAS) pumps will be provided to pump settled biological solids from the clarifiers to the selector basins for mixing with the pre-treated raw wastewater. Additional pumps will be located in the RAS pump stations to pump excess biological solids (waste activated sludge, WAS) to the sludge storage tanks (aerobic digesters).

6. **Disinfection System Improvements**. The selected plan calls for changing the disinfection to a new ultra-violet light (UV) system. This system will consume additional power, but will not be a toxic spill hazard, which could affect the health and safety of treatment facility workers, and the public in the vicinity of the treatment plant, and it will not add chemicals toxic to aquatic lift to the effluent. It is currently planned to convert the existing chlorine contact basin to a UV disinfection basin with the installation of a UV lamp system.

7. **Outfall Extension**. Extension of the existing outfall is needed to provide improved mixing of the effluent with waters of the Columbia River.

8. **Sludge Processing**. Sludge from the biological treatment (oxidation ditch activated sludge) would be primarily biological in nature and would be wasted from the biological system at a concentration of about 1 percent dry solids (1% DS). Further processing of the sludge is inefficient at this low concentration and, therefore, provisions for sludge thickening by gravity belt thickener or improvements of provisions for decanting from the aerobic digestion tanks would be provided. A combined gravity belt thickener/belt filter dewatering press is planned and will be selected following further investigation during design.

   Sludge processing to meet requirements for Class B biosolids quality as defined by Federal Regulations 40CFR503 to allow disposal on agricultural land (non-food crops) is needed. Aerobic digestion as currently used at the plant is only marginally capable of sludge treatment to this level, but it is included with each of the alternatives evaluated. The aerobic digestion tanks will provide storage capability to allow for inability to remove sludge

from the site during some seasonal weather conditions. The capacity of the existing aerobic digestion tanks is inadequate for future treatment plant loadings, and it is proposed to convert the treatment tanks from the old "contact-stabilization" plant for additional capacity.

Sludge dewatering is needed in order to provide efficient handling of the waste sludge (biosolids). It is proposed to include belt filter press dewatering capability (combined thickener/belt press) to achieve dewatered sludge concentrations of about 16% DS. This would allow efficient transport of the solids for land application, or to a commercial composting facility, such as the facility proposed for construction near Stanfield by Columbia Humus.

9. **Yard and Process Piping**. Yard and process piping improvements will be constructed to serve the treatment facilities, including the pretreatment area (screening and grit removal), biological treatment facility, clarifiers, disinfection facilities, and the effluent outfall into the Columbia River. Piping would also be added for sludge recirculation from the clarifiers to the aeration basin and for waste sludge transport to the sludge treatment components.

10. **Electrical System**. A new and upgraded electrical system will be included. It appears that some components of the existing electrical system do not meet current codes and are of an age that replacement parts are not available, and additional units cannot be acquired for upgrade. Existing facilities which will remain in operation, as well as the new facilities, would be powered from the upgraded and new system.

11. **Instrumentation and Control System**. A new instrumentation and control system is needed to provide accurate metering and monitoring of the existing and new facilities. A computer-based distributed instrumentation and control system will make treatment more efficient, and will reduce operator time and requirements.

12. **Site Work, Demolition and Rehabilitation**. Inclusion of site work to accommodate the new facility, with some demolition to allow construction of new and improved facilities, and rehabilitation of the site for ease of future maintenance is planned. The costs developed for the system do not include complete demolition of existing structures which are not utilized or not in need of upgrade.

13. **New Laboratory and Operations Building**. The current laboratory facilities and administrative area is inadequate and in need of improvement or replacement. A new laboratory and operations building is included with the selected alternative. This building will include operator office space, restrooms, laboratory, and the instrumentation center.

14. **New Maintenance Building**. A new building, approximately 1,800 square feet in area, for maintenance of equipment, spare parts storage, and vehicle storage will be included.

15. **Sludge Hauling and Spreading Truck**. A truck for hauling and spreading the dewatered sludge will be purchased for transporting sludge from the site to a field for disposal, or to the planned composting plant in Stanfield.

Table 6-6 shows the estimated cost for the Wastewater Treatment Facility, and Table 6-7 shows the cost estimate for the outfall to the Columbia River.

Environmental Consequences of the Preferred Alternative.

As discussed in Chapter 5, implementation of the oxidation ditch alternative will result in the continued discharge of treated effluent to the Columbia River. Water quality impacts of the discharge will be controlled by efficient BOD and TSS removal, the substitution of UV disinfection equipment for chlorine, outfall improvements to increase effluent dilution and dispersion, and utilization of modern, cost-effective equipment.

Improvements constructed under the preferred alternative will be compatible with Oregon land use laws and goals. The treatment facility will remain in an area zoned for "Community Service" activities, which includes the service of wastewater treatment and disposal. The City of Umatilla maintains planning authority within the City Limits, and has determined that the project is an allowable use at the proposed site. Therefore, a land use compatibility statement is not required for this project.

Current investigations regarding environmental, cultural, archeological, or historical aspects of sites that may be purchased for use in the construction of new collection and treatment facilities are presently underway. USDA Rural Development is assisting the City of Umatilla with several aspects of this investigation. In addition, the City will be obtaining the services of an outside consultant, and/or the Confederated Tribes of the Umatilla Indian Reservation, to complete an archeological survey of possible treatment facility sites. Results from all property investigations will be attached to this Study as an addendum before a final determination on environmental or special significance is reached.

OUTFALL TO RIVER IMPROVEMENTS

15" SOUTHWEST INTERCEPTOR IMPROVEMENTS

12" SOUTHWEST INTERCEPTOR IMPROVEMENTS

OXIDATION DITCH WASTEWATER TREATMENT FACILITY IMPROVEMENTS

24" McNARY INTERCEPTOR IMPROVEMENTS

18" McNARY INTERCEPTOR IMPROVEMENTS

15" McNARY INTERCEPTOR IMPROVEMENTS

SCALE: 1"=2000'

TWO RIVERS CORRECTIONAL INSTITUTE

JOHNS MANSVILLE

McNARY INDUSTRIAL PARK 8" FORCEMAIN IMPROVEMENTS

EXISTING 12" McNARY INTERCEPTOR

8" FORCEMAIN IMPROVEMENTS

SOUTHWEST LIFT STATION IMPROVEMENTS

McNARY INDUSTRIAL PARK LIFT STATION IMPROVEMENTS

GILROY FOODS

McNARY GOLF COURSE

anderson perry	CITY OF UMATILLA, OREGON WASTEWATER SYSTEM STUDY SELECTED IMPROVEMENTS	FIGURE **6-1**

COLUMBIA RIVER

24" Outfall to Columbia River

Convert Existing Tanks to Aerobic Digesters.

Future Dewatered Sludge Holding And Processing

Demo BioTower

Future Aerobic Digesters

Future Aeration Basins & Clarifiers

N-S Centerline Sec. 17 T5N R28E

New Aeration Basin & 2 New Clarifiers

300

SCALE 1" = 100'

"K" Street

"L" Street

"M" Street

Upgrade & Convert Existing Tanks to Aerobic Digesters.

Future Parking, Maintenance & Pipe Yard

Pump Station & Headworks

Sludge Dewatering Building

Lab & Operations Building

Maint. Building

Exist Chlorine Contact Tank

Existing Access Road

Vacated Switzler Ave.

302

301

Nugent Ave.

3rd Street

ESVELT ENVIRONMENTAL ENGINEERING
7605 East Hodin Drive., Spokane, WA 99212

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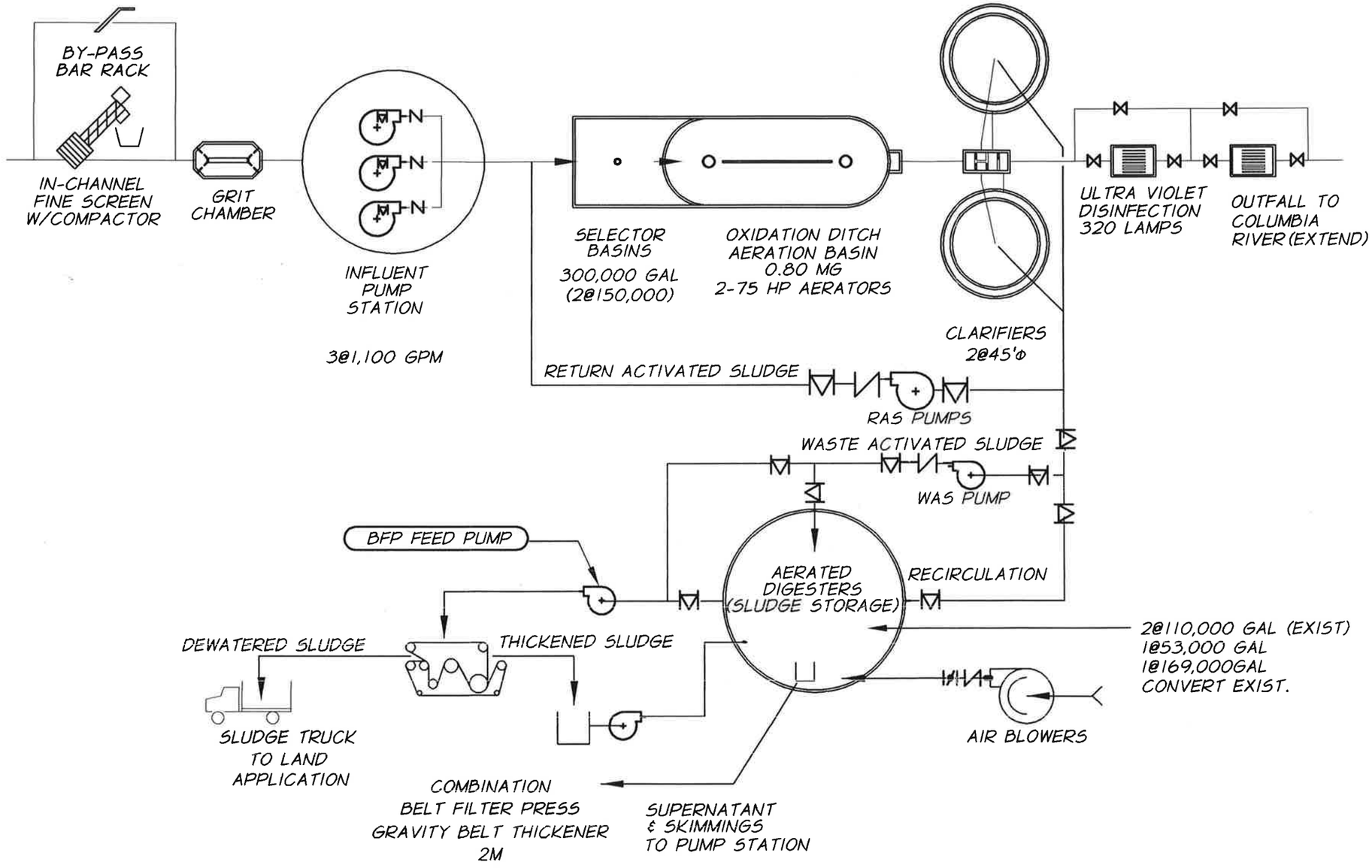
CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY

WASTEWATER TREATMENT FACILITY SITE PLAN

FIGURE
6-2



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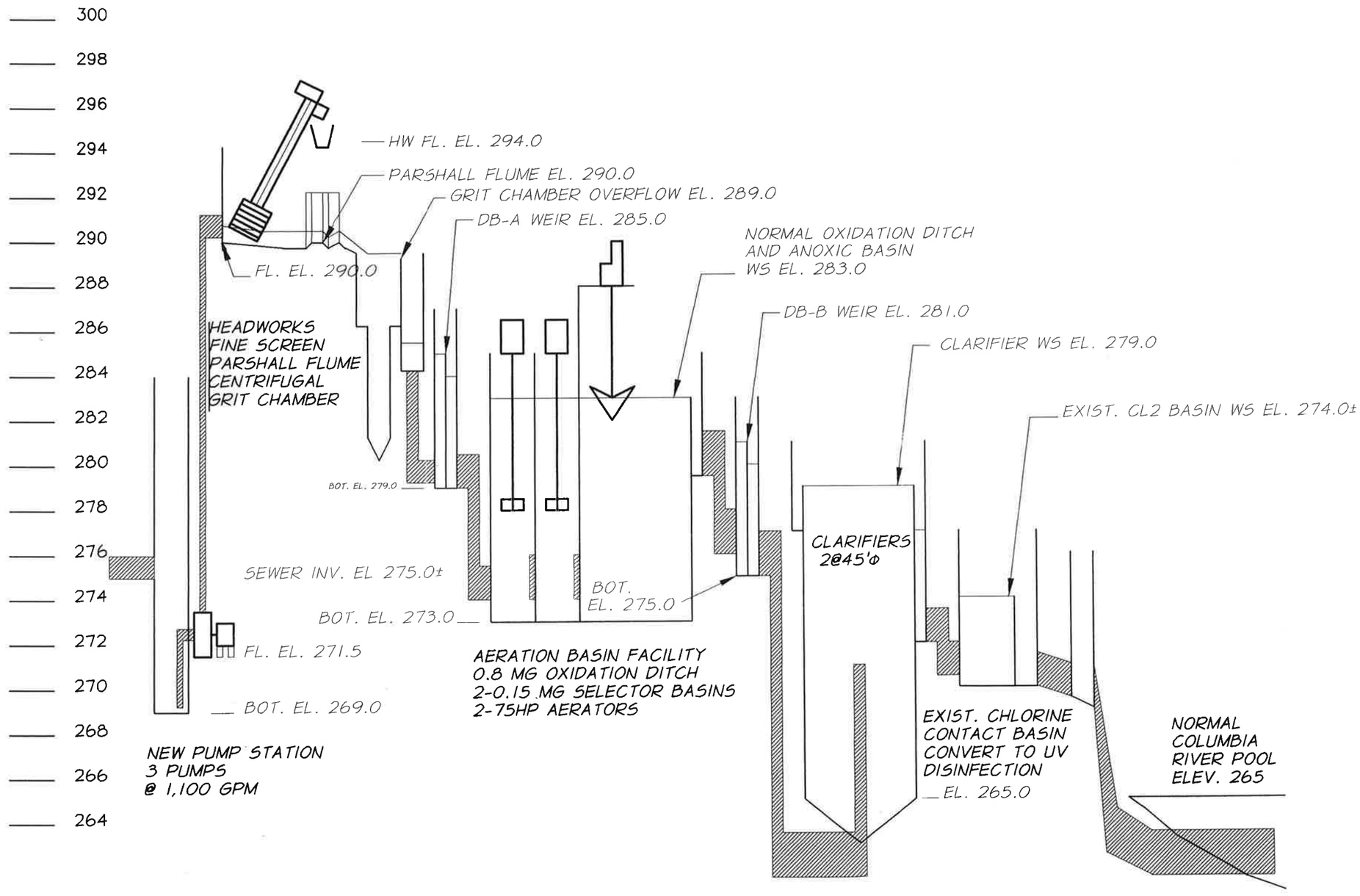
CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
SCHEMATIC FLOW DIAGRAM
TREATMENT FACILITY

FIGURE
6-3



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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY

WASTEWATER TREATMENT FACILITY
HYDRAULIC PROFILE

FIGURE
6-4

CITY OF UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
SELECTED IMPROVEMENTS

COST ESTIMATE SUMMARY

DESCRIPTION	*TOTAL ESTIMATED COST*
Southwest Umatilla Collection System Improvements	$ 608,000
New McNary Interceptor	1,679,000
New McNary Industrial Park Lift Station and Forcemain	366,000
New Oxidation Ditch Treatment Plant	8,565,000
Wastewater Treatment Plant Outfall Improvements	181,000
Total Estimated Project Cost	**$ 11,399,000**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
SELECTED IMPROVEMENTS
COST ESTIMATE SUMMARY

TABLE
6-1

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
SOUTHWEST UMATILLA COLLECTION SYSTEM IMPROVEMENTS
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	31,500.00	All Req'd	$ 31,500.00
2	Temporary Protection & Direction of Traffic/Project Safety	LS	20,000.00	All Req'd	20,000.00
3	12-inch Sewer Pipe	LF	25.00	2,150	53,800.00
4	15-inch Sewer Pipe	LF	27.00	2,000	54,000.00
5	Manholes	EA	1,800.00	14	25,200.00
6	Rock Excavation	CY	60.00	1,200	72,000.00
7	Asphalt Surface Restoration	SY	25.00	550	13,800.00
8	South Hill Lift Station Improvements	LS	100,000.00	All Req'd	100,000.00
9	8-inch River Crossing (Forcemain)	LF	100.00	750	75,000.00
10	Service Line Reconnections	LS	5,000.00	All Req'd	5,000.00
				Estimated Construction Costs	450,300.00
				Engineering, Contingency, Administration, Legal, 35%	157,600.00
				TOTAL ESTIMATED COST	**$ 607,900.00**

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
NEW McNARY INTERCEPTOR
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	84,500.00	All Req'd	$ 84,500.00
2	Temporary Protection & Direction of Traffic/Project Safety	LS	30,000.00	All Req'd	30,000.00
3	18-inch Sewer Pipe	LF	35.00	17,600	616,000.00
4	15-inch Sewer Pipe	LF	27.00	3,000	81,000.00
5	24-inch Sewer Pipe	LF	38.00	900	34,200.00
6	Manholes	EA	1,800.00	54	97,200.00
7	Rock Excavation	CY	60.00	4,400	264,000.00
				Estimated Construction Costs	1,206,900.00
				Engineering, Contingency, Administration, Legal, 35%	422,400.00
				Right-of-Way	50,000.00
				TOTAL ESTIMATED COST	**$ 1,679,300.00**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
NEW McNARY INTERCEPTOR
COST ESTIMATE

TABLE
6-3

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
NEW McNARY INDUSTRIAL PARK LIFT STATION & FORCEMAIN
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	19,000.00	All Req'd	$ 19,000.00
2	Lift Station	LS	150,000.00	All Req'd	150,000.00
3	8-inch Forcemain	LF	22.00	2,200	48,400.00
4	Rock Excavation	CY	60.00	900	54,000.00
				Estimated Construction Costs	271,400.00
				Engineering, Contingency, Administration, Legal, 35%	95,000.00
				TOTAL ESTIMATED COST	**$ 366,400.00**

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 2
OXIDATION DITCH TREATMENT PLANT
SYSTEM COMPONENTS

1. New Pump Station
   - 3.1 MGD - 3 pumps at 1,100 gpm
2. Preliminary Treatment
   - Mechanical Bar Screens
   - Flow Metering
   - Fine Screens
3. Aeration Basin
   - Oxidation Ditch - 0.8 MG, Selector - 0.27 MG
4. New Secondary Clarifiers
   - 2 at 45 feet diameter x 15 feet tanks
   - RAS/WAS Pump Station
5. New Disinfection System
   - 320 Lamp System within Existing Chlorine Contact Tanks
6. Sludge Storage Tanks
   - Convert Old Abandon Tanks and Existing Tanks
7. Sludge Dewatering
   - Belt Filter - 2 M, Polymer Feed, Conveyors
   - Building and Temporary Storage
8. Process and Yard Piping
9. Electrical
10. Instrumentation and Control
11. Site Work, Demolition, and Rehabilitation
12. New Laboratory and Operation Building
    - 2,400 SF Building
    - Laboratory Equipment and Furnishings
13. Maintenance Building
    - 1,800 SF building
14. Sludge Hauling and Application
    - 15 CY Sludge Truck
15. Land
    - 10 - 12 Acres (includes existing lease area)

CITY OF UMATILLA
WASTEWATER SYSTEM STUDY
ALTERNATIVE 2
OXIDATION DITCH TREATMENT PLANT
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	432,000.00	All Req'd	$ 432,000.00
2	New Pump Station	LS	400,000.00	All Req'd	400,000.00
3	Preliminary Treatment	LS	674,000.00	All Req'd	674,000.00
4	Aeration Basin	LS	792,000.00	All Req'd	792,000.00
5	New Secondary Clarifiers	LS	750,000.00	All Req'd	750,000.00
6	New Disinfection System	LS	358,000.00	All Req'd	358,000.00
7	Sludge Storage Tanks	LS	150,000.00	All Req'd	150,000.00
8	Sludge Dewatering	LS	612,000.00	All Req'd	612,000.00
9	Process and Yard Piping	LS	448,000.00	All Req'd	448,000.00
10	Electrical	LS	448,000.00	All Req'd	448,000.00
11	Instrumentation and Control	LS	287,000.00	All Req'd	287,000.00
12	Site Work, Demo, Rehabilitation	LS	287,000.00	All Req'd	287,000.00
13	New Laboratory and Operations Building	LS	410,000.00	All Req'd	410,000.00
14	Maintenance Building	LS	126,000.00	All Req'd	126,000.00
				Estimated Construction Costs	6,174,000.00
				Engineering, Contingency, Administration, Legal, 35%	2,161,000.00
				Equipment	130,000.00
				Land Acquisition	100,000.00
				TOTAL ESTIMATED COST	**$ 8,565,000.00**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ALT. 2 - OXIDATION DITCH TREATMENT
COST ESTIMATE

TABLE 6-6

CITY OF UMATILLA
OUTFALL PIPING IMPROVEMENTS
COST ESTIMATE

NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	TOTAL ESTIMATED PRICE
1	Mobilization/Demobilization	LS	9,400.00	All Req'd	$ 9,400.00
2	Outfall Piping	LF	500.00	250	125,000.00
				Estimated Construction Costs	134,400.00
				Engineering, Contingency, Administration, Legal, 35%	47,000.00
				TOTAL ESTIMATED COST	**$ 181,400.00**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
OUTFALL PIPING IMPROVEMENTS
COST ESTIMATE

TABLE
6-7

CHAPTER 7

FUNDING AND IMPLEMENTATION

GENERAL

This chapter of the Wastewater System Study outlines methods available for financing and implementing the improvement alternatives selected in Chapter 6. Financing alternatives available to the City for financing the City's portion of the project would include a combination of State and Federal grants and loans, and this chapter explores three separate options for developing the necessary funding of the project. None of these options include the Oregon Department of Correction's share of the improvements. The funding of the McNary Industrial Park share of the improvements is discussed separately. Because of the high cost of construction projects of this magnitude, financial resources must include both local low-interest funding and all available outside grant funding. This chapter will provide a recommended financing plan, including methods of implementing this plan, and a list of required steps for implementation of the project.

This chapter also provides a brief overview of the City's present wastewater system budget and current rate structure. Information on the majority of the available grant and loan programs is presented, with special attention given to those funding programs which are most attractive to the City of Umatilla for wastewater project funding. This chapter also presents a detailed implementation plan for both the design and construction of the needed improvements.

WASTEWATER SYSTEM BUDGET AND RATES

The annual cost of operating the present Umatilla wastewater system projected to the budget year 2000-2001 is shown in Table 7-1, entitled Budget Projections. System expenditures in Table 7-1 have been broken down into four broad categories. These categories include personal services, materials and services, capital outlay, and contingency. These costs have been projected to the year startup of the new facilities is expected to occur.

Costs associated with operating and maintaining wastewater systems are expected to continue to increase in the future, primarily because of increased regulatory requirements, increased wastewater testing requirements, and inflation. It is important that Umatilla have sufficient revenues to provide adequate monies for the operation, maintenance, and replacement for their wastewater system into the future. An adequate rate structure is key to ensuring that sufficient revenues are available to meet the City's future needs. The ability to protect Umatilla's investment in their wastewater treatment/collection system and to maintain sound operations depends on the system's financial stability. Without timely repairs and maintenance, the City's wastewater infrastructure would deteriorate until costly rehabilitative work or replacement would be necessary. The importance of operating the utility on a financially self-supporting basis, thus allowing for timely maintenance, cannot be overemphasized.

The City of Umatilla's current sewer rates are shown in Table 7-2. A rate study was completed by the City several years ago, and all users of the system are now charged on the basis of multiples of an "Equivalent Residential Unit" (ERU) projected to dispose of approximately 7,000 gallons per month of wastewater into the City's system. There are a total of approximately 1,322 residential users on the system, 70 small commercial users (132 ERUs), 9 large commercial users (174 ERUs), and 12 industrial/public users (79 ERUs). The total of all of these present system users in terms of Equivalent Dwelling Units is 1,707 ERUs. Refer to Table 7-3 for a list of commercial users. Gilroy Foods, Inc., whose vegetable dehydration plant at the McNary Industrial Park has been on standby for several years, is not included in this figure. Their contract for service with the City is currently being re-negotiated on a year-to-year, "capacity available", basis.

Many of the current State and Federal grant/loan funding programs have required communities to do a Comparative User Rate Analysis of their city's wastewater system rates compared with those of other communities within the region. In anticipation of this, a brief Comparative User Rate Analysis has been prepared for similar communities who have recently upgraded their wastewater facilities.

Several Oregon cities were contacted in order to determine their monthly residential sewer rate. The **residential** sewer rate was selected for comparative purposes because of the wide variation typically found in **non-residential** user rates. Additionally, in most Oregon communities, the revenue provided by residential users provides the vast majority of utility fund operating revenues. These rates do not reflect any debt payments for wastewater improvements that are being paid by taxes on real property or through systems development charges. The results of these contacts are shown below.

COMPARATIVE USER RATE ANALYSIS

City	Monthly Residential Sewer Rate
Cascade Locks	$32.50
Ontario	$28.08
Irrigon	$32.00
Stanfield	$19.00
Madras	$31.00
Condon	$21.88

The major factor affecting most communities' sewer rates is how recently the community had made major improvements to their system. For example, a city currently meeting all requirements of their wastewater operating permit, and not being required to expend costs for planning, design, or construction of improvements, would typically have a lower rate ($15 to $20 per month) than a city just completing a major system-wide improvement project. What stage a city is at in this process is very important when comparing Umatilla's projected rates to rates in surrounding communities.

COST SHARE FOR USERS

As described in Chapters 3, 4 and 5, three user groups exist within the City, including the City of Umatilla, the Two Rivers Correctional Institute, and the McNary Industrial Park. The City of Umatilla includes residential, commercial, and small industrial users. The Two Rivers Correctional Institute is the new facility currently being constructed in the McNary Industrial Park by the Oregon Department of Corrections. The industrial sector is large industry within the McNary Industrial Park. Cost shares of the project have been allocated to these three user groups in accordance with factors developed in previous chapters of this study. Referring to Table 7-4, which reflects these cost shares, the Southwest Umatilla Collection System Improvements will be solely the City of Umatilla's responsibility. The cost of the new McNary Interceptor Improvements will be funded through the Department of Corrections and the McNary Industrial Park. The new McNary Industrial Park Lift Station and Forcemain Improvement cost will be funded by the McNary Industrial Park users. Both the Wastewater Treatment Plant and Treatment Plant Outfall Improvement costs will be jointly funded by the City of Umatilla and the Department of Corrections.

The cost share for the new McNary Interceptor is based upon the Department of Corrections funding the majority of the improvement cost and the McNary Industrial Park funding the cost of increased sewer line sizing to have capacity for the Industrial Park. The cost share between the City of Umatilla and the Department of Corrections for the Wastewater Treatment Plant and Treatment Plant Outfall Improvements is based on percent average day loading from these two users, accounting for flow, BOD loading, and TSS loading as described in the City's adopted Sewer Rate Study. Using this criteria, the City's share is 69 percent of the cost, and the Department of Correction's share is 31 percent. These percentages are reflected in the cost shares shown in Table 7-4.

FUNDING STRATEGIES

Funding of large capital improvement projects for small communities is becoming increasingly difficult. The elimination of Federal EPA construction grants several years ago and the scarcity of other available grants is now placing a disproportionately high financial burden on small communities such as Umatilla. The challenge to these communities is to maintain financially self-sufficient utilities in the face of rising costs and increased regulations. Often, local governments are caught between stringent regulations, higher costs for utility service, and citizen opposition to increased user fees. As the following summary of available funding programs shows, even if significant grant dollars are obtained, it is likely that a large share of wastewater system improvement costs would ultimately be borne by the citizens of Umatilla.

There are a number of State and Federal grant and loan programs available to provide assistance on municipal improvement projects to communities such as Umatilla. These programs offer various levels of funding aimed at different types of projects and sizes of communities. These include programs administered by the Oregon Economic Development Department (OEDD), USDA Rural Development (RD) (formerly Farmers Home Administration), the U.S. Economic Development Administration (EDA), and the Oregon Department of Environmental Quality (DEQ). Some of these agencies provide

grant funding, and some of them also provide low interest loan funding for assisting small communities on Public Works Projects.

There have been recent developments in how funding agencies, particularly Federal funding agencies such as RD and the U.S. Economic Development Administration (EDA), select and prioritize projects for receipt of funding. The Northwest Economic Adjustment Initiative, through the State Community Economic Revitalization Team (known as the SCERT process), has established a process whereby individual counties are prioritizing potential projects on a local level prior to consideration by funding agencies. The City of Umatilla submitted a Project Notification form to the Greater Eastern Oregon Development Corporation, as a part of the local prioritization process, again in 1997. The City of Umatilla's Wastewater Improvement Project received the second highest rating of Public Works Projects in Umatilla County during this second SCERT prioritization. Because some of the funding programs identified for a funding package will use the SCERT process to identify projects for funding (RD and EDA), it will be critical that the City of Umatilla continue to actively participate in the local prioritization process and actively educate people in these agencies about the importance of their project.

Rural Development. A key funding source for the City of Umatilla for this project will be the U.S. Department of Agriculture, Rural Development, (RD). This agency provides financial assistance to communities through both loans and direct grants. Under the loan program, the agency purchases the local bonds at rates that are usually slightly lower than market rates. The interest rate for these bonds is dependent on the median household income (MHI) of the community and other factors, and varies from year to year, based on other economic factors nationally. Loans from this agency are made to communities at one of the following approximate rates:

1. Market Rate 5.50%: This rate is paid by those applicants whose MHI of the service area is more than the $27,756 Oregon non-metropolitan median household income.

2. Intermediate Rate 5.0%: This rate will be paid by those applicants whose median household income (MHI) of the service area is $27,756 (Oregon's non-metropolitan median household income) or less.

3. Poverty Line Rate of 4.500%: This rate will be paid by those applicants whose median household income (MHI) of the service area is: (a) below $22,205 (80% percent of the Statewide non-metropolitan median household income) AND (b) the project (water and wastewater only) is needed to meet regulatory agency health and sanitary standards.

The agency is currently in the fourth year of increased funding availability because of the U.S. Department of Agriculture's "Rural Timber Initiative". They presently require communities to establish equivalent monthly residential user rates in the range of $30 to $35 per month before the community qualifies for grant funds from the agency. One of the major benefits of the RD loan program is that the agency can purchase either revenue or general obligation bonds. These bonds must be for a period of 40 years.

The City of Umatilla's median household income is $20,799, and the City's wastewater project is needed to meet regulatory agency standards. Consequently, the City of Umatilla qualifies for the present poverty line loan interest rate of 4.5 percent. The City also scored highly in Umatilla County's recent SCERT prioritization process, receiving a second place rating. A high rating in this process is also an agency requirement for funding eligibility. The RD grant/loan program, together with other available funding programs, appears to offer the most attractive funding package for a project of this magnitude, and will be an important source of funding for this project. The City is in the process of completing a final application for funding under this program.

OEDD - Community Development Block Grant Program. The Oregon Economic Development Department (OEDD) is responsible for administering the Community Development Block Grant (CDBG) Program. Funding for this program is provided on an annual basis by the U.S. Department of Housing and Urban Development (HUD). There is an estimated $15 million proposed to be available for the non-metropolitan areas of Oregon in 1998 through this program. Some $4.95 million (33 percent) of this funding is targeted for public works water and sewer projects statewide. Grant funds are available up to an aggregate maximum of $750,000 for planning, design, and construction of facilities. Applications are accepted year-round.

The agency requires a project to be needed to help resolve a community's current water quality compliance issues for a public works project to be eligible for funding under this program. Because of the City's past and present sludge disposal problems, coupled with their recent Notice of Permit Violation, and the current Mutual Agreement and Order (MAO) process the City is now going through with the DEQ, Umatilla will have no problem fully complying with this eligibility requirement. Another requirement for receiving grant funding from this program is that a city must have a percentage of low-to-moderate income people greater than 51 percent. The City of Umatilla performed an income survey that has documented a low-to-moderate income percentage of 57.2 percent. Therefore, the City is fully eligible for grant funding from this program, having met both of these eligibility requirements. The City has already met with representatives of the OEDD and other agencies at a "one-stop" meeting in Salem last year, and discussed the City's need for funding under the CDBG Program.

After applications are received by Oregon Economic Development Department, each application is evaluated. During the evaluation process, the agency considers factors such as the ability of the community to fund the project locally, the urgency of the community's need, how much support for the program is received from state regulatory agencies, other grant and loan programs which would be affected by the agency's funding of the project, the cost and grant dollars per person benefited by the project, how well the project is targeted toward meeting the national objective of primarily benefiting persons of low and moderate income, and the City's existing utility rate structure. The City of Umatilla has had a great deal of experience with this program, having recently received monies for water system improvements. It is interesting to note that, because of efficiencies achieved on the City's earlier water project, they were able to return a substantial portion of the CDBG dollars to the agency for use on other projects.

The implementation plan discussed in later sections of this chapter will require a substantial amount of grant funding. The Community Development Block Grant Program,

in combination with other funding programs identified in this chapter, must be considered as an essential source of grant funds for this project. The program allows up to three open CDBG projects at one time. This funding program will be an important source of grant funds for the City. The City is in the public hearing process of this program and will most likely submit an application for funding under this program after the DEQ's review and approval of this Study.

State Revolving Fund Loan Program. The State Revolving Fund (SRF) Loan Program is administered by the Oregon Department of Environmental Quality (DEQ) and provides low interest rate loans to public agencies for the planning, design and construction of water pollution control facilities (e.g. wastewater treatment plants), as well as for some publicly-owned estuary management and non-point source control projects. Priority in the agency's ranking process is always given to projects addressing documented water quality problems and health hazards.

In December 1992, rule changes were approved that established interest rates on all design and/or construction loans of 2/3 of the current municipal bond rate during the quarter that the loan agreement is signed. Facility planning loans have a variable interest rate (currently 2.8%) with repayment in five years or less. This study is being funded with loan funds from that program. Loans for design and construction currently have an interest rate of about 3.8% with repayment over 20 years. In addition, fees are being assessed to cover program administration costs by the Department. A loan processing fee of 1.5% is included in the loan amount, and a servicing fee of 0.5% of the outstanding balance is added to the 3.8% current interest rate, resulting in a net interest rate under that program of about 4.3% assessed annually. The City has applied for funding under this program and is currently listed as fifth in the State to receive loan funding. This program is an excellent source of loan funds to provide the City's local share of funding for an improvement project.

OEDD - Special Public Works Program. The Oregon Economic Development Department (OEDD) also administers the Special Public Works Program, which is also funded by monies from the Oregon Lottery. Loan and grant funds have been available through this program for Public Utility Improvements. Grants and loans can be made available to communities for the purpose of improving public facilities in order to enable the community to be in a position to serve additional commercial and industrial business within the community. The availability of these funds is tied very closely to the need for economic growth, the creation of jobs, and capacity building needed for future jobs. Unless a project can be tied directly to the creation of new jobs, or the retention of existing jobs, a community will not be in a very competitive position under this program, with the limited funds that are available.

Other funding programs discussed in this section appear to be more attractive for the City of Umatilla's portion of this project. Recent legislative cuts in the OEDD's budget have made grant funds available through this program almost non-existent. However, loan funds are available, with the cost of the bond sale absorbed by the program. This program is an attractive source of loan funds for the McNary Industrial Park portion of this project because of the low cost of selling the revenue bonds and competitive interest rates.

OEDD - Water/Wastewater Financing Program. The OEDD also administers the Water/Wastewater Financing Program. This program was established by the State Legislature to help municipalities make improvements to their drinking water and wastewater systems. The funding normally available through this program for 1998/99 has been targeted toward providing the State's matching funds for the new Safe Drinking Water Revolving Loan funds. Because of this fact, future funds will probably be directed more toward water system projects than wastewater projects.

The intent of the legislation was to provide funding to municipalities to assist them in complying with the Safe Drinking Water Act and the Clean Water Act. Project eligibility is limited to those projects that are needed to ensure compliance with drinking water quality standards administered by the Oregon State Health Division or water quality statutes, rules, orders, or permits administered by the DEQ. This program is funded by monies provided through the Oregon State Lottery, and funding can be in the form of grants and/or loans. The determination of the final amount of financing available for a specific project, and the grant/loan mix is based on several factors including the financial strength of the municipality, per capita income of the applicant, existing utility rates as compared to a statewide average, and other factors. Generally, grants and loans are provided on a 50/50 basis. The maximum amount of grant funds available is $500,000.

The City is eligible for funding from this program. This Water/Wastewater Program should be considered as an extremely remote backup source of grant funds during the process of establishing a funding package for the recommended improvements.

U.S. Economic Development Administration. The U.S. Economic Development Administration (EDA) has grant and loan funds available for public works projects that can be shown to be needed to maintain or build the capacity necessary to attract new and keep existing industry. Monies are also available to fund projects which stimulate the economy of a community. The goal of the program is to create or retain jobs. This agency has invested money for several projects in Eastern Oregon during the past few years to fund Public Works Improvement Projects in communities where new industries were locating, or planning to locate in the future. In addition, the agency has a program, the Public Works Impact Program (PWIP), that can fund projects in areas with extremely high rates of unemployment. This program is targeted toward creating additional local construction jobs during the construction of the needed improvements, thus reducing the unemployment rate in the area. This agency is a potential source of grant funding for the new McNary Interceptor, and the new McNary Industrial Park Lift Station and Forcemain. The City has received a tentative letter of commitment from the EDA for these portions of the project.

GENERAL COMMENTS

The method of financing the City's share of the cost associated with the required improvements to the City's wastewater system must be determined before improvements can be made to the system. Financing of public improvement projects, particularly on a project of this magnitude, is a complex problem that must be resolved before the project can move forward beyond the planning stage. The cost of providing local financing for the needed wastewater system improvements can be very high, particularly when major improvements are needed. These high costs can often exceed the financial capability of local businesses and residents. Obtaining assistance through State and Federal grants

and low interest loans is imperative in order to be able to provide the necessary financing of major wastewater system improvement projects while maintaining reasonable rates to the customers.

A heavy financial burden would be imposed on the citizens of Umatilla if the cost of the needed improvements were to be financed completely through loans by the City of Umatilla, even if low interest loans were available. The possibility of obtaining a 100 percent grant to construct the necessary improvements is extremely remote. A combination of both local bonds through low interest loans, and direct grants appears to be the most feasible approach for the City of Umatilla to develop the funds necessary for the financing of this project.

FUNDING PACKAGES

The City's portion of the wastewater improvement project would include a new sewer pump station and interceptor to handle expected growth in Southwest Umatilla, the City's share of a new "Oxidation Ditch" type wastewater treatment facility capable of handling a population of 6,000 people, and an outfall line extension into the Umatilla River. The DOC and industries in the McNary Industrial Park would be responsible for the entire cost on the new McNary Interceptor, and the industries would pay for the cost of the new McNary Lift Station and Forcemain.

Financing Option 1. The total estimated City share of the project as shown in Table 7-4 is $6,650,000. Under this first option, the project would be financed by a $5,000,000 Rural Development (RD) loan at 4.5 percent interest for 40 years, and both a $1,000,000 Rural Development grant and a $650,000 Community Development Block Grant (CDBG). The total yearly bond repayment would be $271,700 per year, and the average residential equivalent sewer user rate would be $30 per month ($360 per year). To qualify for this funding, the City would need the authority to sell revenue bonds by mid-February 1998.

General Comments, Financing Option 1. This is the last year of a 4-year program of the Northwest Timber Initiative that the Rural Development Agency has $45,000,000 in grant and loan monies available for water/wastewater projects in Oregon. Next year, the agency's budget should be about $16,000,000, and there is a high probability that projects will not be considered by the agency at that time that would exceed 25 percent of that budget. Therefore, if Umatilla does not receive funding under this program this year, the City would not be eligible for funding of such a large project under this agency's program next year. On November 4, 1997, a number of Oregon communities received voter approval and will be receiving $35,000,000 of these RD funds, leaving the remaining $10,000,000 in grant/loan funds "up for grabs".

These other remaining RD grant/loan funds are being sought by at least 10 Oregon communities pending the outcome of other bond issues on March 10, 1998. If the City of Umatilla is going to utilize the funds available through this program, they must receive the authority to sell bonds by mid-February in order to have a good chance of receiving these remaining funds. If the City's authority to sell bonds is remanded to the voters in May, it is most likely that Rural Development's remaining $10,000,000 in grant/loan funds will go

to other projects who receive their voters authority to deal with RD prior to the May election.

Financing Option 2. The strategy for financing the project under this second option would be to borrow money directly through the Oregon Department of Environmental Quality's State Revolving Fund (SRF) loan program. The SRF loan would be for $5,900,000, coupled with a $750,000 Community Development Block Grant. The SRF program does not require voter approval, and the loan can be made by direct motion of the Council. The effective interest rate is slightly below 4.5 percent on a 20-year bond. The yearly debt repayment would be approximately $453,600, requiring an equivalent residential user rate of approximately $39 per month ($468 per year).

General Comments, Financing Option 2. This is the only wastewater funding program that does not require the approval of the general citizenry to raise the needed financing for the project. Because the financing "package" would result in higher monthly user rates, this should be the second choice of the City, but the program constitutes a "safety net" in the event the City becomes ineligible for grant/loan funding through the Rural Development Program and grant funding through the CDBG Program. Because of the City's recent permit violations, Umatilla has an excellent chance of receiving loan funding under this grant and loan program.

Financing Option 3. In the event that the City is unable to receive grant funding through the Community Development Block Grant Program needed to keep user rates at $30 per month as outlined in Financing Option 1, the third financing option would be similar to Option 1, with a loan to replace the Community Development Block Grant, and higher user rates. Under this option, the project would be financed by a $5,000,000 Rural Development (RD) loan at 4.5% interest for 40 years, and a $1,000,000 Rural Development grant. The remaining $650,000 would be financed through a State Revolving Fund (SRF) loan for $650,000. This SRF loan could be obtained by a direct motion of the Council. The rate is slightly below 4.5% on a 20-year bond. The total yearly bond repayment would be $321,700 per year, and the average residential equivalent sewer user rate would be $32.50 per month ($390 per year). The City has an excellent chance of receiving this SRF loan, if needed.

General Comments, Financing Option 3. The City has more than adequate evidence to support the need for a Community Development Block Grant, which is not growth related, not prison related, and not industry related. However, timing of the City's CDBG application and more projects statewide than funds available statewide may mean a shortage of Community Development Block Grant funds. Over time, however, the City should be able to qualify. An application should be submitted for Design Engineering under the CDBG Program as soon as the DEQ has approved this study. If design funds are not available, the City could then borrow from the SRF on the short-term to be able to begin the design work on the project, and resubmit a grant application under the CDBG Program for Construction Engineering after the project Contract Documents are complete. If the City fails in this second attempt to obtain the Community Development Block Grant funds to repay the SRF loan, the $32.50 monthly rate could be imposed on the community, and the financing would remain in place for completion of the project.

Financing the Industrial Share. It is beyond the scope of this financing section to discuss in detail options for financing the oversizing of the new McNary Interceptor and the new McNary Industrial Park Lift Station and Forcemain. EDA funds have been offered to cover approximately 60 percent of these costs, and OEDD Special Public Works Loan Funds should be available to make up the remaining funding needed to complete this portion of the project. Other grant funds are currently being sought by the City to help reduce this loan, but the remaining yearly cost of the loan repayment should be borne by the users within the McNary Industrial Park themselves. Short-term operating income that the City obtains from Gilroy Foods, who is planning to start up their Dehydration Plant on a year-to-year basis, could also be used to reduce this debt.

IMPLEMENTATION PLAN

Actions Required. Implementation of this project will require several actions by the City Council, the Oregon Department of Environmental Quality, the Oregon Department of Corrections, and other State and Federal regulatory and funding agencies. Following are some of the key actions now required:

- Publish and present the Wastewater Facilities Plan to the City Council. This was completed on January 20, 1998.

- Advertise for a public hearing for citizen input on this Wastewater Facilities Plan. The public hearing will be held on February 17, 1998.

- Present copies of the Wastewater Facilities Plan to the Oregon Department of Environmental Quality, the Oregon Department of Corrections, the Oregon Economic Development Department, USDA Rural Development, the U.S. Economic Development Administration, and other agencies for review and comment. This has been done.

- Hold a public hearing and take citizen input on the Wastewater Facilities Plan. Meet with representatives of the Oregon Department of Environmental Quality and these other agencies to take comments and discuss the final plan.

- Following the analysis and consideration of statements taken at the public hearing and through the DEQ and other agencies' review, the City Council will provide the Engineer with any appropriate modifications to the plan and direct its completion.

- During this process, the City must closely coordinate the project with the Oregon State Department of Corrections. The DOC will be greatly affected by the planning, construction, and funding of the project.

- Submit final funding applications to the Oregon Economic Development Department through the Community Development Block Grant Program, the U.S. Department of Agriculture through the Rural Development Water/Wastewater Program, the Oregon State Department of Environmental

Quality through the Clean Water State Revolving Fund Program, and the U.S. Economic Development Administration Community Facilities Program.

- Provide assistance as necessary to the Oregon State Department of Environmental Quality in the preparation and review for a new NPDES Permit for the City. If this Facilities Plan is adopted as drafted, this permit will involve a mass load increase for future waste discharges into the Columbia River.

- Assist the Rural Development staff and other agencies with the preparation and Environmental Assessment of the proposed project. This document will then be circulated by the DEQ to other State and Federal agencies and other interested parties for review and comment.

- Maintain close liaison with the Oregon State Department of Environmental Quality staff throughout the planning, design, permitting, and construction of this project.

IMPLEMENTATION SCHEDULE

The following implementation schedule is prepared to assist in moving the project to completion. Tasks which have been completed have been removed from the schedule.

Tasks	Date of Completion
Publish Final Draft of Wastewater Facilities Plan	January 1998
Submit Applications for Grant/Loan Funding under Rural Development, CDBG, and USEDA Programs	January 1998
Hold Public Hearings and Meetings with DEQ and Other Agencies for Comments on the Plan	February 1998
Publish Final Wastewater Facilities Plan	February 1998
Agreement for Design and Construction Engineering Approved	March 1998
Additional Land for Treatment Plant Expansion and Pipeline Easements/ROW Acquired	April/June 1998
Site Mapping and Data Collection Completed	April/June 1998
Complete Construction Documents	February 1999
Award Construction Contract(s)	May 1999
Complete Construction, Project Start-up	September 2000

CITY OF UMATILLA, OREGON
BUDGET PROJECTIONS, WASTEWATER SYSTEM

Item	Adopted Budget Amount (1997-98)	Budget After Project Completion (1997 dollars)	*Budget Amount - Year 2000 - 2001
Personnel Services			
Regular Earnings	$108,196	$130,948	$147,298
Overtime Earnings	$3,900	$4,900	$5,512
Extra Help		$0	$0
FICA	$8,277	$10,018	$11,269
Health	$12,032	$14,912	$16,774
Retirement	$13,373	$16,185	$18,206
Workers Compensation	$2,500	$3,000	$3,375
Life	$211	$263	$296
Unemployment Tax	$108	$131	$147
Disability Insurance	$533	$644	$724
Subtotal	**$149,130**	**$181,001**	**$203,601**
Materials and Services			
City Attorney	$3,000	$3,500	$3,937
Wastewater Study	$55,000	$0	$0
Engineering	$2,000	$3,000	$3,375
Lab Tests	$4,500	$7,500	$8,436
Office Supplies	$2,500	$3,000	$3,375
Postage	$3,500	$4,000	$4,499
Telephone	$1,000	$1,500	$1,687
Training/Travel	$2,000	$6,000	$6,749
Insurance	$10,600	$16,000	$17,998
Uniform Allowance	$700	$1,100	$1,237
Refunds	$500	$750	$844
Gas/Oil	$3,500	$5,000	$5,624
Electricity	$24,000	$65,000	$73,116
Permits & Fees	$3,825	$10,000	$11,249
Certifications	$300	$800	$900
Building Maintenanace	$1,000	$2,000	$2,250
Equipment Operation	$7,000	$10,000	$11,249
Maintenanace Contracts	$1,000	$5,000	$5,624
UV Maintenance		$6,000	$6,749
Plant Maintenance	$15,500	$18,000	$20,247
Computer Support	$2,200	$3,000	$3,375
Subtotal	**$143,625**	**$171,150**	**192,520**
Capital Outlay			
Equipment	$1,000		
Sewer Inspection Camera	$8,000		
Subtotal	**$9,000**	**$0**	**$0**
Contingency	**$5,926**	**$0**	**$0**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
BUDGET PROJECTIONS
WASTEWATER SYSTEM

TABLE 7-1

Item	Adopted Budget Amount (1997-98)	Budget After Project Completion (1997 dollars)	Budget Amount - Year 2000 - 2001
Transfers			
Auto Equipment	$15,000	$15,000	$16,873
Computer Upgrade	$10,000	$10,000	$11,249
Sewer Improvements	$50,670	$0	$0
Sludge Drying Beds	$29,000	$0	$0
Lease Payments on City Hall	$14,500	$14,500	$16,310
Subtotal	**$119,170**	**$39,500**	**44,432**
Debt Service Payments			
Principal Payments	$0	$0	$0
Interest Payments	$1,197	$0	$0
Subtotal	**$1,197**	**$0**	**$0**
Reserves			
SRF Loan Reserve	$12,052	$0	$0
Unappropriated Fund Balance	$0	$0	$0
Subtotal	**$12,052**	**$0**	**$0**
Inflow/Infiltration	**$0**	**$15,500**	**$17,435**
Equipment Replacement Fund	**$0**	**$63,000**	**63,000**
TOTAL EXPENDITURES	**$440,100**	**$470,151**	**$520,988**

***at 4% Inflation Rate**
****Not Inflated**

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
BUDGET PROJECTIONS
WASTEWATER SYSTEM

TABLE 7-1
Cont'd

CITY OF
UMATILLA, OREGON
CURRENT SEWER RATES

Single Family Dwelling Unit	$ 15.55
Apartment/Duplex Unit without separate water meter	$ 13.00
Commercial and Hotel/Motel	
Minimum Charge (1st 7,000 gallons)	$ 15.55
Successive units of 7,000 gallons each or 3,500 or more of such unit	$ 15.55

Industrial - "Industrial User" shall mean any nongovernment, nonresidential user of the public treatment works which is identified in the Standard Industrial Classification Manual, 1972, Office of Management and Budget, as amended and supplemented, under the following division:

Division A - Agriculture, Forestry, and Fishing
Division B - Mining
Division D - Manufacturing
Division E - Transportation, Communication
Division I - Services

A user in these Divisions may be excluded form the industrial category if it is determined that it will introduce primarily domestic waste and waste from sanitary conveniences.

Minimum Charge (1st 7,000 gallons)	$ 15.55
Successive units of 7,000 gallons each or 3,500 gallons or more of such unit	$ 15.55

Each industrial user fee is to be negotiated as a separate contract with the City to recover the costs of any sewer treatment expansion that may be required to accommodate the industrial user. The cost recovery fee will be determined using the latest available EPA/DEQ guidelines.

Surcharge - For those users whose wastewater has a greater strength than normal domestic sewage, a surcharge in addition to the normal user charge, will be collected. The surcharge for operation and maintenance including replacement is:

Flow	=	50% of the O&M cost
Biochemical Oxygen Demand	=	30% of the O&M cost
Total Suspended Solids	=	20% of the O&M cost

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY

CURRENT SEWER RATES

TABLE 7-2

Enterprise zone discount

a. Enterprise zone for businesses qualified after July 5, 1994 (Ord. #620)

Year 1: Rate less 15%
Year 2: Rate less 10%
Year 3: Rate less 5%

Gilroy Foods, Inc. (Until November 15, 1994, per contract between City and ODI, dated November 20, 1989, and assumed by Haas Foods, Inc. on January 9, 1991, and assumed by Gilroy Foods on September 21, 1993.)

Outside the corporate limits of the City of Umatilla, the sewer use charge shall be two times the rate for the same sewer use inside the City Limits, except for industrial customers who will be charged as defined under Industrial Sewer Service Charge.

SEWER MISCELLANEOUS CHARGES

Delinquent Charges	$ 2.50 min. Or 10%
McFarland Addition sewer construction charge per lot incorporated Res. #13-90	$ 2.10 per month
Sewer hook-ons to City sewer (Ord. #534 & 560)	$300.00
Public Works Crew Labor Charge	$ 16.75 per hour
City equipment	ODOT Equipment Rental Rates

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY

CURRENT SEWER RATES

TABLE
7-2
Cont'd

CITY OF
UMATILLA, OREGON
LIST OF COMMERCIAL SEWER USERS

ACCOUNT DESCRIPTION	AVERAGE ERU'S	CURRENT SEWER RATE PER ERU	PROPOSED SEWER RATE PER ERU
COMMERCIAL SMALL **70 Users**			
Umatilla Chamber of Commerce	1	15.55	30.00
*Assembly of God	1	15.55	30.00
*Umatilla Presbyterian	1	15.55	30.00
*Baptist Church	1	15.55	30.00
*Umatilla Baptist	1	15.55	30.00
Charlie's Tavern	2	15.55	30.00
Ruth Stratton	1	15.55	30.00
US West	1	15.55	30.00
*Hermiston Oregon PM Group	1	15.55	30.00
Kenneth Peterson	1	15.55	30.00
Kenneth Peterson	1	15.55	30.00
Columbia Red Apple	1	15.55	30.00
P. Sherrell-Car Wash	7	15.55	30.00
Oregon Potato	5	15.55	30.00
South Basin Packing	1	15.55	30.00
Western Farm Service	1	15.55	30.00
Cenex Soil Service	1	15.55	30.00
LT's Engine Rebuild	1	15.55	30.00
E & V Investments	9	15.55	30.00
Sherdon Dietz	1	15.55	30.00
Charles White	1	15.55	30.00
Umatilla Head Start	1	15.55	30.00
Ivan Collar	1	15.55	30.00
*Umatilla Hospital	1	15.55	30.00
*Umatilla Hospital	1	15.55	30.00
Columbia Basin Cable	1	15.55	30.00
Inland Empire Bank	1	15.55	30.00
Inland Empire Bank	1	15.55	30.00
US Post Office	1	15.55	30.00
Mark Pengelly	1	15.55	30.00
Karla Stuck	1	15.55	30.00
Carlson's Drug	1	15.55	30.00
Wilbur Ellis	1	15.55	30.00
*Tuscan Lodge	1	15.55	30.00
*Port of Umatilla	3	15.55	30.00
Selectric	1	15.55	30.00
AM/PM Arco	7	15.55	30.00
Price-Less Gas	1	15.55	30.00
Alan Burks Custom Glass	1	15.55	30.00

ACCOUNT DESCRIPTION	AVERAGE ERU'S	CURRENT SEWER RATE PER ERU	PROPOSED SEWER RATE PER ERU
Sagebrush Antiques	1	15.55	30.00
Clyde & Betty Noble	1	15.55	30.00
Dallas Greensijh	1	15.55	30.00
Sandra Barrett	1	15.55	30.00
Ivan Collar	1	15.55	30.00
Agri-Check Inc.	7	15.55	30.00
Circle K	2	15.55	30.00
Photo Plus	1	15.55	30.00
Terrance Kinnaird	2	15.55	30.00
Leather Oil Co.	1	15.55	30.00
Robert Carr, DMD	1	15.55	30.00
G & S Chevron	3	15.55	30.00
*Umatilla Rural Fire Dept.	1	15.55	30.00
Allan Lambert	1	15.55	30.00
Buck's Corner, Inc.	1	15.55	30.00
Umatilla Auto Parts	1	15.55	30.00
Cris, Inc.	1	15.55	30.00
Nick's (Gary Muth)	2	15.55	30.00
*Port of Umatilla -RV Park	1	15.55	30.00
Clean Spot - Laundry	5	15.55	30.00
G & J Dairy Freeze	3	15.55	30.00
Hometown Video	3	15.55	30.00
McNary Market & Deli	1	15.55	30.00
Marcus Robins	7	15.55	30.00
Jeanne McMillan	1	15.55	30.00
Rest-A-Bit	1	15.55	30.00
Rest-A-Bit	9	15.55	30.00
Rest-A-Bit	2	15.55	30.00
Rest-A-Bit	2	15.55	30.00
*Port of Umatilla	1	15.55	30.00
Wildwood RV Park	1	15.55	30.00
Subtotal	**132**		
COMMERCIAL LARGE **9 Users**			
Tillicum Motor Inn	20	15.55	30.00
Heather Inn	35	15.55	30.00
Tillicum Motor Inn	21	15.55	30.00
Cross Roads	25	15.55	30.00
Chappy's	15	15.55	30.00
Bo Jac's	12	15.55	30.00
Edward Dufloth	17	15.55	30.00
Umatilla Trailer Crt	18	15.55	30.00
Umat. Speedwash-Ldry	11	15.55	30.00
Subtotal	**174**		

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
LIST OF COMMERCIAL SEWER USERS

TABLE 7-3 Cont'd

ACCOUNT DESCRIPTION	AVERAGE ERU'S	CURRENT SEWER RATE PER ERU	PROPOSED SEWER RATE PER ERU
INDUSTRIAL/PUBLIC SMALL 9 Users			
Boise Cascade	2	15.55	30.00
Boise Cascade	2	15.55	30.00
Boise Cascade	4	15.55	30.00
Boise Cascade	2	15.55	30.00
*Umatilla School Dist	2	15.55	30.00
*Umatilla School Dist	1	15.55	30.00
*Umatilla School Dist	1	15.55	30.00
*Umatilla School Dist	1	15.55	30.00
*Umatilla School Dist	1	15.55	30.00
Subtotal	**16**		
INDUSTRIAL/PUBLIC LARGE 3 Users			
*Umatilla School Dist	17	15.55	30.00
*Umatilla School Dist	20	15.55	30.00
JM Manufacturing	26	15.55	30.00
Subtotal	**63**		

* Indicates tax exempt user

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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
LIST OF COMMERCIAL SEWER USERS

TABLE 7-3 Cont'd

CITY OF UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
ESTIMATED PROJECT COST/SHARES

DESCRIPTION	TOTAL ESTIMATED COST	CITY OF UMATILLA SHARE	DEPARTMENT OF CORRECTIONS SHARE	MCNARY INDUSTRIAL PARK SHARE
Southwest Umatilla Collection System Improvements	$ 608,000	$ 608,000	$ -0-	$ -0-
New McNary Interceptor	1,679,000	-0-	1,499,000	180,000
New McNary Industrial Park Lift Station and Forcemain	366,000	-0-	-0-	366,000
Wastewater Treatment Plant Improvements	8,565,000	5,917,000	2,648,000	-0-
Wastewater Treatment Plant Outfall Improvements	181,000	125,000	56,000	-0-
TOTAL ESTIMATED PROJECT COST	**$ 11,399,000**	**$ 6,650,000**	**$ 4,203,000**	**$ 546,000**

APPENDIX A

PERMIT VIOLATIONS

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

EASTERN REGION

December 22, 1997

The Honorable George Hash
City of Umatilla
PO Box 130
Umatilla, OR 97882

Re: City of Umatilla
WQ-Umatilla County
NPDES# 101059, File# 90659

Dear Mayor Hash:

The Department mailed the City of Umatilla a draft Mutual Agreement and Order (MAO) addressing the City's biosolids compliance problems. December 16, 1997, I presented you, the City Council and interested residents, the history of events leading to the MAO, a description of the City's inability to consistently meet the biosolids land application standards, and the need for the MAO. So as not to occupy too much time at the meeting, I suspect that I may have failed to emphasize the importance of some other crucial items that I touched on in my discussion. Let me expand on these items. It is important to remember that these items are problematic regardless of the prison construction.

Collection system

The South Hill sewage lift station is currently operating at capacity and an upgrade is needed prior to any further development.

Sand and grit

- There is no sand and grit removal prior to influent reaching the plant. These materials can damage equipment (pumps and bearings) throughout the plant.
- These materials reduce the treatment capacity of the plant by reducing the volume of the various plant components.
- In order to remove sand and grit from a plant component, the flow must be diverted, the structure drained and the operators climb in to remove the material with a bucket and shovel. This is a tedious process and a significant loss of employee time, time that could be better spent on more productive City projects.
- Moreover, while the flow is diverted from a unit to be cleaned, influent continues to flow. Treatment, therefore, is reduced since the residence time in the alternate unit is shortened. This increases the likelihood of effluent violations.

Continued on next page

700 SE Emigrant
Suite 330
Pendleton, OR 97801
(541) 276-4063 Voice/TDD
FAX (541) 278-0168
DEQ/ER-101

Physical plant

- Due to its age physical deterioration of virtually all metal surfaces within the plant is occurring. Some examples are:
  - The floor in the raw lift building is a potential hazard
  - Electrical control panels are housed within the raw lift building. These panels and connecting conduit are subject to a corrosive atmosphere (H2S). Mechanical pump failures in the past have been attributed to faulty, corroded electronic components. Pump failures may result in a sewage spill.
  - Corrosion of the clarifier weirs can allow the passage of solids, increasing the likelihood of effluent violations
  - Corrosion of the clarifier drive mechanism supports can result in mechanical failure, bypassing the unit for repairs and possible resultant effluent violations
  - Corrosion of piping can result in equipment failure throughout the plant
- The biofilter media needs replacement. If not replaced soon, plugging and collapsing may occur within the tower. The reduced treatment will likely result in effluent violations.

Biosolids

- The existing biosolids handling process is insufficient to consistently meet treatment standards for land application.
- Several months ago I gave Chris Stensrud information on an alternate testing procedure to demonstrate compliance. The procedure measures the specific oxygen uptake rate (SOUR). Yesterday morning Chris informed me of the results of these tests. He said the plant can only meet the SOUR requirement approximately 50% of the time. This does not demonstrate compliance. The City still needs to modify its biosolids processing and examine possible dewatering procedures. Dewatering will decrease the volatile solids content of the biosolids end-product.
- Storage capacity within the digesters is limited. Weekly the operators shut down the aeration equipment in order to allow overnight settling within the basins. The following day supernatant is decanted and returned to the raw lift station for treatment. During the shut down anaerobic decomposition begins and H2S is generated. The City has received frequent complaints from residents and businesses downwind of the plant during these shut down periods.
- Moreover, a dewatering process will reduce the volume of biosolids and also reduce the number of trips employees make to land application sites.

Continued on next page

Discharge limitations	• As equipment failures materialize, the frequency of permit effluent violations may increase. The plant operators are limited by the equipment they are given to work with. • Chlorine and ammonia are toxic to aquatic organisms. During the permit renewal process effluent chlorine and ammonia will be evaluated and limits may be set for these parameters. This means that the City will need to evaluate a means to achieve compliance with these parameters.

As I mentioned during the December 16 meeting, many of the existing plant deficiencies go unnoticed to the observer. I attribute current compliance to the knowledge and high caliber performance of the treatment plant operators. The equipment will eventually fail. Now is the time to prepare a contingency plan for improvements to the facilities. Remember, funding sources are expected to diminish in the future. The time to act is now.

If you have any questions, please call me at 541-278-4623.

Sincerely,

Paul Daniello
Environmental Specialist

c Bonnie Parker, City of Umatilla
Shirley Frost, City of Umatilla
Mary Dedrick City of Umatilla
George Fenton, City of Umatilla
Floyd Mathews, City of Umatilla
Karla Stuck, City of Umatilla
Valerie Jorstad, City of Umatilla
Roger Francis, City of Umatilla
Chris Stensrud, City of Umatilla
Joni Hammond, DEQ-ER

Oregon

November 28, 1997

Bonnie Parker
City of Umatilla
PO Box 130
Umatilla, OR 97882

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

EASTERN REGION

Re: WQ-Umatilla County
NPDES# 101059, File# 90659
Discussion Draft MAO

Dear Ms. Parker:

I enclosed for your consideration a *discussion draft* Mutual Agreement and Order (MAO) concerning the City's inability to meet state and federal biosolids land application standards. When executed, past and future violations of the NPDES Permit outlined within the MAO will be settled without civil penalties until such time as modified or new facilities are constructed and operating. The MAO will specify a compliance schedule for developing a facilities plan, engineering plans and specifications, and constructing necessary modifications to Umatilla's wastewater treatment facilities. Violations of the MAO are subject to stipulated penalties.

To finalize the MAO the Department needs the City to provide the following information.

⇒ The Department needs realistic compliance dates for achieving the schedules outlined on page 2, lines 14 and 17.

⇒ The City needs to furnish a point of contact and telephone number for communications regarding this agreement. See page 4, lines 6 and 7.

I would appreciate that the City submit the requested information and any comments regarding this MAO to the Department's Pendleton office by **December 31, 1997.**

Please give me a call if you have any questions or wish to schedule a meeting to discuss the MAO. My telephone number is 541-278-4623.

Sincerely,

Paul Daniello
Environmental Specialist

c Roger Francis, City of Umatilla
Joni Hammond, DEQ-ER
Al Murrey, DEQ-ER, Ontario
Alan Schroeder, Anderson-Perry and Assoc.

700 SE Emigrant
Suite 330
Pendleton, OR 97801
(541) 276-4063 Voice/TDD
FAX (541) 278-0168
DEQ/ER-101

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

IN THE MATTER OF	) MUTUAL AGREEMENT
THE CITY OF UMATILLA,	) AND ORDER
	) No. WQ/M-ER-97-249
	) UMATILLA COUNTY
	)

WHEREAS:

1. On March 18, 1993, the Department of Environmental Quality (Department or DEQ) issued National Pollutant Discharge Elimination System (NPDES) Permit Number 101059 (Permit) to the City of Umatilla (City or Umatilla) pursuant to Oregon Revised Statutes (ORS) 468B.050. The Permit authorizes the City to construct, install, modify or operate wastewater treatment, control and disposal facilities. The permit also authorizes the City to discharge adequately treated water from a designated discharge point, in conformance with the requirements, limitations, and conditions set forth in the Permit. The Permit expires on December 31, 1997.

2. The Department issued Umatilla Notice of Noncompliance (NON) ERP-97-022 on May 1, 1997. The NON cited the City for violation of Oregon Administrative Rule (OAR) Chapter 340, Division 50, Section 026(2)(c) (herein referred to as Division 50). This rule requires compliance with the vector attraction reduction standards in the Code of Federal Regulations Title 40, Part 503 (40 CFR 503), Subpart D, Section 503.33 prior to the land application of biosolids.

3. The Permit was issued on March 18, 1993, prior to promulgation of 40 CFR 503. The Federal regulations, 40 CFR 503, were promulgated on March 22, 1993. In July 1995 the Department revised the Oregon biosolids rules in Division 50 to incorporate the provisions of 40 CFR 503 including the federal vector attraction reduction standards. The Department has been delegated by the United States Environmental Protection Agency state-wide authority to execute the NPDES permit program. The Department is not currently delegated with the authority to administer the biosolids

program associated with NPDES permits, therefore, the City is obligated to comply with the federal standards. The City applied for NPDES Permit renewal August 11, 1997. When the renewed Permit is issued, it will require the City to meet the existing federal biosolids standards as incorporated into Division 50.

4. DEQ and the City recognize that until the City upgrades its biosolids handling facilities, the City will continue to violate Division 50, and will violate the new Permit when issued.

5. The Department and Umatilla also recognize that the Environmental Quality Commission has the power to impose a civil penalty and to issue an abatement order for violations of conditions of the Permit. Therefore, pursuant to ORS 183.415(5), the Department and Umatilla wish to settle those past violations referred to in Paragraphs 2. Additionally, the Department and Umatilla wish to limit and resolve in advance the future violations referred to in Paragraph 4.

NOW THEREFORE, it is stipulated and agreed that:

6. The Environmental Quality Commission shall issue a final order:

a) Requiring Umatilla to comply with the following schedule and conditions:

i) By no later than **XXXX**, the City shall submit to the Department a wastewater study. This study shall include an evaluation of biosolids processing alternatives capable of complying with State and Federal standards;

ii) If the City elects to modify its biosolids processing facilities, then by no later than **XXXX**, the City shall submit to the Department for approval engineering plans and specifications for any proposed facilities upgrades;

iii) **Facilities upgrades must be completed within 2 years of the DEQ approval of the plans and specifications for the proposed wastewater system upgrade.**

b) Requiring the City to operate the existing facilities as efficiently as possible until completion of the upgrades referred to in Paragraph 6 a iii.

c) Requiring the City, upon receipt of a written notice from the Department for any violations of this MAO, to pay the following civil penalties: $250 for each day of each violation of any requirement or condition of this MAO.

7. This MAO does not exempt the City from compliance with any new or modified state or federal statutes or regulations that may be required in the future. The City and DEQ shall attempt in good faith to re-negotiate the MAO if new, previously unknown violations are determined or if, in the opinion of either the City and DEQ new state or federal statutes or regulations are promulgated that affect the City's ability to comply with this MAO.

8. This MAO is not intended to settle any violations not known by DEQ or any other violations not settled in this MAO. Furthermore, this MAO is not intended to limit, in any way, the DEQ's right to proceed against the City in any forum for any past or future violations not expressly settled herein.

9. The Department may amend the compliance schedule and conditions in this MAO upon finding that such modification is necessary because of changed circumstances or to protect public health and the environment. The Department shall provide Umatilla a minimum of thirty (30) days written notice prior to issuing an Amended Order modifying any compliance schedules or conditions. If the City contests the Amended Order, the applicable procedures for conduct of contested cases in such matters shall apply.

10. If any event occurs that is beyond Umatilla's reasonable control and that causes or may cause a delay or deviation in performance of the requirements of this MAO, Umatilla shall immediately notify the Department verbally of the cause of delay or deviation and its anticipated duration, the measures that have been or will be taken to prevent or minimize the delay or deviation, and the timetable by which Umatilla proposes to carry out such measures. Umatilla shall confirm in writing this information within five (5) working days of the onset of the event. It is Umatilla's responsibility in the written notification to demonstrate to the Department's satisfaction that the delay or deviation has been or will be caused by circumstances beyond the control and despite due diligence of Umatilla. If Umatilla so demonstrates, the Department shall extend times of performance of related activities under this MAO as appropriate. Circumstances or events beyond the City's control include, but are not limited to, acts of nature, unforeseen strikes, work stoppages, fires, explosion, riot, sabotage, or war. Increased cost of performance or consultant's failure to provide timely reports may not be considered circumstances beyond Umatilla's control.

11. Regarding the violations set forth in Paragraphs 2 and 4 above, which are expressly settled herein without penalty, Umatilla and the Department hereby waive any and all of their rights to any and all notices, hearings, judicial review, and to service of a copy of the final order herein. The Department reserves the right to enforce this order through appropriate administrative and judicial proceedings.

12. The terms of this MAO may be amended by the mutual agreement of the Department and Umatilla.

13. This MAO shall be binding on the parties and their respective successors, agents, and assigns. The undersigned representative of each party certifies that he or she is fully authorized to execute and bind such party to this MAO.

14. All reports, notices and other communications required under or relating to this MAO should be directed to Paul Daniello, DEQ Eastern Region Office, 700 SE Emigrant, #330, Pendleton, Oregon 97801; phone number 541-278-4623. The contact person for Umatilla shall be XXXXXX, City of Umatilla, Oregon 97882; phone number 541XXXXXXXX.

15. Umatilla acknowledges that it has actual notice of the contents and requirements of the MAO and that failure to fulfill any of the requirements hereof would constitute a violation of this MAO and subject Umatilla to payment of civil penalties pursuant to Paragraph 6c above.

16. Any stipulated civil penalty imposed pursuant to Paragraph 6c shall be due upon written demand. Stipulated civil penalties shall be paid by check or money order made payable to the "Oregon State Treasurer" and sent to: Business Office, Department of Environmental Quality, 811 SW Sixth Avenue, Portland, Oregon 97204. Within 21 days of receipt of a "Demand for Payment of Stipulated Civil Penalty" Notice from the Department, Umatilla may request a hearing to contest the Demand Notice. At any such hearing, the issue shall be limited to Umatilla's compliance or non-compliance with this MAO. The amount of each stipulated civil penalty for each violation and/or day of violation is established in advance by this MAO and shall not be a contestable issue.

17. Providing Umatilla has paid in full all stipulated civil penalties pursuant to Paragraph 16 above, this MAO shall terminate 60 days after Umatilla demonstrates full compliance with the requirements of the schedule set forth in Paragraph 6 above.

CITY OF UMATILLA

Date

Mayor George Hash
City of Umatilla

DEPARTMENT OF ENVIRONMENTAL QUALITY

DISCUSSION DRAFT

Date **Langdon Marsh, Director**
Department of Environmental Quality
Pursuant to OAR 340-11-136(1)

FINAL ORDER

IT IS SO ORDERED:

ENVIRONMENTAL QUALITY COMMISSION

Date **Langdon Marsh, Director**
Department of Environmental Quality
Pursuant to OAR 340-11-136(1)

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
2146 NE 4th Street, Suite 104
Bend, OR 97701
(541) 388-6146
Eastern Region
Bend Office

JUN 3 0 1997

CERTIFIED MAIL #Z 700 336 165

City of Umatilla
PO Box 130
Umatilla, OR 97882

Re: Notice of Permit Violation
No. WQ/M-ER-97-148
Umatilla County
Permit No. 101059

The City of Umatilla (City) operates its sewage disposal system, under National Pollutant Discharge Elimination System Waste Discharge Permit No. 101059. The Permit expires on 12/31/97. The City has regularly turned in its completed discharge monitoring reports to the Department, however, the City has not to date submitted an engineering evaluation due March 18, 1994. Either this evaluation, demonstrating the design average wet weather flow, or a request to retain the existing permit mass load limits, was due more than three years ago. The City also violated a total suspended solids (TSS) limit in the permit in October 1996.

Each of the violations is significant. Submission of the engineering evaluation is important, in the event that the City needs to request a mass load increase during the wet weather season. High levels of TSS can prevent effective disinfection, and can settle out and smother benthic organisms in public waters.

Because the City has violated conditions of its permit, I have enclosed a Notice of Permit Violation (NPV) which requires it to submit one of the following to the Department **within five (5) working days after receipt of the NPV:**

1. A written response acceptable to the Department certifying that the City is complying with all terms of the permit. The certification shall include a sufficient description of the information on which the City is certifying compliance to enable the Department to determine that compliance has been achieved; or

2. A written proposal, acceptable to the Department, to bring the City's facility into compliance with the permit. An acceptable proposal shall include at least the following:

   a) A detailed plan and time schedule for achieving compliance in the shortest practicable time;

   b) A description of the interim steps that will be taken to reduce the impact of the permit violation(s) until the City's facility is in compliance with the permit;

c) A statement that the City has reviewed all other conditions and limitations of the permit and no other violations of the permit were discovered. See Oregon Administrative Rule 340-12-040.

For the City's response to be acceptable to the Department, it should provide that the City will take steps to prevent further TSS violations, and submit either the needed engineering evaluation or a request to retain the City's existing permit mass load limits.

If the City fails to appropriately respond to the NPV within five days of receipt of the NPV, it will be subject to a civil penalty for the violations cited in Section III of the NPV. A copy of our OAR Chapter 340, Division 12, enforcement procedures and civil penalty rules, is enclosed, along with copies of cited statutes.

Finally, the City had a violation of Oregon Administrative Rules, in addition to the two permit violations cited in the NPV: The City land applied biosolids without meeting the vector attraction reduction standards set out in federal regulations. OAR 340-50-026(2)(c) and 40 Code of Federal Regulations (CFR) section 503.33 require that biosolids may only be land applied if the City meets the vector attraction reduction standards in 40 CFR 503.33. The application of biosolids at appropriate levels is important as biosolids are derived from the treatment of domestic wastewater, and insufficient treatment can attract rodents/vermin, birds, insects and other vectors, increasing the potential spread of human pathogens. It is the City's responsibility to apply its biosolids only as allowed by rule.

All submittals required by this NPV should be sent to Larry Cwik of the Department's Enforcement Section at 2020 SW Fourth Avenue, Fourth Floor, Portland, Oregon 97201-4987. If the City has any questions about this enforcement action, please contact Mr. Cwik at (503) 229-5728, or toll-free in Oregon at 1 (800) 452-4011, enforcement section extension 5728.

Sincerely,

Stephanie Hallock

Stephanie Hallock, Administrator
Eastern Region
Department of Environmental Quality

umatlt.doc
Enclosures
cc: Eastern Region, Bend Office, DEQ
Eastern Region, Pendleton Office, DEQ
Water Quality Division, DEQ
Department of Justice
Environmental Protection Agency

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

IN THE MATTER OF: CITY OF UMATILLA, Respondent.	))))	NOTICE OF PERMIT VIOLATION No. WQ/M-ER-97-148 UMATILLA COUNTY

I. AUTHORITY

This Notice of Permit Violation (Notice) is issued to Respondent, City of Umatilla, by the Department of Environmental Quality (Department) pursuant to Oregon Revised Statutes (ORS) 468.126 through 468.140, ORS Chapter 183 and Oregon Administrative Rules (OAR) Chapter 340, Divisions 11 and 12.

II. PERMIT

On March 18, 1993, the Department issued National Pollutant Discharge Elimination System Waste Discharge Permit No. 101059 (Permit) to Respondent. The Permit authorizes Respondent to construct, install, modify and operate a wastewater collection, control and disposal system and discharge adequately treated waste waters to public waters only in conformance with all the requirements, limits, and conditions set forth in the Permit. The Permit expires on December 31, 1997. The Permit was in effect at all material times.

III. PERMIT VIOLATIONS

1. From March 18, 1994 to the present, Respondent has violated Schedule C, Condition 2 of Respondent's Permit, and ORS 468B.025(2) in that Respondent failed to submit to the Department an engineering evaluation demonstrating the design average wet weather flow, or a request to retain the existing permit mass load limits, by March 18, 1994. This is a Class I violation pursuant to OAR 340-12-055(1)(d).

2. On October 23, 1996, Respondent violated Schedule A, Condition 1(a)(1), of Respondent's Permit, OAR 340-45-015(5)(b), and ORS 468B.025(2) in that Respondent violated a waste discharge limitation in Respondent's permit:

Respondent's waste had an effluent concentration of 43.5 milligrams per liter (mg/l) of total suspended solids (TSS), in excess of the permit limit of 30 mg/l for TSS. This is a Class II violation pursuant to OAR 340-12-055(2)(f).

IV. REQUIREMENTS UNDER THIS NOTICE

A penalty will be imposed for the violation(s) specified in Section III of this Notice unless the Respondent submits one of the following to the Department within five working days after receipt of this Notice:

1. A written response, signed by either a principal executive officer or appropriate elected official, from the Respondent certifying that the permitted facility is complying with all terms and conditions of the Permit. The certification shall include a sufficient description of the information on which the Respondent is certifying compliance so as to enable the Department to determine that compliance has been achieved; OR

2. A written proposal to bring the facility into compliance with the Permit which shall include at least the following:

a. A detailed plan and time schedule for achieving compliance in the shortest practicable time; and

b. A description of the interim steps that will be taken to reduce the impact of the Permit violation(s) until the permitted facility is in compliance with the Permit; and

c. A statement that the Respondent has reviewed all other conditions and limitations of the Permit and no other violations of the Permit were discovered.

V. CONSEQUENCES OF ADDITIONAL VIOLATIONS OR FAILURE TO RESPOND

If the Respondent fails to meet the requirements of Section IV of this Notice, or if the violation(s) cited in Section III continue, or if a Permit violation again occurs within 36 months of Respondent's receipt of this Notice, the Department may assess a civil penalty against Respondent. In the event that a civil penalty is imposed upon

Respondent, it will be assessed by a subsequent written notice pursuant to OAR Chapter 340, Division 12. Respondent will be given an opportunity for a contested case hearing to contest the allegations and penalty assessed in that Notice, pursuant to ORS 468.135, ORS Chapter 183, and OAR Chapter 340, Division 11. Respondent is not entitled to a contested case hearing at this time.

6-30-97
Date

Stephanie Hallock
Stephanie Hallock, Administrator
Eastern Region
Department of Environmental Quality

CITY OF UMATILLA

300 6th Street • P.O. Box 130 • Umatilla, OR 97882
(541) 922-3226 • Fax (541) 922-5758

July 7, 1997

Department of Environmental Quality
Enforcement Section
2020 SW Fourth Avenue, 4th Floor
Portland, OR 97201-4987

ATTN: Mr. Larry Cwik

RE: Notice of Permit Violation, No. WQ/M-ER-97-148
NPDES Permit No. 101059

Dear Mr. Cwik:

On July 2, 1997, the City of Umatilla received a Notice of Permit Violation (NPV) from the Department of Environmental Quality's (DEQ's) Eastern Region Administrator, Stephanie Hallock. The NPV addresses two violations of our sanitary wastewater system NPDES permit. Ms. Hallock's cover letter attached to the NPV also brings forward one violation of Oregon Administrative Rules arising from our biosolids land application program. Each specific issue raised in the NPV and cover letter is addressed below. More generally, we have reviewed our NPDES permit and operating records for the past 2 years and concluded that we are presently complying with all conditions and terms of the permit.

Wet Weather Mass Load Limits

Schedule C, Condition 2 of the NPDES permit required the City of Umatilla to either prepare an engineering evaluation demonstrating the design average wet weather flow capacity of our existing treatment facilities or request to retain existing wet weather mass load limits. At this time, we request to retain the existing wet weather mass load limits for biochemical oxygen demand and total suspended solids (TSS) as listed in the NPDES permit. Currently, we are in no danger of exceeding our wet weather mass load limits, so an engineering evaluation of wet weather conditions and a wet weather mass load increase for our existing facilities is not necessary.

However, as you may know, the State of Oregon is constructing a new medium-security prison in Umatilla. The new prison and anticipated residential and commercial growth within Umatilla will require the City to drastically expand existing facilities or build new facilities to meet future sanitary sewerage needs. The City will be requesting higher wet weather and dry weather mass load limits for new or expanded treatment facilities. We expect to request higher year-round mass load limits in our upcoming application to the DEQ for a new NPDES permit.

The City is presently preparing a wastewater facilities plan to address our future sewerage needs. As we develop the plan, we will be working with DEQ's Pendleton office to define new treatment requirements associated with any mass load increase that might be granted by the DEQ. However, we view any mass load increase request for expanded facilities as a separate issue from the wet weather, inflow and infiltration-related issue addressed by the Schedule C permit condition.

TSS Violation

Schedule A, Condition 1(a)(1) of the NPDES permit contains numeric discharge limitation for the City of Umatilla's treatment facility including concentration limits for TSS. In the fourth week of October 1996, our treatment facility was not able to comply with the weekly TSS limit of 30 mg/L. This violation occurred over a short period of time, and we were still able to meet the monthly average TSS limitation of 20 mg/L. We attribute the violation to an unusually large discharge of sediment from a local potato processing facility connected to our system. Since the violation occurred, we have been working with the facility to control the amount of dirt and mud that enters our sanitary sewerage system. This effort has proven successful, as we have experienced no additional TSS violations since the violation occurred.

Biosolids (Rule Violation)

Oregon Administrative Rules (OAR), Chapter 340, Division 50, and the Code of Federal Regulations (CFR) require that any biosolids land application program comply with recently defined pathogen reduction and vector attraction standards listed in the CFR. Although our existing permit does not contain specific vector attraction and pathogen reduction compliance conditions, the City of Umatilla has been working toward meeting these new biosolids, or sludge, requirements. In 1995, we arranged for an engineering evaluation of our sludge program and prepared a "Feasibility Study for Sludge Drying Beds" at our existing treatment plant site. The drying beds would have allowed us to meet the new Division 50 criteria. However, we were unable to secure new land necessary for the construction of the new beds.

Following this study, we turned our attention toward the possibility of using a belt filter press, complete with lime addition equipment, to dewater and treat our sludge prior to land application. We conducted pilot testing using a trailer-mounted belt filter press at our existing treatment facility. As part of our current wastewater facilities planning process, we are re-evaluating all sludge treatment possibilities, including the use of drying beds and/or a belt filter press. We expect to formulate our final sludge processing strategy as we complete our Wastewater Facilities Plan by the end of this year. We expect to meet all sludge treatment and disposal requirements once our new or expanded facilities are constructed.

However, until we decide on a future sludge strategy and are able to secure funds to construct any additional sludge treatment facilities, we will be unable to fully comply with OAR 340-50. Therefore, we request that the DEQ enter into a Mutual Agreement and Order with the City of Umatilla to formally recognize the planning, funding, design, and construction phases that will be necessary to meet Division 50 conditions. We propose the following schedule for achieving compliance with Oregon Administrative Rules and the CFR:

1.	Wastewater Facilities Planning	1997-1998
2.	Wastewater Facilities Design (contingent on funding)	1997-1998
3.	Wastewater Facilities Construction (contingent on funding)	1998-2000

Again, we have reviewed all other conditions and limitations contained in our NPDES permit and discovered no additional violations beyond those listed in the NPV. If you have any questions, please give me a call.

Sincerely,

Bonnie Parker
City Administrator

cc: Stephanie Hallock, DEQ Eastern Region Administrator
Joni Hammond DEQ Pendleton Office
Steve Anderson, Anderson Perry & Associates, Inc.
Alan Schroeder, Anderson Perry & Associates, Inc.

Hand

Oregon

July 18, 1997

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

ENFORCEMENT SECTION

Bonnie Parker
City Administrator
City of Umatilla
P.O. Box 130
Umatilla, OR 97882

Re: Notice of Permit Violation Response
No. WQ/M-ER-97-148
Umatilla County
Permit No. 10159

Dear Ms. Parker:

This is to confirm that we received your July 7, 1997, response to our Notice of Permit Violation and found your response acceptable.

We appreciate your response and look forward to the City's future compliance. However, we would like to caution you that subsequent violations which occur within the next 36 months may be subject to a civil penalty without the benefit of a warning.

The Department's Eastern Region, Pendleton, office will be in contact with you regarding your request to enter into a Mutual Agreement and Order to address your wastewater facilities planning, design, and construction.

If you have any questions, please contact Paul Daniello of the Department's Pendleton office at (541) 278-4623.

Sincerely,

Larry Cwik
Environmental Law Specialist
Enforcement Section

cc: Eastern Region, Pendleton Office, DEQ
Water Quality Division, DEQ
Stephanie Hallock, Administrator, Eastern Region
Enforcement Section, DEQ

2020 SW Fourth Ave
Suite 400
Portland, OR 97201-4
(503) 229-5528
TTY (503) 229-5471

APPENDIX B

EXISTING NPDES PERMIT

Permit Number: 101059
Expiration Date: 12/31/97
File Number: 90659

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM WASTE DISCHARGE PERMIT

Department of Environmental Quality
811 S.W Sixth Avenue, Portland, OR 97204
Telephone: (503) 229-5696

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:

City of Umatilla
P.O. Box 130
Umatilla, OR 97882

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated domestic sewage	001	RM 289.0

PLANT TYPE AND LOCATION:

Activated Bio Filter
Umatilla, Oregon

Treatment System Class: II
Collection System Class: II

RECEIVING SYSTEM INFORMATION:

Basin: Umatilla
Sub-Basin: Middle Columbia
Hydro Code: 10=-COLU 289.0 D
Receiving Stream: Columbia River
County: Umatilla

EPA REFERENCE NO: OR-002230-6

Issued in response to Application No. 997974 received May 9, 1991.

This permit is issued based on the land use findings in the permit record.

Michael Downs
Michael J. Downs, Administrator

MAR 18 1993
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate a waste water collection, treatment, control and disposal system and discharge to public waters adequately treated waste waters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

Unless authorized by another NPDES permit, each other direct and indirect discharge to public waters is prohibited.

SCHEDULE B

1. Minimum Monitoring and Reporting Requirements
(unless otherwise approved in writing by the Department)

a. Influent

Item or Parameter	Minimum Frequency	Type of Sample
BOD_5	Weekly	Composite (See note 1/)
TSS	Weekly	Composite (See note 1/)
pH	3/week	Grab

b. Outfall Number 001 (sewage treatment plant outfall)

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Measurement
Flow Meter Calibration	Annually	Verification
Quantity Chlorine Used	Daily	Measurement
Chlorine Residual	Daily	Grab
BOD_5	Weekly	Composite
TSS	Weekly	Composite
pH	3/week	Grab
Fecal Coliform	Weekly	Grab
Average Percent Removed (BOD_5 and TSS)	Monthly	Calculation

c. Sludge Management

Item or Parameter	Minimum Frequency	Type of Sample
Sludge Analysis including: Total Solids (% dry wt.) Volatile Solids (% dry wt.) Sludge Nitrogen NH_3-N; NO_3-N & TKN (% dry wt.) Sludge metals content for Pb; Zn; Cu; Ni; & Cd (mg/kg) Phosphorous (% dry wt.) Potassium (% dry wt.) pH (standard units)	Annually from each source	Composite sample to be representative of the product to be land applied from the digesters (See note 2/)

SCHEDULE C

Compliance Conditions and Schedules

1. Within 90 days of permit issuance, the permittee shall submit to the Department for review and approval a report that describes procedures for handling, transporting, and disposal of rags, grit, scum and screenings generated at the treatment facility. Upon written approval by the Department, the permittee shall conform with the approved procedures. Modified procedures may be followed upon prior approval in writing by the Department.

2. By no later than 12 months after permit issuance, the permittee shall submit either an engineering evaluation which demonstrates the design average wet weather flow, or a request to retain the existing mass load limits. The design average wet weather flow is defined as the average flow between November 1 and April 30 when the sewage treatment facility is projected to be at design capacity for that portion of the year. Upon acceptance by the Department of the design average wet weather flow determination, the permittee may request a permit modification to include higher winter mass loads based on the design average wet weather flow.

3. Within 180 days of permit modification to include higher winter mass load limits as specified in Condition 2 of this Schedule, the permittee shall submit to the Department for review and approval a proposed program and time schedule for identifying and reducing inflow. Within 60 days of receiving written Department comments, the permittee shall submit a final approvable program and time schedule. The program shall consist of the following:

   a. Identification of all overflow points and verification that sewer system overflows are not occurring up to a 24-hour, 5-year storm event or equivalent;

   b. Monitoring of all pump station overflow points;

   c. A program for identifying and removing all inflow sources into the permittees sewer system over which the permittee has legal control; and

   d. If the permittee does not have the necessary legal authority for all portions of the sewer system or treatment facility, a program and schedule for gaining legal authority to require inflow reduction and a program and schedule for removing inflow sources.

SCHEDULE D

Special Conditions

1. The permittee shall maintain on file at the facility a complete operation and maintenance manual.

2. An adequate contingency plan for prevention and handling of spills and unplanned discharges shall be in force at all times. A continuing program of employee orientation and education shall be maintained to ensure awareness of the necessity of good inplant control and quick and proper action in the event of a spill or accident.

3. All sludge shall be managed in accordance with the current sludge management plan approved by the Department of Environmental Quality. No substantial changes shall be made in sludge management activities which significantly differ from operations specified under the approved plan without the prior written approval of the Department.

   This permit may be modified to incorporate any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Clean Water Act, if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or controls a pollutant or practice not limited in this permit.

4. The permittee shall comply with Oregon Administrative Rules (OAR), Chapter 340, Division 49, "Regulations Pertaining To Certification of Wastewater System Operator Personnel" and accordingly:

   a. The permittee shall have its wastewater system supervised by one or more operators who are certified in a classification and grade level (equal to or greater) that corresponds with the classification (collection and/or treatment) of the system to be supervised as specified on page one of this permit.

Note: A "supervisor" is defined as the person exercising authority for establishing and executing the specific practice and procedures of operating the system in accordance with the policies of the permittee and requirements of the waste discharge permit. "Supervise" means responsible for the technical operation of a system, which may affect its performance or the quality of the effluent produced. Supervisors are not required to be on-site at all times.

NPDES GENERAL CONDITIONS

SECTION A. STANDARD CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468.720 and is grounds for enforcement action; for permit termination, suspension, or modification; or for denial of a permit renewal application.

2. Penalties for Violations of Permit Conditions

Oregon Law (ORS 468.140) allows the Director to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit.

In addition, Oregon Law (ORS 468.990) classifies a willful or negligent violation of the terms of a permit or failure to get a permit as a misdemeanor and a person convicted thereof shall be punishable by a fine of not more than $25,000 or by imprisonment for not more than one year, or by both. Each day of violation constitutes a separate offense.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, the permittee shall correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application shall be submitted at least 180 days before the expiration date of this permit.

The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions

This permit may be modified, suspended, revoked and reissued, or terminated for cause including, but not limited to, the following:

necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Bypass of Treatment Facilities

a. Definitions

(1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not include nonuse of singular or multiple units or processes of a treatment works when the nonuse is insignificant to the quality and/or quantity of the effluent produced by the treatment works. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.

(1) Bypass is prohibited unless:

(a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The permittee submitted notices and requests as required under paragraph c of this section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects and any alternatives to

5. Treatment of Single Operational Event

For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without an NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definitions

(1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.

(3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

b. Prohibition of overflows. Overflows are prohibited unless:

(1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage; and

(2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and

(3) The overflows are the result of an upset as defined in Condition B4 and meeting all requirements of this condition.

c. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

4. Penalties of Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years or both.

5. Reporting of Monitoring Results

Monitoring results shall be summarized each month on a Discharge Monitoring Report form approved by the Department. The reports shall be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. For a pollutant parameter that may be sampled more than once per day (e.g., Total Chlorine Residual), only the average daily value shall be recorded unless otherwise specified in this permit.

7. Averaging of Measurements

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean, except for bacteria which shall be averaged based on a geometric or log mean.

8. Retention of Records

The permittee shall retain records of all monitoring information, including all calibration and maintenance records of all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

9. Records Contents

Records of monitoring information shall include:

3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit shall be transferred to a third party without prior written approval from the Director. The permittee shall notify the Department when a transfer of property interest takes place.

4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. Twenty-Four Hour Reporting

The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally (by telephone) within 24 hours from the time the permittee becomes aware of the circumstances. During normal business hours, the Department's Regional office shall be called. Outside of normal business hours, the Department shall be contacted at 1-800-452-0311 (Oregon Accident Response System). A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

e. Public notification steps taken, pursuant to General Condition B-7.

The following shall be included as information which must be reported within 24 hours under this paragraph:

a. Any unanticipated bypass which exceeds any effluent limitation in this permit.

b. Any upset which exceeds any effluent limitation in the permit.

10. Changes to Indirect Dischargers - **[Applicable to Publicly Owned Treatment Works (POTW) only]**

The permittee must provide adequate notice to the Department of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and;

b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For the purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

1. BOD means five-day biochemical oxygen demand.

2. TSS means total suspended solids (non-filterable residue).

3. Mg/l means milligrams per liter.

4. Kg means kilograms.

5. M^3/d means cubic meters per day.

6. MGD means million gallons per day.

7. Composite sample means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.

8. FC means fecal coliform bacteria.

9. Technology based permit effluent limitations means technology-based treatment requirements as defined in 40 CFR 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-41.

10. CBOD means five day carbonaceous biochemical oxygen demand.

11. Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.

12. Quarter means January through March, April through June, July through September, or October through December.

APPENDIX C

CORPS OF ENGINEERS REPORT

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

EASTERN REGION

January 31, 1995

Bonnie Parker
City of Umatilla
P.O. Box 130
Umatilla, Oregon 97882

Re: Umatilla Wastewater Treatment Facility
Proposed Outfall Modifications
to Compensate for John Day Pool Drawdowns

Dear Ms. Parker:

On January 20, 1995 we received a draft Design Report from the Corps of Engineers regarding the City of Umatilla's wastewater treatment facility outfall into the Columbia River. The Corps proposes to extend Umatilla's outfall pipe in anticipation of a John Day Pool drawdown to elevation 257 (msl). Our comments on the proposal are outlined below. Overall, the recommended "replacement" proposal is acceptable. The City should consider using this opportunity to verify that mixing zone characteristics will be consistent with the City's discharge permit. A little extra work on the City's part could reduce mixing zone study costs that may be incurred at a later date, when the City is required to verify mixing zone characteristics.

- Per Oregon Administrative Rule (OAR) 340-52, plans and specifications for the outfall extension must be submitted to the Department in advance of construction. We are predominantly interested in the design of the pipe outlet, final river bottom contours near the pipe outlet, and available elevation head from the wastewater treatment plant to the outfall. Please be sure I receive a copy of the pre-bid construction documents.

- The City's current permit establishes a 50-foot mixing zone around the outfall outlet. However, the actual mixing zone has not been verified. Using information from the plans, effluent flow records, effluent chlorine levels, and some estimated river characteristics (e.g., river velocity, assumed effective mixing width) the City and DEQ can estimate whether the City's new outfall will be able to satisfy mixing zone limitations.

  During a subsequent permit cycle we will ask the City to investigate outfall conditions, and if problems exist, the City may need to modify the outfall. Why not discuss outfall design now? If we find that a minor modification or two would improve mixing, it would be cheaper for the City to deal with this now than modifying the in-place structure later.

700 SE Emigrant
Suite 330
Pendleton, OR 97801
(503) 276-4063 Voice/TDD
FAX (503) 278-0168

- The current proposal appears to provide for an outfall that is equivalent or better than the existing outfall. Similar materials and construction techniques will be utilized. The extension will ensure that the pipe is covered by at least three feet of water when the reservoir is at the minimum operating level. Water depth over the existing outfall can be less than three feet. Generally we would like to have the outfall a little deeper, as deeper outfalls provide for more consistent mixing than near-surface discharges that may be influenced by wind. However, since this is a replacement project I assume the Corps cannot be expected to extend the outfall further into the river.

Please contact me at 278-4606 if you have any questions, or if the City's would like to discuss a mixing zone investigation. I will be out of the office February 6-10, but will be in all of the following week.

Sincerely,

A. T. Schroeder

Alan T. Schroeder, P.E.
Senior Engineer

ATS

cc: Steven Stockton Corps of Engineers; PO Box 2946; Portland, OR 97208-2946
Roger Francis City of Umatilla; PO Box 130; Umatilla, OR 97882
Chris Stensrud City of Umatilla; PO Box 130; Umatilla, OR 97882
David Mann, DEQ-WQ
Jim Van Domelen, DEQ-NWR

FILE: UMATILLA STP
WQ - UMATILLA COUNTY

DEPARTMENT OF THE ARMY
PORTLAND DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2946
PORTLAND, OREGON 97208-2946

Reply to
Attention of:

17 January 1995

Civil and Environmental Design Section

Alan Schroeder, P.E.
Oregon State Department of Environmental Quality
Eastern Regional Office
700 SE Emigrant Street, Suite 330
Pendleton, Oregon 97801

Dear Mr. Schroeder:

We have enclosed our draft Design Report concerning our proposed modifications to the City of Umatilla, Sewage Treatment Plant Outfall for your review and comment.

This Design Report is one result of the continuing studies related to the proposed drawdown of the John Day Reservoir for improved fish survival. We have been in contact with the City's Public Works Supervisor, prior to our completion of this draft Design Report.

Please review the enclosed Design Report and provide us with your comments no later than 9 February 1995.

If you have any questions, please feel free to contact John Kranda by telephone at (503) 326-7162 or Jerry Gardenhire at (503) 326-3439.

Sincerely,

FOR Steven L. Stockton, P.E.
Chief, Planning and Engineering Division

Enclosure

DESIGN REPORT

UTILITY MODIFICATIONS FOR PROPOSED DRAWDOWN

OF THE

JOHN DAY RESERVOIR

1. Purpose. As a part of the on-going studies to decrease juvenile fish mortality in the Columbia River and the John Day Pool specifically, it has been proposed to lower the pool level from its "normal" elevation of approximately 264 feet mean sea level (msl) to the minimum operating pool (MOP) elevation of 257 feet msl. The pool drawdown will in theory increase water velocity in the pool, decreasing transit time for the fish, thereby decreasing fish mortality. In the Reconnaissance Report (Phase I), two utilities along and/or crossing the reservoir were thought to be impacted by the proposed drawdown: the city of Umatilla (Oregon) Sewage Treatment Plant (STP) Outfall and the Northwest Pipeline Corporation (NWPC) twin natural gas pipes near Irrigon, Oregon. As a result of the study culminating in this Letter Report, only the STP outfall will be affected. The NWPC and their geotechnical consultant conducted a study of their pipelines. The consultant prepared a report (Appendix A) discussing the drawdown impacts and concluded that given a drawdown rate of one (1) foot per day, there would be no impacts to the pipelines. The purpose of this letter report is to discuss and evaluate different methods of modifying the remaining affected utility to allow it to continue to operate and to propose the best option for implementation.

2. Authorization. The John Day Lock and Dam was originally authorized in the Flood Control Act of May 17, 1950, PL 516 and subsequently modified in 1956 and 1958 to change the volume of flood storage capacity and to include acquisition of land for a wildlife refuge. On October 2, 1992, the 102nd Congress passed PL 102-377, the Energy and Water Development Appropriations Act of 1993. This act provided for advance planning and design for mitigation efforts to enhance native fish stocks in the Columbia and Snake Rivers. Specifically, this act directed the Corps of Engineers (COE) to begin advance planning and design for drawdown of the John Day Pool to MOP. As a result of the act, the Columbia River Salmon Mitigation Analysis System Configuration Study phase I, Appendix B, John Day Reservoir Minimum Operating Pool, Draft Technical Report, April 1994, was prepared in response to the Northwest Power Planning Council, Columbia River Fish and Wildlife Program.

3. Background. Anadromous fish survival in the Columbia and Snake Rivers has been very poor over the last few years. As a means to rebuild native fish stocks in the two rivers, a plan was proposed that would, in theory, increase water particle velocity, thereby decreasing the passage time for juvenile fish going

Final

downstream to the ocean. The theory continues that if the juvenile fish move faster through the reservoir, there would be less time for predation in the river, resulting in more fish surviving to return to spawn in the Columbia and Snake Rivers. The mechanism proposed to increase water particle velocity is the drawdown of the reservoir behind John Day Dam to MOP (elevation 257 feet msl) during juvenile fish migration times. Two drawdown periods are being studied: 12 month (or permanent) drawdown and four month (or from approximately April to August). Drawing down the pool to MOP will impact all users of the pool to varying degrees. During preparation of the Phase I MOP Technical Report, a study of the existing utilities along and across the Columbia River and its major tributaries, was undertaken. Electrical, telephone, natural gas, and sanitary sewer owners were interviewed by telephone to determine if their systems would be impacted. Out of the 21 utility owners interviewed, only two would be directly impacted by the proposed drawdown. Potential sanitary sewer impacts were determined from telephone interviews with both Oregon Department of Environmental Quality (DEQ) and Washington Department of Ecology (WDOE) to see which systems had NPDES permits with the Columbia River as a receiving water. Only one system, the city of Umatilla's, would be impacted. See Figure 1 for the Location and Vicinity Maps.

4. <u>City of Umatilla Sewage Treatment Plant (STP) Outfall</u>. The outfall pipe carries treated sewage from the STP out to the Columbia River. The STP is approximately 300 feet south of the outfall. The outfall pipe is ductile iron, approximately 24 inches in diameter with a pile of approximately 6 inch (minus) rock covering the end of the pipe. The pipe is encased in concrete. With the pool elevation at approximately 264 msl, a water depth over the outfall pipe was measured to be approximately 2 feet, resulting in a river bottom elevation of approximately 262 feet msl. The apparent outfall was approximately 15 feet north of the Oregon shore. The resulting bottom slope is 1 on 7.5. The material surrounding the site is river gravels/cobbles. According to the city's Public Works point of contact, when the pool level is 263 feet msl, there is a resulting "dry beach" of approximately 10 feet, that the treated sewage must cross to enter the river. At this point, the city must contact DEQ and must sign the area as "Off Limits" to prevent public contact. According to the city's NPDES permit from DEQ: "The allowable mixing zone shall consist of that portion of the Columbia River within a radius of 50 feet from the point of discharge." Given the approximate river bottom slope, approximate river bottom elevation at the outfall, and a pool elevation of 257 msl (MOP), there would be a "beach" of approximately 40 feet for the treated sewage to cross to reach the river. Therefore, the drawdown would put the city out of compliance with their NPDES permit.

5. Utility Modifications Alternatives Considered. Three alternatives to mitigate for the lowered pool level were considered: excavate a ditch to contain the effluent from the existing outfall to the new pool level, extend the outfall pipe from the existing location out into the new pool, and no action. These proposed alternatives are intended to restore the mixing zone required by the city's NPDES permit, by moving it back out into the reservoir at pool elevation of 257 feet msl.

a. Alternative 1 - Ditch. The ditch alternative would contain the effluent, but would require signing and fencing to prevent the public from contact with the effluent, would require annual sediment removal (for non-MOP operational periods), and wouldn't put the entrance point for the effluent underwater. Since it is exposed to the air during the MOP operation period, smell would also be a problem. The fencing and signs would be partially covered by the pool during the non-MOP operation period, leading to corrosion, vandalism, and presenting an obstruction to recreational boating traffic during non-MOP operations. This alternative would not be allowed by the DEQ due to the open air nature of the ditch, therefore, the ditch alternative was rejected and will not be considered further.

b. Alternative 2 - Outfall Pipe Extension. This alternative would extend the existing outfall pipe farther out into the reservoir. The pipe would be installed in a trench and then backfilled. Neither sign nor fencing would be required for this alternative. The effluent would be completely contained inside the pipe extension, removing the problems of public contact and smell. Upon reaching the new pool, this alternative would place the new opening underwater (just like the existing outfall), making mixing in the river more complete. This alternative would restore the effluent mixing zone and is acceptable to all parties involved, therefore, this is the alternative described below. See Figure 2 for details and Enclosure 2 for a detailed cost estimate of this alternative.

c. Alternative 3 - No Action. This alternative would leave the outfall alone, leaving the effluent to flow across the "beach" to the new pool level. It would leave the responsibility of meeting the NPDES permit requirements for a mixing zone to the city. Since it does not solve the problem, our actions would damage a public entity, and our relocation authorities allow relocation of a public entity's facility if damaged by our actions, this alternative was rejected and will not be considered further. The cost to the Government for this alternative is $0.

6. Selected Alternative. The selected alternative, for mitigating impacts of the lowered reservoir level to MOP, is extension of the outfall pipe. See Figure 2 for details relating to this alternative.

a. Design Criteria. The pipe extension will be ductile iron pipe, Thickness Class 50, 24 inches in diameter, with bell and spigot joints with gaskets. The pipe will be encased in concrete to match the existing pipe installation. Above the top of the concrete encasement, the trench will be filled with trench excavation materials and compacted. The trench will be twice the pipe diameter, or 48 inches wide. The construction area will be temporarily dewatered during construction and the outfall's flow diverted into a temporary bypass pipeline of 24 inch diameter, bell and spigot PVC piping. The PVC piping will be connected to a temporary diversion valve installed upstream of the existing end of the pipe. Upon completion of the pipe extension, the new end of the pipe will be covered by a pile of rock, consisting of particles approximately 6 inches in diameter. The pile will be approximately 48 inches in diameter and the finished height will be approximately 1 foot. At the completion of construction, the dewatering dike will be removed.

b. Coordination with the city of Umatilla. Telephone interviews have been conducted with personnel from the city's public works department and an on-site meeting was held with the city's point of contact to discuss the requirements that the city might have. The city will be given an opportunity to review both this letter report and, if construction is authorized, the plans and specifications. Close coordination will be held during the preconstruction and construction periods to ensure no stoppages in sewage flows.

7. Cost Estimate. Estimated costs for the utility modification are shown below (a detailed cost breakdown is displayed in Appendix B). Costs below are rounded off to closest $1,000.

Construction Items 1 & 2:	Dewatering	$ 58,000
Construction Item 3:	Install bypass pipe	$ 15,000
Construct. Items 4,5,& 6:	Install pipe extension	$ 22,000
Construction Item 7:	Restoration	$ 16,000
Construction Item 8:	Mob./Demob.	$ 1,000
Contractor's Overhead, Profit, Risk, and Bond		$ 45,000
Construction Total		$157,000
E & D		$ 82,000
S & A		$ 54,000
As-Built Drawings (2% of E & D)		$ 2,000
Project Subtotal		$295,000
Contingencies (@ 15%)		$ 44,000
PROJECT TOTAL		**$339,000**

(December 1994 price level. No inflation costs are included.)

8. Schedule. It is expected that the utility modification work will take one (1) month to complete the STP outfall extension. An overall schedule for the utility modification contract is listed below:

Letter Report Preparation Start	22 July	1994
Letter Report Technical Review (by CENPP & City)	3 January	1995
Letter Report Incorporation into Drawdown Evaluation Report	3 January	1996
Plans and Specifications Preparation	14 April	1997
Construction Contract Advertise/Award	16 February	1998
Construction Start	1 December	1998
Construction	28 February	1999

9. Recommendation. We recommend approval of the proposed utility modification and approval to proceed with plans and specifications.

Project Location

PROJECT LOCATION MAP

NWPC Pipeline Location

STP Outfall Project

Sewage Treatment Plant (STP)

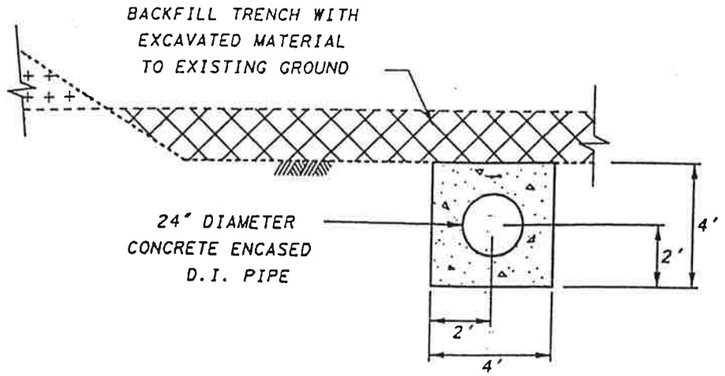
Outfall

VICINITY MAP

Scale in Feet

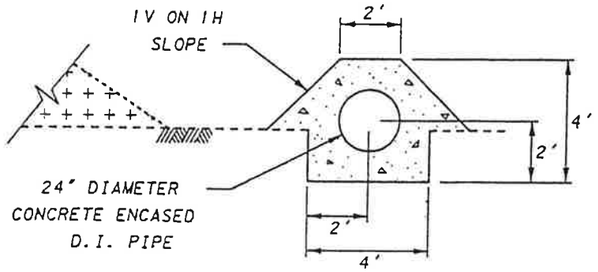
0 1000 2000 3000

Figure 1



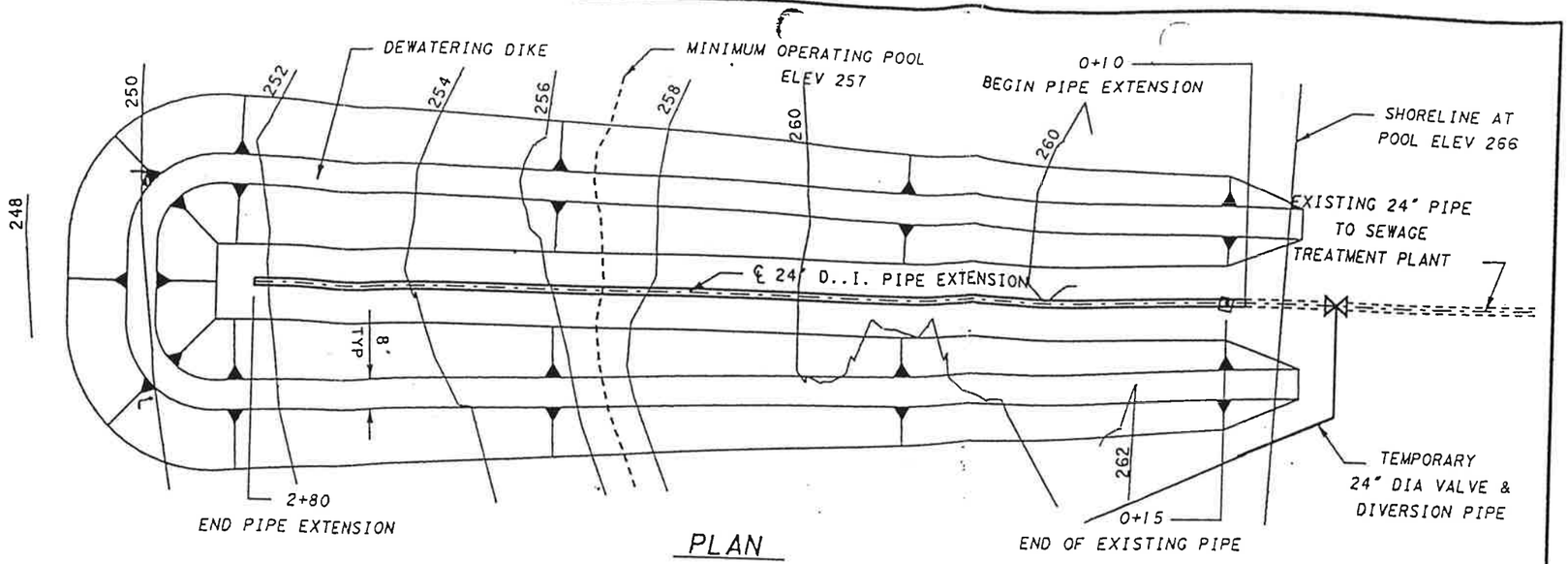
TYPICAL TRENCH SECTION IN FULL CUT

SCALE: 1"=5'



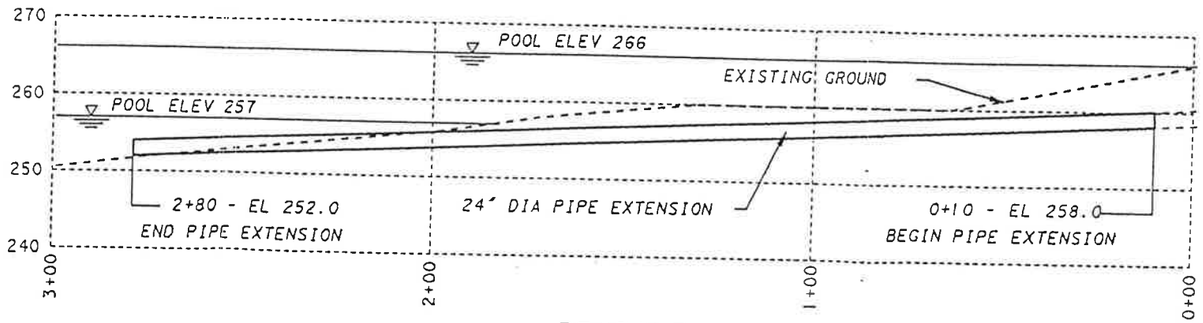
TYPICAL TRENCH SECTION IN PARTICAL CUT

SCALE: 1"=5'



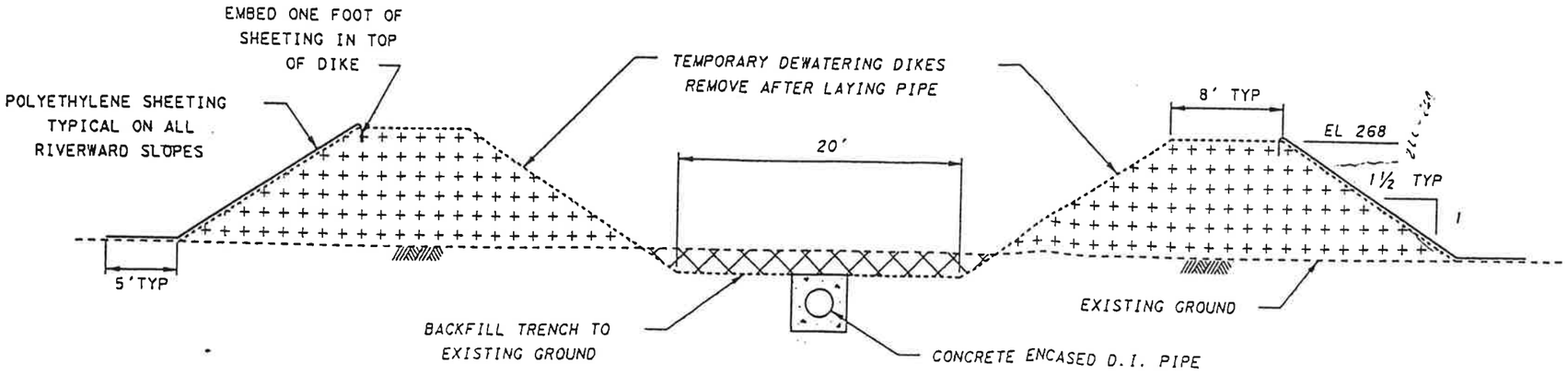
PLAN

SCALE: 1"=40'



PROFILE

HORIZ SCALE: 1"=40' VERT SCALE: 1"=20'



TYPICAL DIKE SECTION

SCALE: 1"=10'

CADD FILE - ODIE/USR7/COLUMBIA/JOHNDAY/DRAWDWN/DW/OUTFALL.DGN

COLUMBIA RIVER - OREGON/WASHINGTON
JOHN DAY POOL DRAWDOWN STUDY
CITY OF UMATILLA
SEWAGE TREATMENT PLANT OUTFALL

PLAN, PROFILE AND SECTIONS

DECEMBER 1994

FIGURE 2

NORTHWEST PIPELINE CORPORATION
ONE OF THE WILLIAMS COMPANIES

MEMORANDUM

Date:	September 20, 1994	File No.:	Columbia
To:	Russ Amato	From:	Mike Van Hook
Company:	NWP	Company:	NWP
Department:	PASCO	Department:	P/L Engineering
Mail Stop:	PAS	Mail Stop:	10385
		Phone:	584-6798

SUBJECT: Columbia River Drawdown Conclusions

The Northwest Power Planning Council is considering a plan to operate John Day Dam at the minimum operating pool (elevation 257') in order to increase the water velocity for the benefit of migrating juvenile salmon. The John Day Pool is currently operating at 264'. There has been some concern that these changes may impact the buried pipelines by the fact that shore cover on the lines might sluff off due to the lower pool, or the cover in the river may be carried away due to the increased water velocity.

On August 11, Tom Cross, Jill Borgmeier, and I, met with Mike Brown, Geotechnical Specialist for Golder Associates, and Jerry Gardenhire, Technical Manager for Utilities Impacts for the Army Corps of Engineers. We looked at both banks of the Columbia River at the crossing of the dual 20" lines. The Corps of Engineers is recommending the use of a drawdown rate of 1 foot per day. Mike Brown felt that this rate should not pose any problems to the pipeline (See attached report from Golder Associates). If a faster drawdown rate is used there may be a problem with exposed pipe.

We are recommending that if a drawdown rate of 1 foot per day is used then nothing needs to be done to protect the pipeline. We feel that this matter has been sufficiently studied and recommend that no action be taken at this time. Any changes to the drawdown rate will be considered when they arise. If you have any questions, please contact Tom Cross or myself.

cc: L. Cherrington
S. Boudewyns
G. Hamilton
J. Esplin
S. Hayden
J. Gardenhire, COE
File

APPENDIX D

BIOSOLIDS APPLICATION SITES

CROP MANAGEMENT

The City of Umatilla utilizes three different sites for biosolids application. Each site has a different crop growing. Two of the sites are owned by the City of Umatilla, one is privately owned.

1. **4 Acres of Hybrid Poplar Trees Owned by the City of Umatilla.**

   Biosolids are applied to the trees via a 4-inch gravity feed spreader bar. As the truck is driven down the tree rows, biosolids are evenly spread out both sides through PVC piping.

   Water is applied to the trees by drip irrigation at the rate of approximately 30 gpm. Trees are watered two days per week for 24 hours. Irrigation is generally necessary June through September. Harvest is planned in 10 to 15 years.

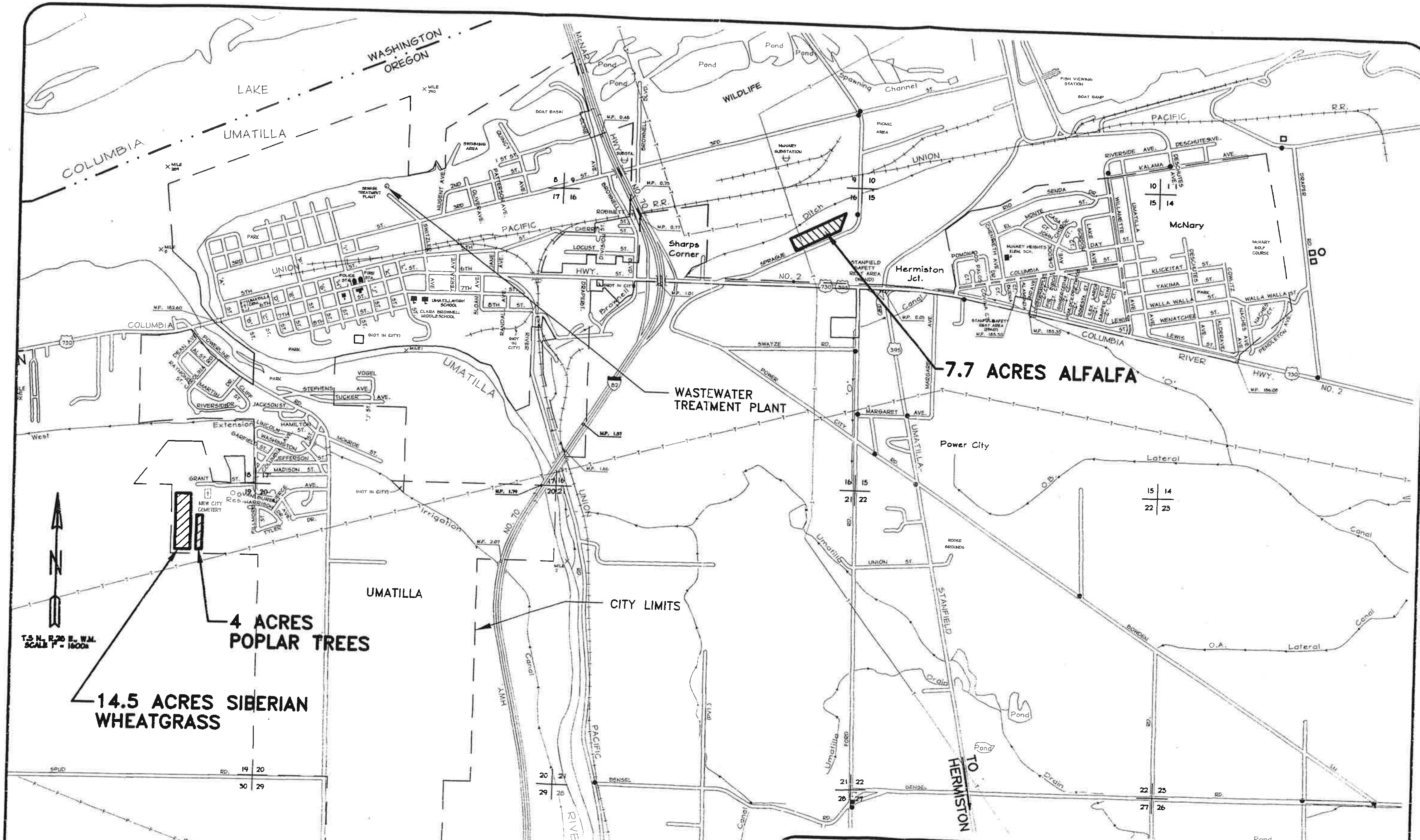
2. **14.5 Acres of Dryland Siberian Wheatgrass Owned by the City of Umatilla.**

   Biosolids are applied to the Siberian Wheatgrass via a truck-mounted high pressure trash pump and big gun combination. The biosolids are evenly applied to the crop as the truck is driven along the crop edges. The big gun sprays a distance of about 150 feet. This eliminated the need to drive on actively growing crops while applying biosolids. The grass is burned once each fall by the Umatilla Fire Department.

3. **7.7 Acres of Alfalfa Owned by Tom Hampton.**

   Biosolids are applied to the alfalfa via the big gun mentioned in the previous paragraph. The alfalfa receives about 43 inches of overhead irrigation annually. It is cut and baled four times per year. Biosolids are applied in early spring, in between cuttings, and in the fall. No harvest of the alfalfa will be done within 30 days of a biosolids application.

This information has been provided by the City of Umatilla.



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CITY OF
UMATILLA, OREGON
WASTEWATER SYSTEM STUDY
BIOSOLIDS APPLICATION SITES

APPENDIX
D

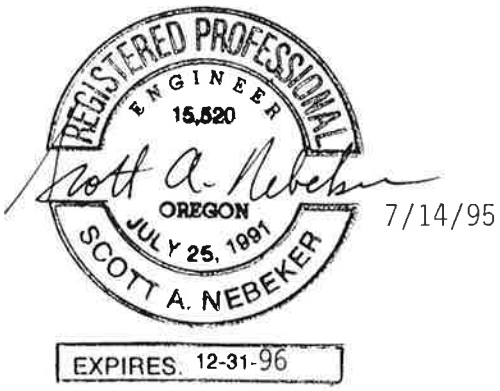
APPENDIX E

FEASIBILITY STUDY FOR SLUDGE DRYING BEDS - 1995 "EXCERPTS"

CITY OF UMATILLA, OREGON

FEASIBILITY STUDY FOR SLUDGE DRYING BEDS

1995



Anderson · Perry & Associates, Inc.

Consulting Engineers

La Grande, Oregon
Walla Walla, Washington
Baker City, Oregon
Lewiston, Idaho

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located south of the City Cemetery and consists of 4-acres of poplar trees. The third site is the Woodard site which is located just north of Highway 730 near the intersection of Interstate 82 and consists of approximately 7.7 acres which is currently being planted with rye grass.

With the ability to produce a dried sludge the City expects to have more application sites in which they can reuse the sludge since dried sludge has a higher demand within the community than does liquid sludge. These sites will require approval by DEQ and the submission of a revised sludge management plan that includes the new sites.

Treatment Plant Historical Data

In this section, treatment plant historical data will be evaluated against the minimum requirements set forth in EPA's Part 503 Sludge Regulations. A summary of the Part 503 Sludge Regulations are provided in Appendix A. This summary was compiled by CH_2M/Hill in 1993. These regulations require that the sludge be treated to meet certain minimum criteria for vector attraction reduction, and pathogen removal before the sludge can be land applied. In addition, there are limitations on ten heavy metals (arsenic, cadmium, chromium, copper, lead, mercury , molybdenum, nickel, selenium, and zinc).

When dealing with the Part 503 Sludge Regulations, the sludge is separated into two classifications, Class A and Class B. Class A sludges have more stringent requirements which allow them to be applied on lawns and home gardens. Class B sludges are restricted to bulk application to agricultural land, forest, public contact sites, or reclamation sites. The sludge produced at the Umatilla Wastewater Treatment Plant is classified as a Class B sludge.

The City of Umatilla's sludge can meet Class B vector attraction reduction requirements by satisfying one of the first 10 criteria listed in Appendix B. Criteria 1 requires that volatile solids be reduced a minimum of 38 percent. Since volatile solids reduction data from the digesters is readily available, the percent reductions obtained at the plant can be easily compared to the minimum requirements outlined in the Part 503 Sludge Regulations.

Table 3-2 is a summary of the total and volatile solids data collected at the treatment plant from November 12, 1993 to December 30, 1994. This data includes the total solids, volatile solids, percent volatile solids and percent volatile solids reduction from the influent (WAS) and effluent of each digester. As seen in Table 3-2, the average percent volatile solids reduction is 30 percent for Digester No. 1 and 33 percent for Digester No. 2. The percent volatile solids reduction was calculated using the Van Kleeck equation. The Van Kleeck equation can be written as follows:

$$FVSR = \frac{VS_{in} - VS_{out}}{VS_{in} - (VS_{in} - VS_{out})}$$

FVSR = Fractional Volatile Solids Reduction

VS = Volatile solids expressed as fractional volatile solids

Subscripts "in" and "out" refer to the sludge at the influent and effluent of the aerobic digesters.

Digester No. 1 failed to meet the 38 percent reduction 39 times out of 55 tests or 71 percent of the time, and Digester No. 2 failed 36 times out of 55 tests or 65 percent of the time. Based on the 38 percent volatile solids reduction criteria, the aerobic digesters do not consistently comply with EPA's Part 503 Sludge Regulations.

The City has performed bench-scale volatile solids reduction tests where the requirements of the Part 503 Sludge Regulations were satisfied. As stated in Criteria 3 of Appendix B, an aerobically digested sludge that does not meet the 38 percent volatile solids reduction criteria can be tested in a bench-scale lab unit for 30 additional days at a temperature of 20°C. If, at the end of this period the volatile solids are reduced by less than 15 percent, vector attraction reduction has been demonstrated.

Pathogen removal requirements can be met by reducing the fecal coliform concentration to below 2,000,000 colony forming units per gram of total solids. As seen in Table 3-3, recent fecal coliform data indicates that the aerobic digesters are capable of meeting the pathogen reduction requirements. However, the regulations require that seven samples be collected to demonstrate compliance. The geometric mean of all seven samples shall be less than 2,000,000 colony forming units per gram of total solids.

Tables 1 through 4 located in Subpart B of the Part 503 Sludge Regulations, outline the pollutant limits of the 10 heavy metals. If the pollutant concentrations of any of the 10 heavy metals are higher than those listed in Table 1, further treatment of the sludge is necessary. If the concentrations are higher than those listed in Table 3, but lower than those listed in Table 1, the sludge is subject to Cumulative Pollutant Loading Rates. These loading rates are given in Table 2. As shown in Table 3-4 of this Study, the pollutant concentrations in the City of Umatilla's sludge are less than the limits outlined in Table 3, Subpart B of the Part 503 Sludge Regulations. Therefore, cumulative pollutant loading rates do not apply.

The Gilroy Onion Dehydration Plant has a significant impact on the quality and quantity of sludge produced at the treatment plant. Therefore, historical BOD and TSS data from the dehydration plant was examined. As seen in Table 3-5, a relatively high concentration of BOD and TSS is present in the wastewater sampled from the Dehydration Plant. Using the average BOD concentration of 433 mg/L and a typical flow of 0.085 MGD, a BOD loading of 307 pounds per day can be expected from the plant. Analyzing the City's wastewater treatment plant influent data from January 1993 to August 1994, indicates that the average total BOD loading (from Dehydration Plant and residential

users) was 852 pounds per day. This illustrates that the dehydration plant contributes approximately 36 percent of the total BOD loading to the plant.

The amount of sludge processed in the digesters has steadily increased over the past five years and consequently the detention time has decreased. Due to the inability to consistently apply sludge during the winter months, the treatment plant should have the storage capacity to store sludge on site for a period of approximately three to six months. Additional facilities should be constructed which will provide sufficient storage.

Summary of Existing Deficiencies

Based on discussions with treatment plant staff, historical data, and a detailed evaluation of the treatment units against typical design criteria, the following is a summary of the existing deficiencies of the sludge treatment, handling and reuse facilities at the Umatilla Wastewater Treatment Plant:

- Digesters foam up and bubble over when mixing pumps are turned on. The aerobic digesters typically have a dissolved oxygen concentration of approximately 0.4 to 0.6 mg/L compared to a recommended concentration of 1 - 2 mg/L. Inadequate mixing and aeration is suspected to be the primary reason why the dissolved oxygen concentrations are not higher. In addition, the existing jet aeration "pod" in each digester appears to be insufficient to provide adequate mixing of the entire tank contents (based on a visual evaluation only).

- The plant has no capability for producing a dewatered sludge. There is a higher demand in the Umatilla area for dried sludge than for liquid sludge and the ability to produce a dried sludge is expected to increase the amount of application sites which will be available to the City.

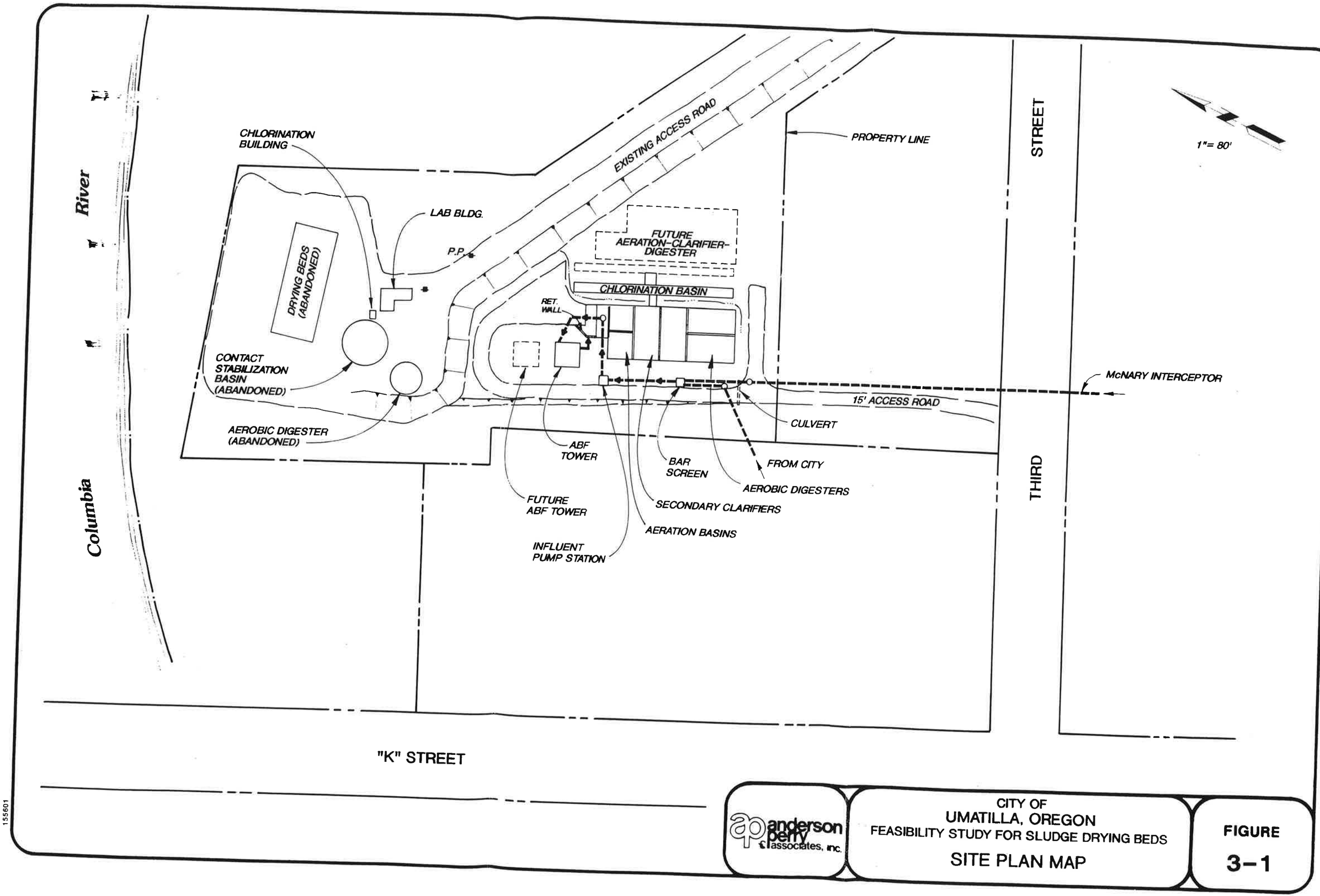
- The plant has an inadequate pumping system for transferring sludge from the aerobic digester to the sludge hauling truck or to the proposed sludge drying beds. A small building or vault should be constructed around the pumping facilities to prevent freezing and to provide a location for permanent electrical wiring.

- The existing aerobic digesters have had limited success in meeting vector attraction reduction requirements outlined in EPA's Part 503 sludge regulations. The inability to comply with these regulations may require the City to alter current operation practices or construct additional treatment facilities.

- If possible with the existing equipment and manpower available, the method of sludge wasting to the digesters should be improved. It would be more desirable to provide operational controls and equipment so that the wasting of sludge took place for shorter periods of time spaced throughout the day. This would decrease slug loadings of sludge to the digesters. Currently, the

wasting occurs one time per day at a flow rate of approximately 150 gpm for about 30 minutes.

- Due to the lack of sludge storage capacity present at the treatment plant, additional storage capacity is required to handle periods when sludge cannot be land applied.



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CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS

SITE PLAN MAP

FIGURE
3-1

SUMMARY OF DESIGN CRITERIA

AERATION BASIN

Number of Basins	2
Dimensions, single basin (feet)	25 x 14
Volume, each (gallons)	26,350

SECONDARY CLARIFIER

Number of Clarifiers	2
Dimension, single clarifier (feet)	24 x 50
Side Water Depth (feet)	8.2
Volume, each (gallons)	72,000
Surface Area (ft^2)	1,200

AEROBIC DIGESTER

Number of Digesters	2
Dimensions, single digester (feet)	24.5 x 52
Volume, each (gallons)	114,000
Estimated Hydraulic Detention Time Using Both Digesters @ 4,500 gpd (days)	43
Suggested Hydraulic Detention Time (days)[1]	12 - 18
Estimated Solids Loading Using Both Digesters (lbs VS/ft^3/day)	.01
Suggested Solids Loading Using Both Digesters (lbs VS ft^3/day)[1]	0.1-0.2
Typical Dissolved Oxygen Residual (mg/L)	.4 - .6
Suggested Dissolved Oxygen Residual (mg/L)[1]	1 - 2
Typical Volatile Solids Reduction (percent)	30 - 35
Suggested Volatile Solids Reduction (percent)[1]	38 - 50

Notes:

(1) Criteria for Sewage Works Design, State of Washington, Department of Ecology, DOE 78-5.

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CITY OF
UMATILLA, OREGON
SEWER FEASIBILITY STUDY FOR SLUDGE DRYING BEDS

SUMMARY OF DESIGN CRITERIA

TABLE
3-1

Date	Influent RAS			Effluent Digester No. 1				Effluent Digester No. 2			
	Total Solids (mg/l)	Volatile Solids (mg/l)	Percent Volatile Solids (%)	Total Solids (mg/l)	Volatile Solids (mg/l)	Percent Volatile Solids (%)	Percent VS Reduction (%)	Total Solids (mg/l)	Volatile Solids (mg/l)	Percent Volatile Solids (%)	Percent VS Reduction (%)
11/12/93	18556	13676	73.7	18840	11912	63.2	38.6	18308	11508	62.9	39.6
11/19/93	17660	12604	71.4	17568	11384	64.8	26.2	16780	10376	61.8	35.0
11/26/93	17224	12472	72.4	19492	12772	65.5	27.6	19312	12248	63.4	33.9
12/3/93	16680	12132	72.7	13468	8940	66.4	26.0	15308	9444	61.7	39.6
12/10/93	16440	12420	75.5	18536	12296	66.3	36.2	19640	12228	62.3	46.6
12/17/93	17552	12732	72.5	17540	12056	68.7	16.8	19648	12148	61.8	38.7
1/1/94	15392	10888	70.7	15760	10324	65.5	21.4	18060	11500	63.7	27.5
1/7/94	15676	11604	74.0	16284	10940	67.2	28.2	19456	12452	64.0	37.6
1/14/94	14552	11000	75.6	18140	11944	65.8	37.8	15892	10356	65.2	39.6
1/21/94	15004	11268	75.1	14596	9360	64.1	40.7	16012	10904	68.1	29.2
1/28/94	14820	11244	75.9	16748	11288	67.4	34.2	16800	11324	67.4	34.2
2/4/94	14092	10720	76.1	15112	9904	65.5	40.2	16432	11496	70.0	26.7
2/11/94	14488	11112	76.7	16232	10688	65.8	41.4	17484	12084	69.1	32.0
2/18/94	13792	10952	79.4	16232	11528	71.0	36.5	16168	11376	70.4	38.4
2/25/94	14424	11236	77.9	14512	9260	63.8	50.0	15884	11360	71.5	28.8
3/4/94	14164	10956	77.4	16768	7884	47.0	74.0	15588	10952	70.3	30.8
3/11/94	13696	10324	75.4	14652	9748	66.5	35.1	14984	10508	70.1	23.3
3/18/94	12704	9752	76.8	13916	9872	70.9	26.1	13780	9880	71.7	23.3
3/25/94	12488	9420	75.4	15520	10632	68.5	29.2	13896	9520	68.5	29.1
4/1/94	11100	9492	85.5	13320	9386	70.5	59.6	12808	8916	69.6	61.2
4/8/94	11652	8900	76.4	14964	10672	71.3	23.1	12180	8696	71.4	22.8
4/15/94	10576	8264	78.1	13212	9800	74.2	19.6	12648	9112	72.0	27.9
4/22/94	11476	8460	73.7	13544	9392	69.3	19.4	12672	8372	66.1	30.6
4/29/94	9456	7318	77.4	13268	9352	70.5	30.2	12588	8584	68.2	37.4
5/6/94	13368	11244	84.1	14098	10266	72.8	49.4	14380	9996	69.5	56.9
5/13/94	12428	9444	76.0	13604	9356	68.8	30.4	13300	8884	66.8	36.4
5/21/94	11668	8732	74.8	13208	8964	67.9	29.0	12392	8092	65.3	36.7
5/28/94	11628	8816	75.8	13656	9392	68.8	29.7	12416	8248	66.4	36.9
6/3/94	12416	9184	74.0	14068	9640	68.5	23.4	12204	7804	63.9	37.6

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CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS

HISTORICAL TOTAL AND VOLATILE SOLIDS DATA

TABLE
3-2

Date	Influent RAS			Effluent Digester No. 1				Effluent Digester No. 2			
	Total Solids (mg/l)	Volatile Solids (mg/l)	Percent Volatile Solids (%)	Total Solids (mg/l)	Volatile Solids (mg/l)	Percent Volatile Solids (%)	Percent VS Reduction (%)	Total Solids (mg/l)	Volatile Solids (mg/l)	Percent Volatile Solids (%)	Percent VS Reduction (%)
6/10/94	9760	7096	72.7	13296	9520	71.6	5.3	12072	8096	67.1	23.6
6/17/94	11840	8368	70.7	12748	8384	65.8	20.3	11452	7040	61.5	33.8
6/24/94	12936	9384	72.5	12652	8908	70.4	9.9	11396	7304	64.1	32.4
7/1/94	14540	10260	70.6	15572	10200	65.5	20.8	15304	9744	63.7	26.9
7/15/94	10332	6764	65.5	16636	10604	63.7	7.3	17084	10576	61.9	14.3
7/22/94	13344	9276	69.5	15872	10310	65.0	18.7	17220	11344	65.9	15.3
7/29/94	10512	7140	67.9	15768	9716	61.6	24.2	18544	11276	60.8	26.7
8/5/94	11128	7832	70.4	17572	11464	65.2	21.0	18500	11348	61.3	33.2
8/12/94	11944	8548	71.6	16916	10740	63.5	30.9	18684	12080	64.7	27.3
8/26/94	16180	11132	68.8	19784	12140	61.4	28.0	19116	11596	60.7	30.1
9/2/94	12384	8680	70.1	18904	12196	64.5	22.4	19768	12160	61.5	31.8
9/10/94	12240	8600	70.3	21160	13080	61.8	31.5	19596	12072	61.6	32.1
9/17/94	14988	10840	72.3	23048	14376	62.4	36.6	22936	14920	65.1	28.8
9/24/94	11980	9936	82.9	23700	14924	63.0	65.0	22868	14204	62.1	66.3
9/30/94	11996	9128	76.1	20360	13584	66.7	37.0	20804	12604	60.6	51.7
10/7/94	14440	10824	75.0	23208	15040	64.8	38.5	21884	13396	61.2	47.3
10/14/94	14328	11348	79.2	20544	13156	64.0	53.2	20564	13956	67.9	44.5
10/21/94	15548	11956	76.9	17412	11480	65.9	41.9	20292	12776	63.0	48.9
10/28/94	11788	8712	73.9	19976	13000	65.1	34.2	19728	13404	67.9	25.2
11/5/94	13804	10068	72.9	20780	13352	64.3	33.3	18528	12128	65.5	29.7
11/11/94	14516	10640	73.3	22316	15616	70.0	15.1	18252	12008	65.8	29.9
12/2/94	14156	10984	77.6	18716	12364	66.1	43.8	15992	10488	65.6	45.0
12/9/94	14304	11256	78.7	20040	13620	68.0	42.6	14072	9404	66.8	45.4
12/16/94	13032	10276	78.9	18688	13020	69.7	38.4	13752	9104	66.2	47.5
12/23/94	12612	9892	78.4	17124	12060	70.4	34.5	14040	9740	69.4	37.7
12/30/94	14256	11224	78.7	18784	12808	68.2	42.1	14392	10244	71.2	33.3
Average	12829	9276	70	16007	10244	62	30	15584	9856	61	33

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CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS
HISTORICAL TOTAL AND VOLATILE SOLIDS DATA

TABLE
3-2
(Cont'd)

Date	Fecal Coliform (Bacteria/Gram of Total Solids)
11/15/94	83,000
11/22/94	17,400
4/4/95	1,800,000

Note:
As stated in EPA's Sludge Regulations Part 503, the geometric mean of the fecal coliform densities shall be less than 2,000,000 colony forming units per gram of total solids.

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CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS

FECAL COLIFORM DATA

TABLE
3-3

Analysis	Method	As Received[xx]	Dry Weight	Limits of Table 3[xxx]	Units
Arsenic	*	<0.04	<3	41	mg/kg
Cadmium	*	0.04	3.1	39	mg/kg
Chromium	*	0.38	32	1,200	mg/kg
Copper	*	1.2	99	1,500	mg/kg
Lead	*, EPA 7420	0.35	29	300	mg/kg
Mercury	EPA 7471	0.004	0.3	17	mg/kg
Molybdenum	*	0.16	13	18	mg/kg
Nickel	*	0.12	9.7	420	mg/kg
Potassium	*	160	13,000	---	mg/kg
Selenium	*	0.07	6	36	mg/kg
Zinc	*	6.4	530	2,800	mg/kg
pH	EPA 9045	7.29	---	---	S.U.
Ammonium Nitrogen	SM 417A&D	0.026	2.2	---	%
Nitrate Nitrogen	SM 418E	0.0050	0.42	---	%
Total Kjeldahl Nitrogen	SM 420	0.086	7.2	---	%
Total Phosphorus	*	0.029	2.4	---	%
Total Solids	SM 209F	1.2	---	---	%
Volatile Solids **	SM 209F	0.80	---	---	%

xx Sample taken on April 4, 1994

* Sample preparation by EPA SW-846 Method 3050. Analysis by EPA SW-846 Method 6010, ICP, unless otherwise indicated.

** Reported as % of total sample.

xxx As outlined in Subpart B (Land Application Requirements) of EPA's Part 503 Municipal Sewage Sludge Regulations

SM Means Standard Methods for the Examination of Water and Wastewater, 1985, 16th Edition.

The less than "<" symbol means none detected at or above the indicated value and represents the detection limit for the method.

Date	pH	Total Suspended Solids (mg/l)	Biochemical Oxygen Demand (mg/l)
1/4/93	6.79	82	180
1/15/93	6.94	120	290
1/21/93	5.71	170	440
2/9/93	6.57	95	140
2/2/93	6.6	98	800
1/27/93	6.12	106	230
2/27/93	7.1	73	200
2/24/93	6.51	127	240
3/9/93	6.42	60	120
3/17/93	6.99	88	160
3/26/93	5.07	110	360
3/31/93	5.18	86	260
4/13/93	6.25	79	230
4/28/93	5.84	75	310
5/7/93	4.8	97	470
5/12/93	4.69	110	580
8/25/93	6.48	98	240
9/2/93	6.76	140	360
9/8/93	6.63	170	290
9/14/93	6.33	220	230
9/22/93	6.95	190	230
9/28/93	6.61	280	280
10/6/93	6.34	230	350
10/13/93	5.46	194	430
10/21/93	6.36	120	280
10/29/93	6.53	110	250
11/4/93	5.8	290	300
11/10/93	8.69	59	280
10/16/93	6.86	130	250
11/22/93	5.89	120	350
12/7/93	7.01	100	300
12/14/93	6.69	140	510
12/21/93	6.95	180	870
12/28/93	6.41	140	950
1/5/94	6.34	100	200
1/19/94	5.55	200	350
1/26/94	5.04	450	190
2/1/94	6.62	130	210
2/8/94	6.85	120	300
2/16/94	5.08	200	630
2/23/94	6.18	160	270
8/24/94	5.01	540	740
8/29/94	5.43	240	420
9/14/94	5.69	210	650
9/20/94	5.46	410	550
10/5/94	4.4	270	970
10/12/94	4.28	320	1400
10/20/94	5.32	400	970
10/26/94	5.89	890	630
11/2/94	6.2	240	480
11/8/94	5.68	210	880
11/15/94	6.44	490	800
11/29/94	5.13	230	570
Average	6.09	194	433

Note:
Flows from the Onion Dehydration Plant range from 75,000 to 100,000 gallons per day.

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CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS
BOD AND TSS DATA FROM
GILROY ONION DEHYDRATION PLANT

TABLE
3-5

CHAPTER 4

DESIGN CONSIDERATIONS

General

This chapter of the Feasibility Study for Sludge Drying Beds will estimate the quantity of sludge produced for the 5, 10, 15 and 20-year planning periods. As previously stated, the sludge drying beds will be designed based on the 10-year planning period. The preliminary design of the beds will be performed to illustrate the conceptual layout, size, and number of beds required. Based on the preliminary design, a cost estimate will be prepared. A environmental impact assessment will be preformed to analyze any adverse affects that may be caused by the construction of the sludge drying beds. Finally, a summary of contacts made with the U.S. Army Corps of Engineers to initiate a land purchase request for land on which to construct the new drying beds will be given.

Sizing of Sludge Drying Beds

As stated in Chapter 2, the uncertainties involved with the City's growth make it difficult to predict the 20-year sludge production. In order to prevent overbuilding, the sludge drying beds will be designed to handle the 10-year projected sludge production. However, the design and layout of the beds will allow for additional beds that may be required at a later date to handle the 20-year projected sludge production.

Preliminary sizing of sludge drying beds can be done using two different methods. The first method is based on the expected solids loading to the sludge drying beds. Based on Criteria for Sewage Works Design published by the Washington State Department of Ecology, the required area for a sludge derived from a suspended growth treatment process can be computed using the criteria of 12 pounds per square foot per year. In order to utilize this design criteria, the expected quantity of sludge produced in a year by the treatment plant must be established.

As illustrated in Figure 4-1, the volume of liquid sludge hauled from the Umatilla Wastewater Treatment Plant has steadily increased since 1989. A portion of this increase can be attributed to the Gilroy Onion Dehydration Plant (formerly Dehydration Specialists, Inc. and Haas Foods) which came on-line in November of 1989. According to City staff, the dehydration plant had intermittent and inconsistent operation during 1990 but eventually levelled off in 1991 and 1992. Therefore, the portion of sludge contributed by the dehydration plant can be estimated by subtracting the volume of sludge contributed by residential users from the average volume of sludge hauled from the plant in 1991 and 1992. The volume of sludge contributed by residential users was estimated to be 252,000 gallons per year which was the average volume hauled from the treatment plant in 1988 and 1989. Subtracting 252,000 gallons per year from the average hauled in 1991 and 1992 yields 314,200 gallons per year.

During the period between 1992 and 1994 the volume of sludge hauled from the treatment plant significantly increased. This increase was most likely due to a combination of increased population and increasing operations at the dehydration plant. For the purposes of making projections, this increase was split equally between the residential and commercial/industrial users. The volume of sludge generated at the plant for each five-year period until the year 2015 is shown in Figure 4-2. Similar to population projections discussed in Chapter 2, the residential portion was increased 2 percent per year. The industrial/commercial portion was increased 25 percent per five year period. Using these growth rates the total volume of sludge hauled from the plant increased to 1,204,800 gallons in the year 2005.

The estimated volume of liquid sludge can be converted to a quantity of solids by assuming the sludge weighs 8.34 pounds per gallon and the total solids content of the sludge is 2.0 percent. Even though Table 3-2 indicated an average total solids content of 1.6 percent, 2.0 percent is used to obtain a more conservative estimate. Therefore, the 10-year solids quantity is 201,000 pounds per year. Applying the design criteria of 12 pounds per square foot per year indicates that 16,746 square feet of drying beds are required. Table 4-1 summarizes the required area for each five-year increment.

The second method of sizing sludge drying beds is based on population. Based on Criteria for Sewage Works Design published by the Washington State Department of Ecology, the required area for a sludge derived from suspended growth treatment processes ranges from 3.0 to 4.5 square feet per capita.

Using the procedures outlined in Chapter 2, the projected 10-year population is 3,840. Multiplying the 10-year population of 3,840 by 4.5 square feet per capita yields 17,280 square feet. This is in the same range as the 16,746 square feet which was calculated using the solids criteria. A summary of the required sludge drying bed area using the population criteria is also presented in Table 4-1. Though this method does not consider industrial and commercial users, it contains safety factors because it uses a conservative growth rate of 2.0 percent per year and it uses the highest square feet per capita recommended in the design criteria.

Based on the most conservative design criteria of 17,280 square feet, it is recommended that 12 sludge drying beds be constructed with the dimensions of 60 feet by 25 feet. This yields a total area of 18,000 square feet. The construction of four additional beds at a later date will increase the total area to 24,000 square feet which is sufficient to meet the projected 20-year required area of 23,800. As previously stated, the design and layout of the initial 12 sludge drying beds will be done in such a manner that four additional sludge drying beds can be easily incorporated into the existing system.

Development of Improvement Package

A cost estimate for the design and construction of 12 sludge drying beds is presented in Table 4-2. The estimated costs include costs for legal, engineering, land acquisition, administration and contingency. As illustrated in Figure 4-3, each of the 12 proposed drying beds will have concrete walls with an asphalt bottom which slopes to the

center. Influent sludge will be pumped from the aerobic digesters to a block of four drying beds using the valving located on the north side of the sludge drying beds. The sludge can be directed into each individual bed using the rotating distribution piping in the center of the four beds.

New pumping and valving will be constructed at the aerobic digesters so the liquid sludge can be pumped from either digester to the sludge drying beds or to the sludge hauling truck. Valving can either be buried beneath the ground or housed in a valve vault. The pump and controls will be placed on a concrete pad inside a simple steel shed. Permanent power will be wired into this building.

A perforated pipe located in the center channel of each drying bed will collect the leachate and transport it to the drain piping which is located along the north side of the drying beds. From here the leachate flows by gravity to a wet well located at the northwest corner of the beds. A sump pump will then pump the leachate to the head of the wastewater treatment plant. Depending on the final elevation of the sludge drying beds, it is possible that the leachate could flow by gravity to the head of the plant or to the wet well of the influent pump station. However, for the purpose of this study, it was assumed that a pump will be required.

Each of the beds will have an access ramp down into the beds which will enable a loader tractor to easily scoop the dried sludge into a dump truck or manure spreader. The cost estimate does not include the price of a loader tractor or manure spreader.

Compliance with 503 Sludge Regulations

It is possible that operational improvements could be made to the existing aerobic digesters which would allow them to meet EPA's Part 503 Sludge Regulations. Alterations could be made to the existing aeration system to improve mixing and the available oxygen, a method of decreasing foaming could be investigated so that the mixing pumps of the jet aeration system could be utilized, and the WAS pumping frequency could be altered as recommended. However, the construction of sludge drying beds would provide additional assurance that the 503 Sludge Regulations could be met on a consistent basis. The sludge drying beds would also provide storage during the winter months and a sludge that is in a form which is more acceptable to local farmers.

As the digesters are currently operated, it appears that fecal coliform concentrations are reduced below the required 2,000,000 colony forming units per gram of total solids. Since the aerobic digesters will continue to operate with the addition of sludge drying beds, the pathogen reduction requirements of the 503 regulations will be satisfied. In addition, it appears that the concentrations of the 10 heavy metals fall below the requirements of Table 3, Subpart B of the Part 503 Sludge Regulations.

The other requirement that must be satisfied in the 503 sludge regulations is the vector attraction reduction requirements. This is the portion of the 503 regulation which the aerobic digesters have had difficulty satisfying in the past. The sludge drying beds can meet the vector attraction reduction requirements by satisfying the criteria which

states that the percent solids of sludge, that does not contain unstabilized primary treatment solids, shall be a minimum of 75 percent based on the moisture content and total solids prior to mixing with other materials. This criteria can be easily achieved in sludge drying beds when operated correctly under the proper conditions.

The addition of sludge drying beds will also provide the plant with badly needed sludge storage space. Using an application depth of approximately 1.5 feet, the 12 proposed beds can provide 200,000 gallons of additional storage space. At the existing sludge production rate of 71,000 gallons per month, the beds will provide approximately 3 months of storage capacity if no sludge was land applied during this time. This assumes the worst case scenario where no evaporation or dewatering takes place and sludge cannot be removed from the beds.

Environmental Impact Assessment

Since the proposed drying beds have an asphalt lined bottom with a leachate collection system which is routed back to the head of the wastewater treatment plant, the system is designed to prevent seepage into the ground. The water contained in the sludge enters the perforated pipe located in the channel beneath the beds. Once the leachate reaches the edge of the beds, a non-perforated pipe transports it to the wastewater treatment plant headworks. The water that does not readily drain off is evaporated. Evaporation is enhanced by spreading the sludge in a relatively thin layer over a large area. Sludge should be added to the beds one time to the full 1.5-foot depth. Adding the sludge to a single bed intermittently hampers drainage and evaporation.

Once the sludge is dry and meets the requirements of EPA's Part 503 Sludge Regulations, it is considered environmentally safe and can be reused for the purposes allowed in the Regulations. By following the procedures of a DEQ approved sludge management plan, the sludge can be applied on nearby cropland. Farmers will use the sludge to supplement their fertilizing needs.

The liquid sludge that is first applied to the drying beds has already received a significant amount of treatment from the aerobic digesters. Since historical data indicates that the percent volatile solids portion of the sludge is typically reduced to approximately 60 percent in the aerobic digesters, odors should not be significant in the area surrounding the drying beds. Since the area immediately surrounding the proposed drying beds is not used for residential purposes, odor complaints are not expected to be a significant problem.

Corps of Engineer's Land Purchase Request

Construction of the John Day Dam, located approximately 70 miles downstream of Umatilla on the Columbia River, was completed in 1968. During construction of this dam, the United States Army Corps of Engineers obtained land on both sides of the Columbia River in the area estimated to be covered by the backwater created by the Dam. Most of the City of Umatilla's Wastewater Treatment Plant is located on land owned

by the Federal Government that is not underwater. This land is utilized by the City of Umatilla through easements and leases from the Corps of Engineers. Corps of Engineer records show that the City owns approximately 1/2-acre of the existing 4-acre treatment plant site.

In order to provide additional space for the construction of sludge drying beds, assistance was provided to the City of Umatilla during the preparation of this Feasibility Study for Sludge Drying Beds to initiate a land purchase request from the Corps of Engineers. Lease costs to the City have increased and have contributed to the City's decision to pursue land purchase. The land purchase request was for the 3-1/2 acres the City already utilizes through lease or easement and for an additional 5-1/2 acres adjacent to the treatment plant to provide room for sludge drying bed construction, for a total land purchase request of approximately 9 acres.

Initial telephone contact was made with the Corps of Engineers in November, 1994. This telephone contact helped establish lines of communication and gave the City a preliminary understanding of what steps would be required to purchase the land from the Corps of Engineers. In a letter dated November 29, 1994, the City of Umatilla made a formal request for information regarding land acquisition. At this point in the conversations with the Corps of Engineers, the City was requesting information on two options. First would be to obtain a long-term lease for the desired land, and second, acquire outright ownership of the desired land. Information requested was a general discussion of procedures involved with either option, what reviews and approvals would be required, the advantages and disadvantages of one option over another, and the Corps of Engineers best estimate of the time required to complete each process.

The Corps of Engineers responded to the City's request for information in a letter dated January 30, 1995. Briefly summarizing the Corps of Engineers' response, if the City chose to pursue the lease option, Public Law 100-581 states that the Secretary of the Interior has the "right of first refusal" (after consultation with local indian tribes) to accept any federal lands adjacent to the Columbia River that are offered for lease or sale. The letter stated that this portion of Public Law 100-581 contains no exceptions, nor does it grant discretionary authority to the Secretary of the Army to select which lands are offered to the Department of the Interior and which are not. Therefore, before the Corps of Engineers and the City of Umatilla could proceed with a long-term lease of additional Federal property beyond that the City currently leases, the affected property would first have to be offered to the Department of the Interior. If the Department of the Interior and local tribes determined that these lands were desirable, the Department of the Army would be required to transfer them to the Department of the Interior for Indian Treaty Access, and they would not be available for any other uses. As one might expect, experience with this legislation has shown that many portions of it are controversial. It is difficult to predict the outcome of this effort or the time-frame involved, but previous experience has shown that it may take up to a year or more to complete this process.

If purchasing (the Corps of Engineers uses the term "disposal" to describe someone purchasing Federal land) of the land were desired, Public Law 100-581 would still apply. In addition, Title V of the Stewart B. McKinney Homeless Assistance Act,

Public Law 100-77 requires that all properties identified as unutilized, under utilized, or excess, be reported on a quarterly basis for review by the Department of Housing and Urban Development for possible housing and assistance for the homeless. In addition, prior to any action being taken, the land would be turned over to the Federal General Services Administration (GSA) and offered to other federal agencies.

After discussing and considering each option, the City of Umatilla determined that either option entailed a significant amount of paperwork and potentially lengthy times for the review and approval process by the various federal agencies. Consequently, it was determined that the option that could potentially give the City outright ownership of the land would be the desired option. On April 4, 1995, Mayor George Hash signed Resolution No. 26-95. This resolution authorizes the City of Umatilla to initiate and complete the process with the U.S. Army Corps of Engineers for the purchase of property adjacent to the wastewater treatment plant to construct a sludge drying bed facility. In a letter to the Corps of Engineers from the City of Umatilla dated April 26, 1995, the City of Umatilla made a formal request to initiate action to complete the process for purchasing the property. Attached to this letter was a copy of Resolution No. 26-95, a brief description of the intended uses of the purchased land, and a map showing those areas the City intended to purchase. The total acreage requested for purchase is approximately 9 acres.

On May 5, 1995, a follow-up phone call was made from the Corps of Engineers to the City of Umatilla to verify that the City understood the potential steps involved with their land purchase request. Some of the items discussed included:

1. The City would likely have to pay for an Environmental Impact Statement for the land to be purchased to assure that it was clear of all toxic materials. The estimated cost for this type of environmental assessment was from $2,000 to $5,000.

2. The City would most likely be required to pay for an appraisal of the land to establish the market value.

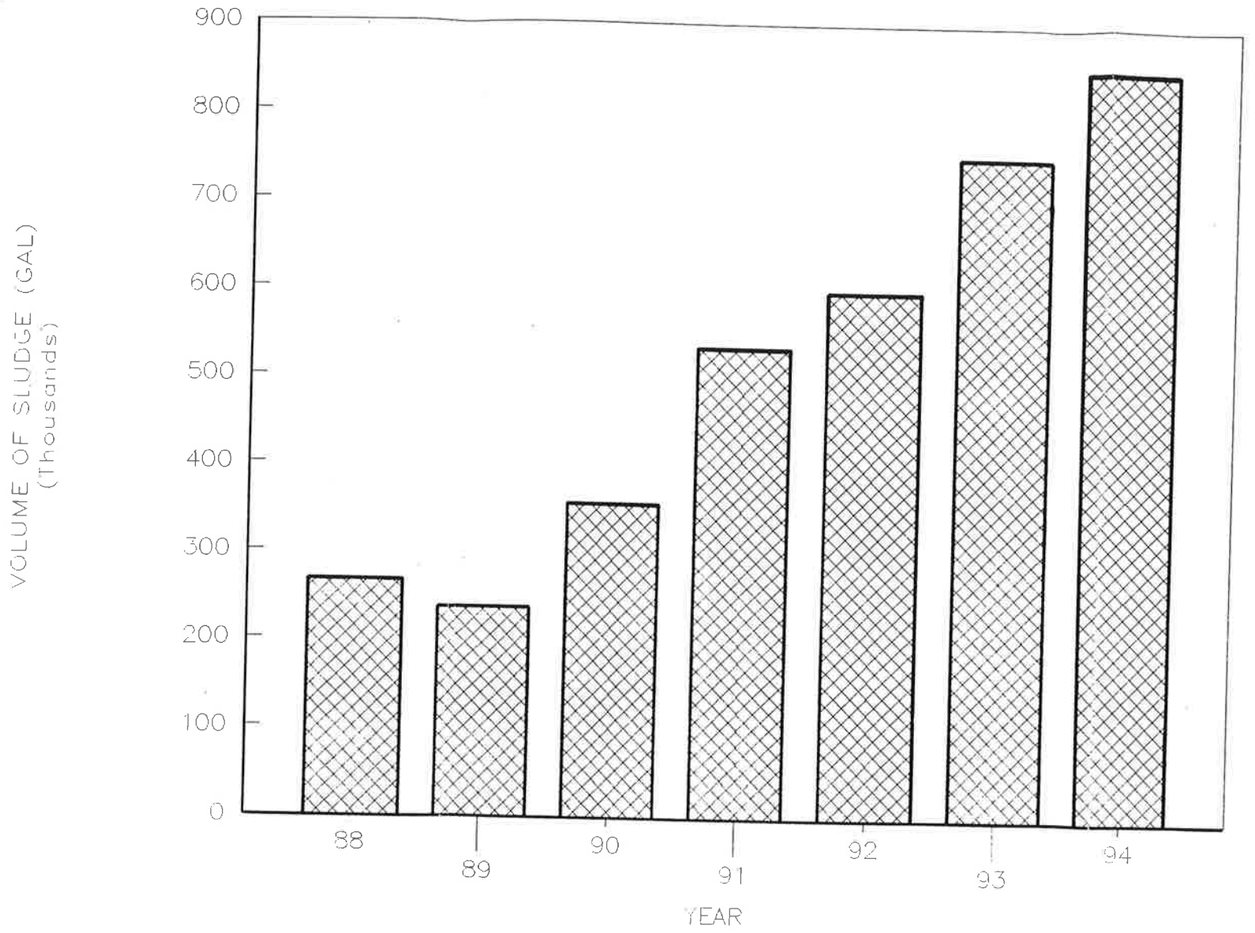
3. The City was reminded that the land purchase request would be reviewed with the Bureau of Indian Affairs and the four local indian tribes (Warm Springs, Yakama, Umatilla, and Nez Perce).

4. The City was reminded of the screening process through the Department of Housing and Urban Development to see if this agency was interested in this land for possible housing assistance for the homeless and review with other federal agencies.

5. The Corps of Engineers wanted to make sure the City understood that, with all of the reviews and agencies involved, there was no guarantee the City would be able to purchase the desired land.

After discussing these items with City officials, the City informed the Corps of Engineers to continue processing their land purchase request.

It is recommended that the City identify one person to keep in regular contact with the Corps of Engineers to provide information and encouragement through the land purchase request process. Experience has shown that this is imperative in assuring the City's request does not get bogged down and that the request is processed in a timely manner.



155601

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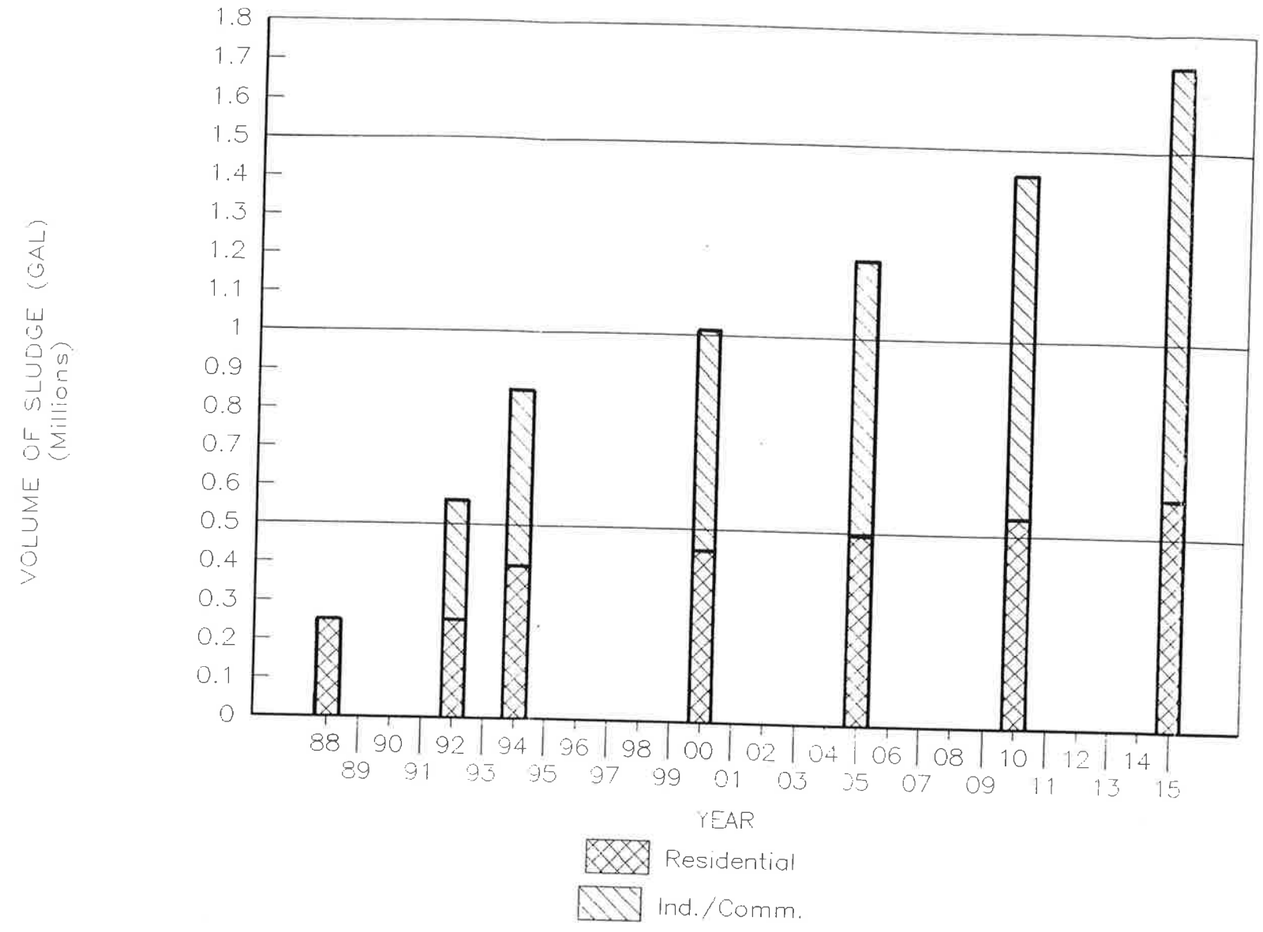
CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS

HISTORICAL SLUDGE PRODUCTION

FIGURE
4-1



155601

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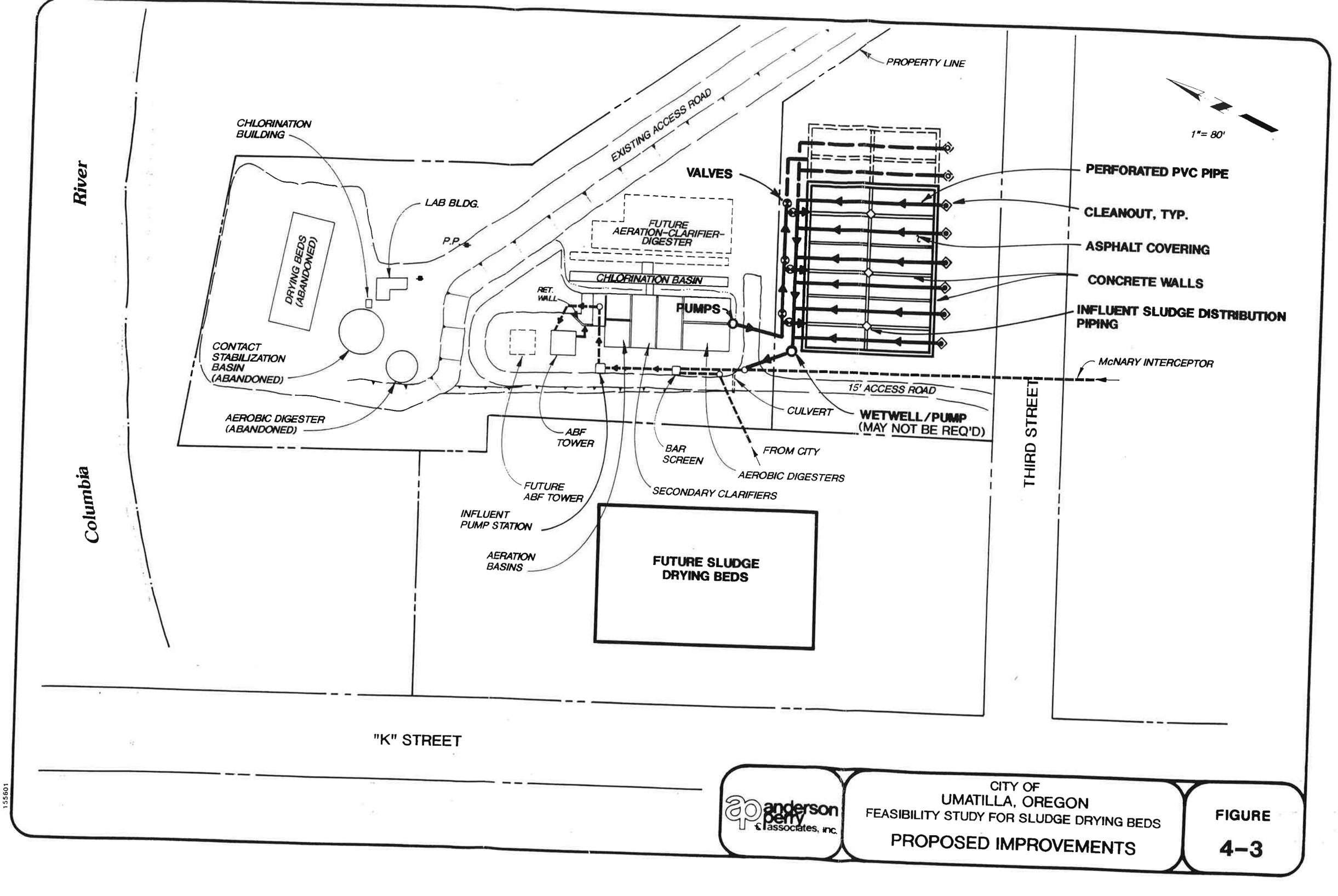
CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS
PROJECTED SLUDGE GENERATION

FIGURE
4-2



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CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS

PROPOSED IMPROVEMENTS

FIGURE
4-3

YEAR	PROJECTED VOLUME OF LIQUID SLUDGE (gal/year)	PROJECTED MASS OF SLUDGE (lbs/year)	REQUIRED AREA FOR SLUDGE DRYING BEDS[1] (square feet)	POPULATION	REQUIRED AREA FOR SLUDGE DRYING BEDS[2] (square feet)
2000	1,015,200	169,300	14,100	3,478	15,651
2005	1,204,800	201,000	16,746	3,840	17,280
2010	1,435,200	239,400	19,900	4,239	19,076
2015	1,714,800	286,000	23,800	4,681	21,065

NOTE:

1. Using 12 pounds per square feet per year as suggested by Criteria for Sewage Works Design, State of Washington, Department of Ecology, DOE 78-5.

2. Using 4.5 square feet per capita as suggested by Criteria for Sewage Works Design, State of Washington, Department of Ecology, DOE 78-5.

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CITY OF
UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS
REQUIRED AREA FOR
SLUDGE DRYING BEDS

TABLE
4-1

CITY OF UMATILLA, OREGON
CONSTRUCTION OF
12 SLUDGE DRYING BEDS
ESTIMATED PROJECT COST
(1997 PRICES)

	ITEM	QUANTITY	UNIT PRICE	TOTAL COST
1.	Mobilization/demobilization (7%)	L.S.	All Req'd	18,700
2.	Earthwork - excavation	2,500 C.Y.	6.00	15,000
3.	3/4"-0 gravel	450 C.Y.	22.00	9,900
4.	Asphalt covering	2,000 S.Y.	22.00	44,000
5.	Concrete walls/footings	200 C.Y.	440.00	88,000
6.	Fencing - 6-foot chain link	800 L.F.	17.00	13,600
7.	Sand/pea gravel	50 C.Y.	16.00	800
8.	Piping	1,800 L.F.	22.00	39,600
9.	Valves	9	400/ea.	3,600
10.	Manhole connection	L.S.	All Req'd	1,000
11.	Channel	180 C.Y.	5.00	900
12.	Pumping Improvements at Aerobic Digester	L.S.	All Req'd	20,000
13.	Pump/wet well	L.S.	All Req'd	5,000
14.	Gravel surface restoration	450 S.Y.	22.00	9,900
	TOTAL ESTIMATED COST (1996 PRICES)			**270,000**
	Construction Contingency - 10%			27,000
	Land Acquisition (including environmental impact statement and appraisal costs)			30,000
	Grant Administration			7,500
	Audit			1,500
	Legal			10,000
	Design Engineering			26,000
	Construction Engineering Including surveying, staking, construction review, quality control testing, etc.			27,000
	TOTAL ESTIMATED PROJECT COST (1996 PRICES)			**$399,000**

CITY OF UMATILLA, OREGON
FEASIBILITY STUDY FOR SLUDGE DRYING BEDS
APPENDIX B - VECTOR ATTRACTION REDUCTION REQUIREMENTS

One of the following criteria must be met to satisfy the vector attraction reduction requirements in order to land apply or surface dispose of sewage sludge. The use of vector attraction reduction criteria shall be as follows:

- For bulk sewage sludge applied to agricultural land, forests, public contact sites, or reclamation sites, any one of Criteria 1 through 10 may be used.
- For bulk sewage sludge applied to lawns or home gardens, any one of Criteria 1 through 8 may be used.
- For surface disposal of sludge, any one of Criteria 1 through 11 may be used.
- For septage that is land applied, any one of Criteria 9, 10, and 12 may be used.
- For septage that is surface disposed, any one of Criteria 9 through 12 may be used.

Criteria 1. Volatile solids must be reduced by a minimum of 38%.

Criteria 2. For an anaerobically digested sludge that cannot meet the 38% volatile solids reduction in Criteria 1, vector attraction reduction can be demonstrated by further anaerobically digesting a portion of the sludge in a bench-scale lab unit for 40 additional days at a temperature between 30°C and 37°C. If, at the end of this period, the volatile solids are reduced by less than 17%, vector attraction reduction has been demonstrated.

Criteria 3. For an aerobically digested sludge that cannot meet the 38% volatile solids reduction in Criteria 1, vector attraction can be demonstrated by further aerobically digesting a portion of the sludge that has a 2% solids concentration or less, in a bench-scale lab unit for 30 additional days at a temperature of 20°C. If, at the end of this period the volatile solids are reduced by less than 15%, vector attraction reduction has been demonstrated.

Criteria 4. The specific oxygen uptake rate (SOUR) for sludge treated in an aerobic process shall be equal to or less than 1.5 mg O_2/hr/gram of solids (dry weight basis) at a temperature of 20°C.

Criteria 5. For aerobic processes (e.g. composting), a minimum retention time of 14 days at 40°C, minimum, must be provided. During this period, the average sludge temperature must be higher than 45°C.

Criteria 6. Sufficient alkali must be added to raise the pH to 12, or higher, for a period of 2 hours, with the sludge remaining at pH 11.5, or higher, for an additional 22 hours, all without further alkali addition.

Criteria 7. The percent solids of sludge that does not contain unstabilized primary treatment solids shall be a minimum of 75% based on the moisture content and total solids prior to mixing with other materials.

Criteria 8. The percent solids of sludge that contains unstabilized primary treatment solids shall be a minimum of 90% based on the moisture content and total solids prior to mixing with other materials.

Criteria 9. Sewage sludge subsurface injected must have no significant amount of sludge on the surface within one hour after injection. For Class A sludge, injection must occur within 8 hours after discharge from the pathogen treatment process.

Criteria 10. Surface applied sludge must be incorporated within 6 hours after application to the land. For Class A sludge, application must occur within 8 hours after discharge from the pathogen treatment process.

Criteria 11. Sludge that is placed on an active sewage sludge unit (surface disposal) shall be covered with soil or other material at the end of each operating day.

Criteria 12. The pH of domestic septage shall be raised, by sufficient alkali addition, to pH 12 or higher, and without the addition of more alkali, shall remain at pH 12 or higher, for a period of 30 minutes.

APPENDIX F

SOUTHWEST UTILITY EXTENSION STUDY - 1997 "EXECUTIVE SUMMARY"

EXECUTIVE SUMMARY

Introduction

The City of Umatilla is in the midst of facing major growth acceleration associated with four large projects planned in western Umatilla County. One of these four projects, the 1,600-bed medium security Two Rivers Correctional Facility, is being constructed in east Umatilla and is scheduled to be completed in late 1999. The Two Rivers Correctional Facility will require between 300 and 600 construction workers and about 550 people will be needed to operate and maintain the facility. In addition to the correctional facility, three other large projects are planned in western Umatilla County that could cause substantial additional growth in the City. The three projects are the Wal-Mart Regional Distribution Center, Umatilla Chemical Agent Disposal Facility, and expansion of the Union Pacific Railroad's Hinkle Yard Facility. These four projects alone are expected to create an estimated 3,000 long-term jobs in the region.

Because of this expected growth and the associated development pressure in southwest Umatilla, the City of Umatilla recognized the need to complete a study to evaluate southwest Umatilla's utility needs. This study addresses those utility evaluation needs. The scope of this study does not include an evaluation of the existing treatment plant's capability to handle the expected hydraulic and organic loadings imposed by the development in the study area. The wastewater treatment facility capacity and improvements issues will be addressed in the upcoming Wastewater System Study.

This study addresses both utility (sewer and water) extension improvements and improvements needed to the existing wastewater collection and pumping and water systems. Estimated costs of the extension improvements are provided on the basis of the 0proposed conceptual extension layouts. Refer to Table ES-2 for a summary of the estimated costs of the sewer and water extension improvements. The actual layout and associated costs will be dictated by the final plat design in the area. Costs to improve the existing wastewater collection and pumping systems will be presented in the upcoming Wastewater System Study. As a result, these costs were not estimated in this study.

Study Area

The study area consists of approximately 1,117 acres in the southwest portion of the City. For purposes of discussion and utility systems evaluation, the study area was divided into two subareas. The two subareas are referred to as the "primary study area" and the "secondary study area". The primary study area is that portion of the study area where almost no development currently exists and consequently has no utilities presently servicing the area. The secondary study area is that portion of the study area that has partial development and full utility services.

The study area is divided into six land use categories. The land use categories are consistent with the City's Comprehensive Plan and are commercial, community service, single family residential, manufactured homes, multi-family residential and suburban residential.

Projected Population, Wastewater Flows and Water Demands

The projected full build-out population of the primary study area and the secondary study area is 5,480 and 1,490, respectively. The existing population of the secondary study area is estimated to be 875. The total projected build out population of the study area is estimated to be about 6,970.

Based upon the projected build out population of the study area, projected wastewater flow rates and water demands were estimated. Additionally, existing wastewater flow rates from the secondary study area were estimated. The projected full build out average annual wastewater flow rate from the primary study area and secondary study area is 575,000 gpd and 158,000 gpd, respectively. The existing average annual wastewater flow rate from the secondary study area is 96,000 gpd. Based upon the analysis, the total average annual wastewater flow rate from the study area is 733,000 gpd. The projected full build-out average daily water demand from the primary study area and secondary study area is 1.296 mgd and 417,000 gpd, respectively. The total study area build out average daily water demand is 1.71 mgd.

Necessary Improvements to the Existing Wastewater and Water Systems

Improvements to the existing wastewater and water systems identified as a result of this study are summarized hereafter. Some of the improvements are going to be required short-term before additional development can be placed on the systems, and other improvements are going to be needed long-term.

Existing Wastewater Collection and Pumping Systems Improvements

1. The pumps in the existing sewage lift station located at the intersection of Power Line and Carolina Roads that serves the South Hill area are presently at or have surpassed their rated hydraulic capacity and need to be replaced with larger pumps prior to any development being placed on the collection system.

2. The sewage lift station wet well is near its hydraulic capacity, and it will require improvements before an additional 25 equivalent residential units (ERUs) are placed on the system.

3. The 4-inch force main that crosses the Umatilla River will eventually have to be replaced with a 6 or 8-inch force main, depending on the type and size of the new pumps installed in the lift station.

4. The existing wastewater interceptor line has enough hydraulic capacity (273,000 gallons per day) to accommodate approximately a total of 1,000 ERUs (2,700 people). However, prior to full build out of the study area improvements to the interceptor will be needed. This interceptor line will be further evaluated in the upcoming Wastewater System Study.

Existing Water System Improvements

Water source improvements, either through development of additional wells or improvements to the existing wells, will be required before full build out of the study area occurs. At full build out of the study area, approximately an additional 2,900 gpm of source capacity will be needed.

Wastewater Collection and Water Distribution System Extensions

Wastewater collection and pumping and water system improvements necessary to provide sewer and water services to the study area at full build out have been identified as a result of the study.

Wastewater Collection and Pumping Systems

1. Two main interceptor lines and a sewage lift station (hereafter referred to as Stephens Avenue Lift Station) will be required.

2. Approximately 5,300 feet of 10-inch line and 13,750 feet of 8-inch line will be needed to provide sewer service to the study area at full build out.

3. At least one sewage lift station will be required depending on how the study area is developed. The Stephens Avenue Lift Station will be located in the vicinity of Stephens Avenue and the City Park near the foot bridge that crosses the Umatilla River. This lift station will be needed to service the northeast corner of the study area that lies generally north of the irrigation canal and east of the City limit line.

The 1997 estimated cost to complete the entire sewer system extension to service the area, not including the Stephens Avenue Lift Station, is $1.18 million (including contingencies, engineering, etc.), or $62 per lineal foot installed. The sewage lift station will cost an estimated $200,000 to install including the electrical controls, backup electrical generator and force main.

Water System

1. Four 12-inch water mains and a booster pumping station (hereafter referred to as the Coyote Booster Pumping Station) will be required.

2. Approximately 22,500 feet of 12-inch line will be needed to provide water service to the study area at full build-out.

3. The Coyote Booster Pumping Station will be necessary to serve the southern portion of the study area. The Coyote Booster Pumping Station would be constructed adjacent to the Coyote Reservoir and would pump water out of the reservoir to pressurize the "High Level Zone".

4. About 2 million gallons of additional water storage will be required by the time the study area has been fully built out. Presently, the system has adequate storage to service existing development within the study area, and the existing transmission and distribution systems appear to be adequate to handle some additional growth. However, this study did not assess the overall impacts to the entire water system by additional growth, and it is recommended that the City evaluate the capacity of the existing water system to handle the anticipated additional growth within Umatilla.

The 1997 estimated cost to complete the entire water system extension to service the area, not including the booster pumping station and the storage capacity, is $1.3 million (including contingencies, engineering, etc.), or $58 per lineal foot installed. The Coyote Booster Pumping Station will cost an estimated $325,000 including a standby emergency pump, electrical controls, and a building to house the station. The estimated 1997 cost of providing 2.19 million gallons of storage capacity is $1.1 million.

Water System Extension Project Schedule

Table ES-1 is a project schedule for completing the Power Line Road Water System Extension Project funded by the Hermiston Generating Company. As Table ES-1 indicates, the contract documents should be completed in January 1998 and the water line construction should be completed by June 1998. The actual schedule will be dictated by the Hayden River Estates development project schedule and the water line project will follow closely with the developer schedule for the road construction and paving. Construction of the water line must be completed by November 1998 or the City will lose the funds provided by the Hermiston Generating Company.

APPENDIX G

PUBLIC INVOLVEMENT

CITY OF UMATILLA
PUBLIC HEARING
OCTOBER 7, 1997

Mayor Hash opened the public hearing at 6:00 p.m.

Steve Anderson introduced Dr. Larry Esveldt of Esveldt Engineering who has been had been doing the processing planning on the wastewater improvements.

Dr. Esveldt explained that the timing of the wastewater improvements was important due to the prison initiating construction, and the need to process their wastewater. This was scheduled and due to get going anyway but was being expedited because of the critical nature of that project. They had actually started looking at the wastewater facilities and evaluated the capacity about 5 years ago. They found at the time, there was an increment of capacity that wasn't being used and the onion plant agreed to use that increment but no more than that. They also discovered at the time that the plant capacity was not what it was alleged to have been at the time of construction. At the time the package was put together, it was from a particular vendor of this type of system who had done some testing but not under the current expectations that we have for effluent. The palnt was designed to meet the standards set at the time but those standards have changed. Federal regulations have changed the standards for discharges into streams and the environment. With today's standards, the capacity of this plant to produce the effluent that is now needed is less than it was at the time. After 20 years of use, the plant is wearing out. The in fluent pumps are worn and the screen system is corroded and are in need of replacement. Biological treatment consists of pumping the wastewater following screening over a tower which has wooden media in it. Biological growth occurs on the wooden media and consumes the waste products that are in the wastewater. This type of media works well but typically after 12 to 20 years, biological growth takes over the whole thing and they plug up. The aeration system is wearing and the clarifying mechanism are also wearing out. The plant could last a few more years with good maintenance etc. but they also looked at the needs of the City over the next 20 years. With or without the prison impact the City would still need to maintain the items that are wearing out and increase the size of the plant as well. In addition to the changes in regulations to date, there are also additional regulation that are now starting to be implemented. Chlorine has been used to kill the bacteria before it goes into the river. The new regulations prevent the use of chlorine to kill the bacteria. Biosolids regulations have also changed to require more complete treatment so they become a usable entity. Dr. Esveldt explained the wastewater plant changes and modifications needed to increase capacity and to meet the DEQ regulations for treatment.

Steve Anderson then talked about the improvements to the southwest Umatilla lift station, force main, interceptor line and the interceptor lines in the McNary Industrial Park. The joint portion of the overall project to include the outfall and the treatment plant would be paid for by 3 entities - industry, commercial and residential users and the DOC. He also talked about the different funding options for the project.

Martin Davis explained that with the proposed projects in the area such as the proposed correctional facility, there has been a steady flow of developers. This has indicated there will be a lot of growth in Umatilla.

Three different options were discussed for financing of the City's portion of the project, depending on the outcome of the bond issue election on November 4, 1997. The three options were to place the entire obligation on property taxes, on user fees or a combination of part user fees and part taxes.

One citizen stated that he would prefer to have the entire obligation placed on taxes so that he would know exactly where he stands. Another citizen stated that she would prefer to have the entire obligation placed on user fees so that everyone shares in the cost instead of just the home owners.

CITY OF UMATILLA
PUBLIC HEARING
OCTOBER 21, 1998

Mayor Hash opened the public hearing at 6:00 p.m.

Steve Anderson talked about the wastewater system improvements. The system improvements include a pump station and force main from the McNary Industrial Park, a new interceptor line to serve both the prison as well as the new industries in the industrial park, a new force main and increasing the capacity of the lift station and interceptor line for the southwest area of the City, as well as the treatment plant and outfall. The cost of the project will be approximately $30.00 per month per user for sewer service or $360 per household per year for residential sewer service if the burden were to be placed on user fees alone. All sewer users would share in the cost. If the burden were placed on taxes the cost would be about $3.95 per thousand or about $395 per year on a $100,000 home. This would placed the burden on home owners, land lords and business owners. Tax exempt entities such as schools, churches, etc., would not share in the cost.

Frank Myrick, 414 Walla Walla Street, said that the fair way would be to place the burden on the users fees. Having such a high tax rate would be one way to stop future growth in Umatilla especially when non taxable entities would not be sharing in the cost. Placing it all on taxes would be the most unfair way.

Alan Burk said that getting everyone involved in paying their fair share and put it on the user fees instead of taxes would be the best way..

Tim Collins said that people have sacrificed a lot to get the homes they have and the taxes are a burden even with the last two measures that have passed. He is in favor of a more equitable way by splitting it up among everyone who has a toilet, waste disposal and a sink.

Robert Hojaboom said that if the rates were tied to the amount of water used, based on winter usage rather than year round use to properly reflect the amount that goes down the sewer, would be a more fair way and would probably get more support from the voters.

Mr. Collins responded that there are a lot of low income families with children having a lot of usage. That may put a lot of excess burden those families.

Bess Hanni, owner of the Umatilla Trailer Court, said that they have 30 sewer services and at $30 a month for each service would be outrageous. They couldn't and the people in the court could not afford it.

An unidentified woman stated that she was retired, disabled and lived in a subsidized house. Taxes or rates would push her out of her home. She lives alone and can't afford any increase.

APPENDIX H

CITY APPROVAL OF DRAFT WASTEWATER SYSTEM STUDY

CITY OF UMATILLA, OREGON
PUBLIC WORKS COMMITTEE

MINUTES OF
OCTOBER 10, 1997 MEETING
4:30 P.M. AT CITY HALL

Attendees:

City of Umatilla:	Mary Dedrick George Fenton Floyd Matthews Bonnie Parker
Department of Corrections:	Bob Schiedler
Anderson-Perry & Associates, Inc.:	Robin Harris Larry Esvelt (Esvelt Environmental Engineering)

Overview of Meeting:

- Discussed the fact that the new wastewater treatment plant will have doubled the capacity of the existing plant. The sizing criteria is based on the amount of loading, BOD and TSS, not flow. The City's NPDES Permit to discharge to the river is based on loading.

- Larry Esvelt pointed out that the existing wastewater treatment plant design flow is 0.7 MGD, which was derated from the original design flow, and that the City's flows have been below this. The problem is that the current average maximum month loading at the plant has been right at the treatment capacity of 1,300 PPD. That is why Roger says that if there were 0.7 MGD flow to the plant right now, the plant could not handle the treatment requirements.

  Floyd asked if the onion plant was running during that time, and Larry said "yes".

- The other important value discussed was the capacity of the existing plant to handle a peak day flow. Though it is hard to pin down directly, the peak day flow capacity of the existing plant is approximately 1.6 MGD, which is about half of what will be needed in the future. The proposed plant will be sized for 3.2 MGD, double your present capacity.

- Having the prison construction equalization storage tank to reduce peak flows was discussed. The problems with using an equalization basin to discharge during off peak times, such as late at night, is that the flow will not be diluted with other incoming flow when it reaches the plant and will create treatment problems. Also, it will create more maintenance including having an additional site to keep maintained and operating. The conclusion was that an equalization storage tank at the prison would not be beneficial for the City.

- The cost of the different treatment plant options were discussed. Robin Harris pointed out that approximately 50 percent of the project cost related to improvements necessary, regardless if there was growth in Umatilla and regardless if the prison were built. The improvements in this category related to permit violations, new treatment standards, facilities that should have been built in the past, and facilities that need to be replaced because of deterioration. Another ±25 percent of the project cost relate to hydraulic, growth, and aging issues. The remaining ±25 percent relates to treatment capacity.

- With the cost of upgrading the existing plant (Alternative 1) approximately equal to constructing a new oxidation ditch plant (Alternative 2), Anderson·Perry & Associates, Inc. recommended that the City construct the new oxidation ditch treatment plant because the oxidation ditch plant would have more flexibility for peak flows, treatment capability, and upgrading capability.

- George Fenton made the motion that the City follow the Consultant's advice and go with Alternative 2, the oxidation ditch treatment plant and with the draft study as presented. Mary Dedrick seconded. The committee was unanimous on the vote.

- A discussion of the collection system improvements and cost proceeded for the Southwest Umatilla Collection System Improvements. Floyd Matthews made the motion that the City follow the recommendation of Anderson·Perry & Associates, Inc. for the Southwest Umatilla Collection System Improvements. Mary Dedrick seconded the motion. The vote was unanimous. Mary Dedrick made the motion to follow the recommended McNary Collection System Improvements. George Fenton seconded, and the vote was unanimous.

- Also, funding was discussed for the project. Mary Dedrick voiced her concern about what would be the best way to fund the City's portion of the project, either through taxes, rates, or a combination of the two. It was pointed out that Steve Anderson would be giving the City some information about this at the next Council meeting. Robin Harris said that there is no perfect way that will met all citizens' needs and that the City will need to really listen to the citizens.

- Discussed having Steve Anderson go over the pros and cons for funding through taxes, rates, or a combination of taxes and rates, at the next Council meeting, and having Robin Harris go over the cost breakdown of the wastewater treatment plant improvements; improvements that need to be done regardless of growth; improvements needed because of hydraulics, growth, and aging; and improvements needed for the treatment capacity.

- Bonnie Parker clarified that George Fenton's motion included approving the draft wastewater study. George and Mary confirmed.

- The meeting was adjourned at approximately 6:30 p.m.

D:\DOCS\DOCCLIENTS\UMATILLA\Misc\pw-comm-cvt.wpd (10/16/97)

RESOLUTION NO. 14-98

A RESOLUTION ACCEPTING THE 1997 WASTEWATER SYSTEM STUDY COMPLETED BY ANDERSON PERRY & ASSOCIATES, INC. AND ESVELT ENVIRONMENTAL ENGINEERING

WHEREAS, the City of Umatilla is in the midst of facing major growth acceleration associated with four large projects planned in western Umatilla County, and;

WHEREAS, because of this expected growth and the associated development pressure in Umatilla, a study needed to be completed to evaluate Umatilla's utility needs, and;

WHEREAS, the City's existing wastewater treatment facility is operating in non-compliance with current state and federal regulations regarding discharge to the Columbia River sludge handling facilities, and;

WHEREAS, Anderson Perry & Associates, Inc. and Esvelt Environmental Engineering completed the study which addresses needed improvements to wastewater treatment and collection facilities.

NOW THEREFORE, the City of Umatilla does accept the 1997 Wastewater System Study completed by Anderson Perry & Associates, Inc. and Esvelt Environmental Engineering.

PASSED by the Council and **SIGNED** by the Mayor this 21th day of October, 1997.

ATTEST:

GEORGE HASH, MAYOR

Linda Gettmann, City Recorder

APPENDIX I

MEMORANDUM OF UNDERSTANDING WITH ODOC

RESOLUTION NO. 20-98

A RESOLUTION ENTERING INTO AND AUTHORIZING THE MAYOR TO SIGN A MEMORANDUM OF UNDERSTANDING WITH THE OREGON DEPARTMENT OF CORRECTIONS

WHEREAS, The City of Umatilla and the Oregon Department of Corrections are entering into a Memorandum of Understanding for the purpose of developing water and wastewater infrastructure related to Two Rivers Corrections Facility.

NOW, THEREFORE BE IT RESOLVED, that the Umatilla City council approves and authorizes the Mayor to sign a Memorandum of Understanding between the City of Umatilla and the Oregon Department of Corrections for the purpose of developing water and wastewater infrastructure related to Two Rivers Corrections Facility.

PASSED by the City Council and **SIGNED** by the Mayor this 2nd day of December, 1997.

ATTEST: GEORGE HASH, MAYOR

Linda Gettmann, City Recorder

4. Non-Appropriation (City). In the event sufficient funds shall not be appropriated by the City for the City's continued operation and maintenance of the infrastructure to be owned and operated by the City for the service of the corrections facility under this Memorandum of Understanding, the Department may terminate this Memorandum of Understanding, or any part thereof, in accordance with Paragraph I (2), of this Memorandum of Understanding.

II.

Department's Establishment of Facility

1. Construction of Facility. The Department shall be responsible for the acquisition of land, design, awarding of contracts, and the administration of the correctional facility construction project approved by the Department. The Department's obligation to construct the facility shall at all times be contingent on the ability of the State of Oregon, acting by and through its Department of Administrative Services, to obtain certificate of participation financing for the facility on terms satisfactory to both departments and the Office of the State Treasurer.

III.

City's Establishment of Sewage Treatment and Water Supply Infrastructure

1. Construction of Infrastructure. The City shall be responsible for the acquisition of land, design, awarding of contracts, and the administration of any contracts necessary for the installation, construction, reconstruction or acquisition of water and wastewater improvements, subject to review by the Department, for serving the facility. The City's obligation to provide the infrastructure shall at all times be contingent on the ability of the State of Oregon, acting by and through its Department of Administrative Services, to obtain certificate of participation financing for the state's contribution to the costs of financing the City's infrastructure improvements and equipment on terms satisfactory to both departments and the Office of the State Treasurer.

2. Maintenance and Operation of City Infrastructure. Throughout the term of this Memorandum of Understanding, the City shall continue to operate, maintain, and provide the utilities and services required for the operation of the institution.

3. Sewage Treatment Infrastructure and Services. The sewage collection and treatment improvements and fixtures to be established, maintained, and operated by the City under this Memorandum of Understanding shall meet or exceed the capacity sufficient to service the population of the institution estimated to be 100-300 minimum and approximately 1600 medium custody inmates and necessary associated employee, contractor and visitors of the institution. The infrastructure improvements to be constructed by the city shall be as outlined in a Wastewater System Study draft dated Oct. 1997 prepared by Anderson Perry and Associates Inc. and subject to approval of the Department.

4. Water Supply Infrastructure and Services. The water supply improvements and fixtures to be established, maintained, and operated by the City under this Memorandum of Understanding shall meet or exceed the quality and capacity necessary to serve the population of the institution as outlined in 3 above. The improvements necessary to meet the needs of the institution shall be as identified in a Water Master Plan presently being developed for the City, such Master Plan is subject to approval by the Department.

APPENDIX J

USDA ENVIRONMENTAL REVIEW

United States
Department of
Agriculture

Rural Utilities
Service

101 SW Main St., Suite 1410
Portland, OR 97204-3222
PHONE (503) 414-3364
FAX (503) 414-3397

COPY

RECEIVED

JAN - 8 1998

December 31, 1997

Ms. Angie Hernandez
U.S. Fish and Wildlife Service
Oregon State Office, ESS
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266

RE: City of Umatilla; Proposed Wastewater System Improvements Project; ESA Species List

Dear Ms. Hernandez:

Rural Utilities Service (RUS) has received an application for financial assistance from the City of Umatilla for their proposed Wastewater Treatment System Improvements project. The project would include: 1) replacing the existing biological treatment units with oxidation ditch activated sludge treatment; 2) influent pretreatment facilities; 3) an upgraded pumping station to meet design flows; 4) effluent disinfection improvements; 5) facilities for sludge handling; 6) existing outfall extension of approximately 250 feet along Columbia River bottom; 7) laboratory, maintenance, and safety improvements; and 8) improvements to the McNary and South Hill collection systems.

The applicable Township, Range, and Section numbers for this project are:

- **Township 5 North, Range 27 East, Sections 12, and 13;**
- **Township 5 North, Range 28 East, Sections 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 29; and**
- **Township 5 North, Range 29 East, Section 7**

For further information, I am also enclosing a brief project description, project area map (topo map), a wetlands delineation map, and a soils map.

RUS is required to assess the potential environmental impacts of a proposed action prior to commitment of federal financial resources to the project. This environmental assessment is consistent with the Council on Environmental Quality's (CEQ) Regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA). A specific aspect of this process is to assess any potential impacts the proposed project may have on endangered or threatened species in the project area.

APPENDIX K

FINANCIAL CORRESPONDENCE

U.S. Department of Commerce
Economic Development Administration
121 S.W. Salmon Street, Room 244
Portland, Oregon 97204
(503) 326-3078 FAX (503) 326-6351
aberblin@orednet.org

September 19, 1997

Ms. Bonnie Parker
City Administrator
City of Umatilla
Box 130
Umatilla, Oregon 97882

Dear Ms Parker:

This is to follow up on some points discussed at our meeting on Tuesday concerning improvements to the city's sewer system. At that meeting I invited a preapplication for EDA assistance for the interceptor portion of the overall project. I understand that the Oregon Department of Corrections will pay for the cost of an interceptor sized to meet the needs of the new prison. However, the city and the Port of Umatilla want to size the line to meet the needs of tenants of the Port's industrial park, which is located adjacent to the prison site. The purpose of EDA assistance would be to provide part of the extra cost of sizing the line larger than Corrections would require for their needs.

EDA would prefer a project with the city as applicant, potential grantee, owner, and operator of the line. We would not recommend a design/build approach. The ideal for us would be:

- a city project with a cash contribution to the city from Corrections for their fair share. (An arrangement in which Corrections disbursed their share of the project as the funds were needed would be acceptable - they would not have to send you a check up front.)
- a match for EDA in the form of a loan from the Oregon Special Public Works Fund
- a competitive process for selection of the contractor for final engineering and a sealed bid process for the construction contract.

I spoke to David Tovey this morning about the potential of this project to serve the Tribe's industrial land as well at the Port's. He said he would get in touch with Steve Anderson about the Tribe's plans for this property.

Call if you have questions!

Sincerely,

Anne S. Berblinger
Economic Development Representative

cc: Larry Burr, EDA
Steve Anderson
David Tovey

USDA United States Department of Agriculture

Rural Development

1229 SE 3rd St., Suite #1
Pendleton, OR 97801-4198
PHONE (541) 278-0350
FAX # (541) 278-8048
Office Hours 8:00 - 4:30 PM
TTY # (503) 414-3387

December 10, 1997

Anderson, Perrry & Associates, Inc.
Attn: Steve Anderson
P O Box 1107
LaGrande, OR. 97850

Dear Steve,

This confirms our conversation of last week regarding our funding availability and processing schedule for the remainder of Fiscal Year 98.

We have approximately $21,000,000 in loan and $13.6 million in grant applications in Oregon, with bond issues in place, that we anticipate funding between now and March 1998. This leaves about $2.76 million loan funds and $2.77 million in grant funds to be competed for by 9 communities that are working on getting bond approval and are CERT priority projects. This group includes Umatilla. Grant funds can be traded for loan funds at a rate of approximately $10 dollars for $1 of grant. Based on what we know now. If Umatilla had a bond fully authorized by February 1st, it looks like they would have a reasonable chance to compete for FY 98 Funding- if the rest of the package is ready to go.

If you waited to a March Election it is doubtful funds would be available and by May there would be virtually no chance of FY 98 Funding.

The funding picture for a project of this size looks bleak beyond 1998, since we anticipate losing about 2/3 of our funding when the Presidents Timber Initiative Funding ends in Sept., 1998. Current regulations indicate that we should skip over projects which would take more than 25 % of our annual funding- that means projects over $3.50 million will likely not be funded by Rural Development after this year.

Please share this information with the Umatilla Mayor, Council and interested parties. If any one has questions have them call me. This information is of course just estimates based on the information I have today.

Also be sure to consider DEQ-SRF as an alternative since they have competitive rates and do not require bonds.

Sincerely,

Dale R. Carr
Rural Utilities Specialist

CC: RUS Program Director, Portland, OR.

CITY OF UMATILLA

300 6th Street • P.O. Box 130 • Umatilla, OR 97882
(541) 922-3226 • Fax (541) 922-5758

MEMO

DATE: January 13, 1998

TO: Steve Anderson

FROM: Martin Davis

SUBJECT: Wastewater Services to the Port Industrial Park

Bonnie said that you discussed this project yesterday and that you needed something in writing regarding the funding scenario for the force main and up sizing of the "DOC" interceptor. As I see it today, funding for these improvements will be as follows:

1) 60% from an EDA grant
2) $50,000 from Fluor-Daniel (Grant)*
3) Balance from our SPWF loan that will be repaid by the Port Industries using these services

*Staff from Fluor's Office of Economic Transition have shown strong support for this project and indicated that we should have a commitment letter in 30 days.

I believe this is what you discussed with Bonnie in terms of who would be participating and at what level, but please feel free to call if you have any questions.

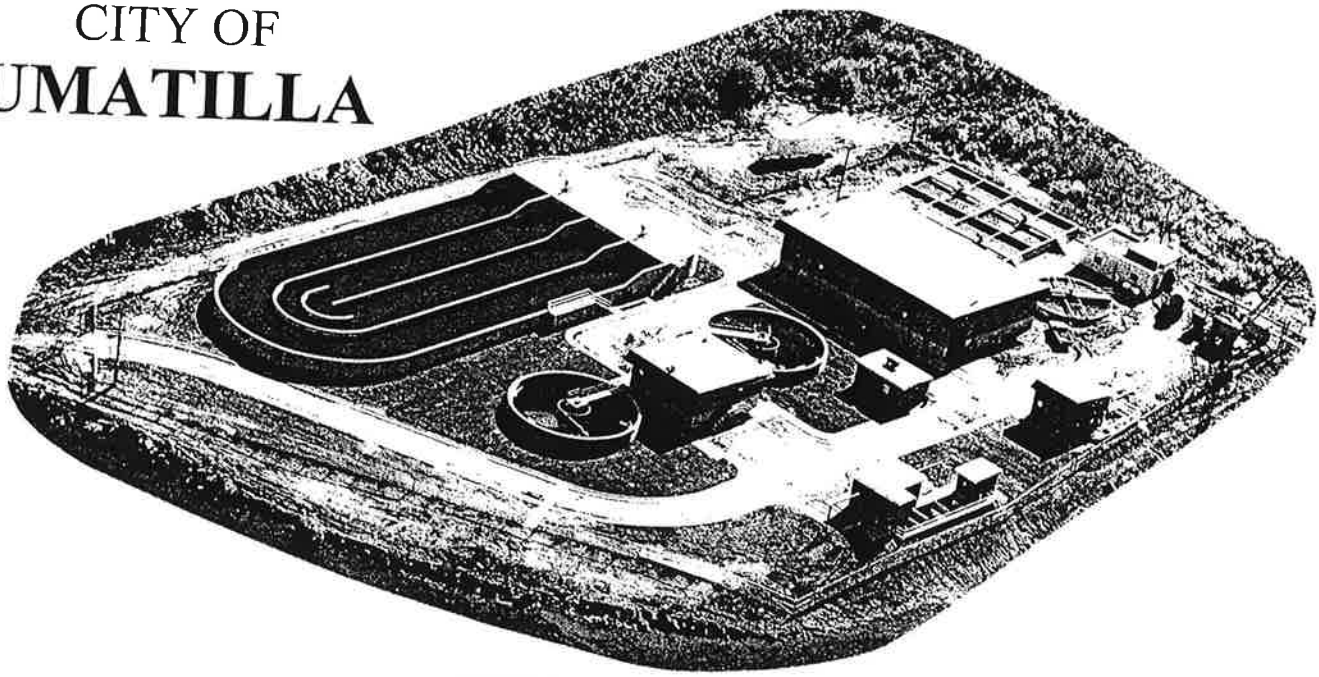
CITY OF UMATILLA
Umatilla, Oregon 97882

P.O. Box 103
300 6th Street
Phone (541) 922-3226

TO: UMATILLA AREA RESIDENT
UMATILLA, OREGON 97882

IMPORTANT WASTEWATER NOTICE

CITY OF
UMATILLA



BOND ELECTION
FOR
WASTEWATER SYSTEM IMPROVEMENTS

A BROCHURE OF FACTS
presented by the
CITY OF UMATILLA

CITY OF UMATILLA, OREGON
BOND ELECTION FOR
WASTEWATER SYSTEM IMPROVEMENTS

A BROCHURE OF FACTS

PRESENTED BY
THE CITY OF UMATILLA

INTRODUCTION

On November 4, 1997, the City Council of the City of Umatilla, Oregon will ask the citizens of Umatilla to approve the sale of $5.25 million in General Obligation Bonds to finance the City's share of a major upgrading project on the City's Wastewater Collection and Treatment Facilities. Public information meetings will be held on both October 7 and October 21, 1997 at 6:00 p.m. at the Umatilla City Hall to discuss the various elements of the project and answer questions. In addition, meetings will be held with various groups throughout the community during the first part of October to present information and answer questions concerning the project. The following information is presented by the Umatilla City Council to help explain the need for this project in more detail.

1. Question: Why do the City's present collection and treatment facilities need upgrading?

The City received a Notice of Permit Violation from the Oregon Department of Environmental Quality on June 30, 1997 that could have involved penalties to the City. The City's wastewater treatment plant is in need of major improvements regardless of whether any growth occurs in the Umatilla service area. Several factors indicate improvements and upgrading are needed:

Age: The facilities were last upgraded 20 years ago (1977-78). Many of the components are now at the end of their expected life. Those components that are at the end of their life and are in need of replacement or renovation include the following:

- Influent Pump Station - Pumps are nearly worn out, pump and piping capacity is now deficient for future peak flows.
- Influent Screens - Corrosion and support deterioration make these facilities in need of complete replacement.
- Biological Treatment Tower - The media inside the tower needs replacement in order to overcome progressive clogging and deterioration, which includes the media coming apart due to corrosion of fasteners.
- Clarifier Mechanisms - Corrosion and wear requires renovation or replacement.

Changes in Regulations: Regulations for discharges to surface waters (Columbia River) and for disposal of sludge (biosolids) have been changed since construction of the treatment facilities:

- Receiving Water Quality Based Regulations for Dischargers Require that Toxic Materials in Discharges be Limited - Chlorine residual in the effluent is no longer allowable and either dechlorination facilities or a change in disinfection method is required.

- Receiving Water Dilution - The outfall from the treatment plant is no longer adequate since it does not extend into the river far enough to assure consistent dilution year-round. The end of the outfall is exposed at low water.

- Sludge Treatment - Regulations for land application of sludge (biosolids) requires additional stabilization, and dewatering, if the solids are to be put to beneficial use.

- Testing - Additional testing requirements necessitate more adequate laboratory facilities.

Other Inadequacies: The efficiency of the treatment plant and facilities can be enhanced by other improvements:

- Maintenance Facilities - Maintenance facilities consist of a converted trailer. Current and anticipated workloads demand that more adequate facilities be provided to make the most effective use of operator time.

- Laboratory Facilities - Current lab facilities and equipment are small and inadequate for projected laboratory testing requirements to comply with the NPDES discharge permit.

- Grit Removal Facilities - There are currently no grit removal facilities in the treatment plant. Grit causes excessive wear on pumps, piping, mechanical equipment and other plant components.

- Sludge Handling - Sludge dewatering is needed to reduce the transportation time and cost for the waste sludge, whether they are transported to land application (soil amendment) or elsewhere for disposal.

Although the cost of the anticipated improvements is high, the City has a need to correct these problems with the existing treatment plant while constructing additional capacity to accommodate expected growth in the area, and also accommodate expected flows from the new Two Rivers Correctional Facility. Because of the economies of scale, the City will be sharing the cost of this new and improved facility, capable of treating the wastewater from both the residential and commercial users within the City and the new correctional facility, with the Oregon Department of Corrections. The City is also working with the Port of Umatilla and other agencies to try to secure funding to provide additional trunk sewer capacity and capability within the new plant to treat wastewater from Gilroy Foods and industries yet to locate within the McNary Industrial Park. Under no circumstances will voters of the City of Umatilla be paying for wastewater treatment capacity for industries or for the Two Rivers Correctional Facility.

2. ***Question: Will City residents be paying for the Prison's share of the project?***

Again, the answer is no, City residents will not be paying for the Prison's share of the project. Fortunately for the City, the Oregon Legislature recently expanded legislation that allows the Department of Corrections to sell "Certificates of Participation" to pay the up-front costs of capital improvements such as those now being planned to serve the Two Rivers Correctional Facility. The Department of Corrections will be paying both their proportionate share of the capital costs of the wastewater treatment facilities and the trunk sewer line, as well as their proportionate share of the ongoing monthly operation and maintenance costs of the City's facilities. None of these costs will be borne by the residents of Umatilla.

3. **Question: How can the Umatilla School District finance almost twice as much, some $10.3 million, at roughly the same tax rate as the City's wastewater bond?**

The School District's boundaries are much larger than the City Limits and encompass nearly twice as much property in terms of total value. This spreads the cost of their bond issue over a much larger taxpayer base. In addition, they are refinancing their existing debt and are prepaying some future expenses out of the bond issue. This combination has allowed them to present a package that will cost District taxpayers $3.93/thousand. The City's projected bond cost, if all of the new debt were placed on taxes, would be about $3.95/thousand.

4. ***Question: Will the project expand the capacity of the existing plant and allow for more growth?***

Yes, the plant will be expanded to accommodate the current population, as well as anticipated growth in Umatilla over the 20-year planning period. The projected future 20-year population for the City of Umatilla would be 6,000 people. The plant will also have the capability of accommodating the Department of Corrections new Two Rivers Correctional Facility. Additional capacity may also be added to accommodate Gilroy Foods and anticipated future growth in the McNary Industrial Park. The funding for this industrial component is uncertain at this time and, if funds cannot be developed, that component will not be included in the final design of the facility.

5. ***Question: What would the cost of the facility be, what outside funding sources are available, and what would the City's share be?***

The estimated cost of the expanded wastewater treatment facility to serve the City of Umatilla and the Two Rivers Correctional Facility is approximately $8.8 million as outlined in a preliminary draft of a Wastewater System Study now being completed for the City. Collection system improvements within the City of Umatilla are estimated to cost $0.6 million. The estimated cost of a new trunk sewer line and sewage lift station to serve the McNary Industrial Park and the Two Rivers Correctional Facility is estimated at approximately $1.9 million. The City would be providing no funding for these latter facilities, since the City's present trunk line serving the McNary area has the capacity to handle growth in that area for the 20-year planning period. The City's anticipated share of the cost of these facilities is expected to be between $6 and $6.7 million. Outside funding sources being actively sought by the City include grant and loan monies through USDA's Rural Development Agency, grant monies through the Oregon Economic Development Department's Community Development Block Grant (CDBG) Program, loan monies through the Oregon Department of Environmental Quality's State Revolving Fund, and grant monies through the U.S. Department of Commerce Economic Development Administration. The City is in an excellent position to receive a $5 million loan and $1 million grant through Rural Development to provide the majority of the local funding needed for the project. Grant funding through the CDBG Program and other sources will be sought if necessary.

6. ***Question: How will the local share be financed?***

Because this funding matter will be placed before the voters, the City can issue General Obligation Bonds for construction of the needed improvements. Portions of these bonds can be paid for through increased revenues from sewer user charges, as well as from property tax assessments.

The Council must decide how much of the debt must be repaid from increases in monthly user charges (presently at $15.55 per month) and how much would be repaid from property taxes. With approximately 1,700 equivalent residential users on the system, and an assessed valuation projected of approximately $75,000,000 in Umatilla, several of the many financing options that could be considered by the Council are:

	100% on Taxes None on Rates	50% on Taxes/ 50% on Rates	25% on Taxes/ 75% on Rates	None on Taxes/ 100% on Rate
Equivalent Residential User Rate (Average Month)	$15.55*	$22.80	$26.40	$30.00
Portion on Property Taxes	$3.95/Thousand	$1.98/Thousand	$0.99/Thousand	$ 0.00

*Current Monthly Residential Sewer Rate

7. ***Question: This seems like a lot of money. How will these costs compare to other Eastern Oregon Communities?***

A number of Oregon Communities have recently upgraded, or are in the process of upgrading, their wastewater collection and treatment facilities. The cost to the residents of Umatilla for the ongoing operation and maintenance of the new facilities, as well as the retirement of the debt for these new facilities, will be approximately $30 per month per "equivalent residential user". This $30 per month amount is a common requirement of most agencies providing low interest loan and grant monies for construction of such facilities. Other Oregon communities who are upgrading their facilities and have similar charges for wastewater collection, treatment, and disposal include the Cities of Cascade Locks, Madras, Irrigon, and Ontario. Communities who will be facing similar monthly user charges in the future will include Boardman, Vale, and Burns. Because of their size, the larger communities may be able to keep these charges within the $25 per month range, but smaller communities like Umatilla will all be facing similar charges to those presently needed to fund this project.

8. ***Question: How do we know the proposed project will identify all of the problems that exist in the system?***

The City is presently undertaking the development of a comprehensive system-wide Wastewater System Study to identify all of the deficiencies within the City's present system and develop a plan for resolving these deficiencies. This study is funded with a $55,000 low interest loan the City acquired through the State Revolving Fund Program of the Oregon Department of Environmental Quality. A draft of this plan is now being published. Before this plan is adopted by the Council, public review and input will be sought to help assure its completeness. Final adoption of the plan will be considered by the Council in November, after the outcome of this local bond election is known.

9. ***Question: What will happen if the bond election is defeated? Will the project be delayed if this occurs?***

The City Council will make a determination of a course of action to be followed if the bond election is defeated, and this course of action will be based upon the public input received at that time. Because the Council is hopeful of timing the improvements needed by the City at the existing Wastewater Treatment Facility with the expansion needed by January 1, 2000 to accommodate the wastewater from the new Two Rivers Correction Facility, one option the Council may pursue is to secure a portion of the monies needed to begin the final design work from other sources not requiring voter approval and then request approval of the financing for the project from the voters in March 1998. This plan would allow the project to proceed without delay, with a targeted start-up date of the new treatment facilities of January 1, 2000.

If no voter approval can be obtained for the City's share of the project, the Council could elect to sell revenue bonds, thereby placing the burden of all of the debt retirement on the rate payers, something the City of Umatilla has not done historically.

10. Question: Can revenues generated from the bond sale be used for anything other than the wastewater system improvements?

No, they cannot. In the prospectus prepared by an independent Bond Counsel and presented to the Umatilla County Clerk, the improvements to be constructed have been generally described. Use of these monies for purposes other than as outlined in this bond prospectus are not allowed under Oregon law.

11. Question: What can I do to learn more about the proposed project?

Plan on attending either of the public information meetings on Tuesday night, October 7, or October 21, 1997 at 6:00 p.m. at City Hall to find out more about the project, or stop by and talk to Bonnie Parker or Roger Frances at City Hall. You might also pay a visit to the wastewater treatment facility. When visiting the facility, note the minimal prescreening facilities in the lines coming into the plant, including the hand raking necessary to maintain these facilities, the deteriorated condition of the structure housing the solids separation facilities because of severe corrosion of the timber connector plates, the small size of the control room and the laboratory facilities, and the temporary nature of the shop and maintenance facilities. Whatever you do, please be sure to mark your ballot and return it to the County Clerk before November 4, 1997 so that you can have a say on this important issue facing the citizens of the City of Umatilla.

BALANCING
ECONOMIC STABILITY WITH
ENVIRONMENTAL RESPONSIBILITY

APPENDIX L

GENERAL OBLIGATION BOND

NOTICE OF BOND ELECTION

City of Umatilla
Umatilla County, Oregon

NOTICE IS HEREBY GIVEN that on November 4, 1997, an election will be held in City of Umatilla, Umatilla County, Oregon. The following question will be submitted to the qualified voters thereof:

CITY OF UMATILLA

CAPTION:

GENERAL OBLIGATION SEWER BOND AUTHORIZATION

QUESTION:

Shall the City be authorized to contract a general obligation bonded indebtedness in an amount not to exceed $5,250,000? If the bonds are approved, they will be payable from taxes on property or property ownership that are not subject to the limits of Sections 11 and 11b of Article XI of the Oregon Constitution.

SUMMARY:

This measure may be passed only at an election with at least a 50 percent voter turnout. The total costs of sewer system improvements are estimated to be $10,000,000. The City has applied for federal and state loans and grants and this measure, if approved, would authorize the City to issue general obligation bonds to pay the balance of the cost. Bonds will be sold only in an amount necessary to complete the financing, but in no event more than $5,250,000. Ad valorem taxes may be levied without limit as to rate or amount to pay debt service; however, the City will also use available sewer revenues to pay the bonds. Bond proceeds would be used to expand and improve the City's sewer treatment plant, interceptor lines, pump stations and related facilities; acquire real property as necessary; and pay all costs incidental thereto. The bonds would mature over a period not less than 20 and not more than 40 years.

City of Umatilla

Administrator

RESOLUTION NO. 07-98

A RESOLUTION OF THE CITY OF UMATILLA, UMATILLA COUNTY, OREGON, CALLING A SPECIAL ELECTION TO SUBMIT TO THE VOTERS THE QUESTION OF CONTRACTING A GENERAL OBLIGATION BONDED INDEBTEDNESS IN THE AMOUNT OF $5,250,000 TO EXPAND AND IMPROVE THE CITY'S SEWER TREATMENT PLANT, INTERCEPTOR LINES, PUMP STATIONS AND RELATED FACILITIES; ACQUIRE REAL PROPERTY AS NECESSARY; AND PAY ALL COSTS INCIDENTAL THERETO.

WHEREAS, the City Council of City of Umatilla, Umatilla County, Oregon (the "City"), has determined that there is a need to expand and improve the City's sewer treatment plant, interceptor lines, pump stations and related facilities; acquire real property as necessary; and pay all costs incidental thereto; and

WHEREAS, the costs to be financed with bond proceeds are estimated to be $5,250,000, all of which are costs of capital construction or improvements or costs of issuing bonds; now, therefore,

BE IT RESOLVED, by the City Council of the City of Umatilla, Umatilla County, Oregon, that:

A. The total cost of sewer system improvements is estimated to be $10,000,000. The City has applied for federal and state loans and grants and this bond measure, if approved, would authorize the City to issue general obligation bonds to pay the balance of the cost. Bonds will be sold only in an amount necessary to complete the financing, but in no event more than $5,250,000. Ad valorem taxes may be levied without limit as to rate or amount to pay debt service; however, the City will also use available sewer revenues to pay the bonds. Bond proceeds would be used to expand and improve the City's sewer treatment plant, interceptor lines, pump stations and related facilities; acquire real property as necessary; and pay all costs incidental thereto. The bonds would mature over a period of not less than 20 and not more than 40 years;

B. A special election is hereby called for the purpose of submitting to the qualified voters of the City the question of contracting a general obligation bonded indebtedness in the name of the City in a sum not to exceed $5,250,000;

C. The special election hereby called shall be held in the City on November 4, 1997. The election shall be conducted pursuant to ORS 254.465 et seq.;

D. The City Administrator shall cause to be delivered to the Election Officer of Umatilla County, Oregon the attached Notice of Bond Election, not later than 61 days prior to

the election. The Election Officer is requested to give the electorate of the City notice that the election shall be conducted pursuant to Oregon law at the polls;

E. That the City Administrator shall give notice of the election by publishing Notice of Bond Election two times at least 10 days prior to the election in the *East Oregonian.*

ADOPTED by the City Council of City of Umatilla, Umatilla County, Oregon on August 19, 1997.

City of Umatilla

George Staab

Mayor

Attest:

Administrator

APPENDIX M

SEWER REVENUE BOND

RESOLUTION NO. 18-98

A RESOLUTION OF THE CITY OF UMATILLA, UMATILLA COUNTY, OREGON, AUTHORIZING THE ISSUANCE OF SEWER REVENUE BONDS FOR A TOTAL OF NOT TO EXCEED $5,250,000 AND PROVIDING FOR PUBLICATION OF NOTICE.

The City Council of the City of Umatilla, Oregon (the "City"), finds:

A. The City finds that it is financially feasible and in its best interests to expand and improve the City's sewer treatment plant, interceptor lines, pump stations and related facilities; acquire real property as necessary; and pay all costs incidental thereto (the "Project").

B. The City is authorized to finance the Project by issuing revenue bonds pursuant to Oregon's Uniform Revenue Bond Act (ORS 288.805 to 288.945) (the "Act").

C. The total cost of sewer system improvements is estimated to be $10,000,000. The City has applied for federal and state loans and grants and this bond measure would authorize the City to issue revenue bonds to pay the balance of the cost. Bonds will be sold only in an amount necessary to complete the financing, but in no event more than $5,250,000.

D. The City will cause to be prepared a plan showing that the City's revenues to be pledged are sufficient to pay the estimated debt to be incurred by the City under the revenue bond issue authorized by this resolution.

The City Council of the City of Umatilla, Oregon, resolves:

Section 1. Revenue Bonds Authorized. There are hereby authorized to be issued in not to exceed $5,250,000 aggregate principal amount of the City's Sewer Revenue Bonds. Prior to selling the bonds the City Council shall establish by resolution:

(a) Whether the bonds shall be sold at public competitive bid sale or private negotiated sale;

(b) The maximum discount to be allowed upon sale of the bonds;

(c) The schedule for bonds principal repayment;

(d) The terms under which additional bonds may be issued;

(e) The terms by which bonds may be redeemed prior to maturity;

(f) The amount of any reserves to be established for the bonds and the manner in which the reserves shall be funded;

(g) The covenants which the City will make with bondowners regarding operation of the Project;

(h) The revenues to be pledged to payment of the bonds;

(i) Whether the pledged revenues shall be held by a trustee, and if they are so held, the trustee's duties;

(j) Whether security interest should be granted; and

(k) Any other terms, conditions or covenants regarding the bonds, the Project or the revenues which are necessary or desirable to effect the sale of the bonds.

Section 2. Notice; Procedure.

(a) No bonds may be sold, and no purchase agreement for the bonds may be executed, until at least sixty (60) days after publication of the Notice of Revenue Bond Authorization, which is attached to this resolution as Exhibit "A" (the "Notice"). The Notice shall specify the last date on which petitions may be submitted, and shall be published in at least one newspaper of general circulation in the City in the same manner as are other public notices of the City.

(b) If petitions for an election, containing valid signatures of not less than five percent (5%) of the City's electors, are received within the time indicated in the Notice, the question of issuing the bonds shall be placed on the ballot at the next legally available election date. If such petitions are received, no bonds may be sold until this resolution and the question of issuing the bonds is approved by a majority of the electors of the City who vote on that question.

(c) The bonds shall be issued and sold in accordance with the Act.

Section 3. Bonds Payable Solely from Revenues.

The bonds shall not be general obligations of the City, nor a charge upon its tax revenues, but shall be payable solely from the revenues which the City pledges to payment of the bonds pursuant to ORS 288.825(1) and the resolution to be adopted by the City pursuant to Section 1 of this resolution.

ADOPTED by the City Council of the City of Umatilla this 2nd day of December, 1997.

George Hash
GEORGE HASH, MAYOR

ATTEST:

Linda Gettmann
Linda Gettmann, City Recorder

EXHIBIT A
Notice of Revenue Bond Authorization

NOTICE IS HEREBY GIVEN that the City Council of City of Umatilla, Umatilla County, Oregon (the "City"), adopted Resolution No. 18-98 on December 2, 1997, authorizing the issuance of sewer revenue bonds. The bonds will be issued to finance to expand and improve the City's sewer treatment plant, interceptor lines, pump stations and related facilities; acquire real property as necessary; and pay all costs incidental thereto (the "Project").

The City Council may establish by subsequent resolution all terms, conditions and covenants regarding the bonds and the revenues to be pledged which are necessary or desirable to effect the sale of the bonds.

The total cost of sewer system improvements is estimated to be $10,000,000. The City has applied for federal and state loans and grants and this bond measure would authorize the City to issue revenue bonds to pay the balance of the cost. Bonds will be sold only in an amount necessary to complete the financing, but in no event more than $5,250,000. Bond principal and interest are expected to be paid from City revenues. The bonds will not be general obligations of the City, nor a charge upon its tax revenues, but will be payable solely from the revenues which the City pledges to the payment of the bonds.

If written petitions, signed by not less than five percent (5%) of the City's electors, are filed at the Office of the City Recorder on or before February 1, 1998 (the 61st day after the date of publication of the notice), the questions of issuing the revenue bonds shall be placed on the ballot at the next legally available election date.

The Office of the City Recorder is located at 300 Sixth Street, Umatilla, Oregon 97882.

The resolution authorizing the bonds is available for inspection at the Office of the City Recorder.

The bonds will be issued and sold under the Uniform Revenue Bond Act (ORS 288.805 TO 288.945); this Notice is published pursuant to ORS 288.815(6).

BY ORDER OF THE CITY COUNCIL OF CITY OF UMATILLA, UMATILLA COUNTY, OREGON.