WASTEWATER SYSTEM FACILITIES PLAN, PHILOMATH, OREGON

July 2004

Prepared for:

CITY OF PHILOMATH, OREGON
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Philomath, OR 97370

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Exp 6/30/2006

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EXPIRES: 12/31/2005

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August 23, 2004

Mr. Beau Vencill, Public Works Director
City of Philomath
P.O. Box 400
Philomath, OR 97370

RE: Philomath Wastewater System Facilities Plan Approval
File No. 103463
Benton County

Dear Mr. Vencill:

We have received the revised Philomath Wastewater System Facilities Plan (FP) prepared by Westech Engineering, Inc. and received in our office on July 29, 2004.

The revisions to the FP address all our comments. Therefore, we are approving the revised document. For the record, the City has chosen not to address environmental issues as required if state or federal funds are sought for this project at this time.

The next step is to start pre-design work. To avoid extra work and cost overruns, the County should not authorize final design until a pre-design report is reviewed and agreed by City staff and DEQ.

Should the implementation of this FP lapse over five years, we strongly recommend that you consult with DEQ staff to ensure that the proposed plan and issues are still relevant. It is sometimes possible that preparation of a new FP may be warranted after five years.

Please feel free to call me at [541] 686-7838 ext.233 should you have any questions or comments.

Sincerely,

Jaime Isaza

Jaime Isaza, Project Officer

cc: John Yarnall - Westech
Keith Andersen, Mark Hamlin, Tim McFetridge - DEQ

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FOREWORD

USING THIS REPORT

Because this report will be used by many people whose needs for detailed information will differ widely, an Executive Summary has been included at the beginning of this report. This executive summary contains a summary and overview that briefly describes the content and main conclusions of the report. Thus, readers may gain a good general understanding of the direction of the report and its contents by reading the Executive Summary. If a reader wishes to explore the subject in greater detail, the appropriate section in the text can be consulted. Each section has also been generally organized so as to move from the general to the specific.

CITY OF PHILOMATH
Wastewater System Facilities Plan,
Philomath, Oregon

Executive Summary
July 2004

PURPOSE OF FACILITIES PLAN

This Wastewater Facilities Plan was completed to achieve the following objectives;

- **Evaluate Current and Future Needs** – Evaluate the City's sanitary sewerage facilities with respect to existing and future needs, identify improvements and associated costs necessary to meet those needs, and provide the City with a guide for future development of the City's sanitary sewerage system.

- **Satisfy Funding Agency Requirements** – As with most small cities, Philomath may have some difficulty accumulating sufficient resources to construct the required improvements. Therefore, outside funding may need to be acquired. The federal and state funding agencies that distribute funds for public wastewater projects have published guidelines for the preparation of Facilities Plans. This plan is intended to conform to those guidelines.

BACKGROUND INFORMATION

Philomath's original sewer system was built in 1952. It served most of the area within the present City limits west of Newton Creek. Concrete, mortar joint pipe was used for the sewer construction. Two sewage lift stations were built at that time. One was located at the sewage treatment plant and was intended to lift all sewage into the treatment plant. This was known as Pump Station A. At that time the sewage treatment plant was located at the City shops facility near the south end of 16th Street. A second lift station was constructed near the High School on Applegate Street. This lift station, known as Pump Station B, originally served the portion of the City east of 16th Street on the north side of Main Street and all of the area east of 19th Street on the south side of Main Street. Pump Station B discharged through a force main into Manhole #117 on Applegate Street where sewage flowed by gravity to Pump Station A. Pump Stations A and B essentially divided the City into two distinct drainage basins. This configuration remained until the mid 1980's, when large-scale sewer improvements were constructed.

In 1985, the capacity of Pump Station A was increased. In 1986 the City constructed large-scale sewerage system improvements that changed the overall configuration of the collection and treatment system. As part of this project, Pump Station B was abandoned. Flows from the collection system that originally drained to Pump Station B were rerouted to a new pump station on Chapel drive. This new pump station is known as the Newton Creek Pump Station, and remains in service essentially unaltered from the original 1986 project. The 1986 project also included the construction of a new treatment plant south of the Marys River. New force mains from Pump Station A and the Newton Creek Pump Station were constructed to convey flows to the new treatment plant. The new treatment plant was designed as a summer-holding winter-discharge facility with a headworks, two facultative lagoons, and disinfection facilities. A new

single-port outfall into the Marys River was also constructed. In 2003 an expanded chlorine contact chamber was constructed and dechlorination facilities were added at the WWTP. With the exception of this work, the treatment plant operates largely as originally designed.

NEED FOR FACILITIES PLAN

The existing Sewerage System Facilities Plan was prepared by Westech Engineering and was adopted by the City in 1985. This document included a list of recommended improvements for the wastewater utility and helped enable the City to obtain an EPA construction grant for construction of improvements including the existing treatment lagoons. The 1985 plan was based on a 20 year planning horizon. Portions of the City's existing sanitary sewer facilities are nearing the end of their design life, and will need to be upgraded within the next planning period. The City of Philomath has chosen to address such problems in a proactive manner to avoid crisis situations. As such, the City believes a new facilities plan is necessary to identify guidelines for the development of the sanitary sewer system over the next planning horizon.

BASIS FOR FACILITIES PLANNING

As previously mentioned, some of the City's existing wastewater facilities are nearing the end of their design life. As such, improvements will be necessary. Though improvements are required, haphazard improvements that do not adequately consider all of the issues that impact the system may end up costing the City more in the long run than well thought-out, carefully-applied solutions. For example, if a particular sewer pipe can not convey the volume of wastewater that flows into it, a logical solution is to replace the pipe with a larger pipe. However, if the larger pipe is sized only to accommodate the existing flow volumes and future growth upstream of the pipe occurs, the pipe size may need to be increased a second time to accommodate the flow increases. Instead of replacing the pipe twice, a more cost-effective solution is to replace the pipe once with a pipe sized to accommodate the existing flows plus the anticipated future growth. As this example illustrates, most wastewater facilities cannot be expanded incrementally to accommodate growth. More often that not, the most cost effective solution is to initially size the facilities to accommodate anticipated growth within the planning period. Therefore, this Facilities Plan not only considers the existing deficiencies, but also considers what improvements are going to be required during the planning period as the City grows and develops. The intent of the recommendations proposed in the plan is to provide the City with reliable wastewater facilities that not only meet current demands, but that will also adequately serve the City well into the future.

The DEQ recommends a minimum 20-year planning period for facilities planning. This planning period begins once the construction of the required improvements is completed. The intent of this approach is to construct improvements that have minimum design life of 20-years. Based on the project schedule outlined in **Section 8**, the construction of the first phase of the recommended improvements should be completed during the 2007 calendar year. Based on a 20-year planning period, the recommended improvements are expected to serve the City's needs until 2027. In order to assess the City's needs in the year 2027, population growth projections must be made to determine future wastewater flows and loads. The DEQ mandates the use of

County coordinated growth rates and population projections. Therefore, the growth rates and population projections used in the Facilities Plan are based on figures adopted by Benton County for the City of Philomath. Using the County's adopted growth rate, the projected population of Philomath in the year 2027 is expected to be approximately 5259 (see **Section 2**). Projected wastewater flows and loads are based, in part, on this population. Wastewater flow and load projections are detailed in **Section 5**.

The DEQ mandates that the planning area for facilities planning be limited to the land within the present UGB of the City. Therefore, the improvements recommended in this plan are based on development of land within the UGB in its present location, as well as the existing land use zoning for these areas. It is assumed that no significant development will occur within the study area that will require major changes to the existing zoning, and that there will be no significant expansions of the UGB within the study period. Changes in any of these assumptions could change the recommendations contained in this facilities plan. Should significant changes in any of the above occur, the facilities plan should be updated accordingly.

COLLECTION SYSTEM DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

The collection system collects large amounts of infiltration and inflow. As previously stated, much of the collection system was constructed in 1952 and is nearing the end of its useful life. In addition to this, several sewer mains lack the capacity to convey existing peak flows. Pump Station A also lacks the capacity to convey peak flows. Surcharging in the Pump Station A collection basin is common. The primary purpose of the recommended collection system improvements is to reduce the amount of I/I and increase the capacity of the undersized facilities. The recommended improvements consist of implementing a large-scale, ongoing I/I reduction program, sewer main capacity increases, and replacing Pump Station A.

Funds generated from the I/I reduction program should be used to replace or rehabilitate the portions of the 1952 collection system that contribute the greatest amount of I/I. New sewers are typically constructed using PVC rather than concrete pipe. PVC pipe is more durable and leak resistant than concrete pipe. Modern construction techniques are also geared toward providing a relatively leak free system. Therefore, replacing those portions of the collection system that contribute the most I/I will reduce the amount of wastewater that must be treated at the WWTP.

Large portions of the collection system lack capacity to convey existing sanitary sewer flows. Therefore, the recommended improvements include upsizing the undersized trunk sewers. Pump Station A lacks capacity to convey existing peak flows and is nearing the end of its useful life and should be upgraded early in the planning period. The recommended improvements for the collection system are listed in **Table 6-4**.

TREATMENT AND DISPOSAL SYSTEM DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

The existing treatment facilities are in relatively good working order and have the capacity to treat and dispose of the existing flows and loads. The primary shortcoming associated with the

existing facilities is that they lack capacity to treat and dispose of the projected flows and loadings resulting from growth during the planning period. As such, treatment plant improvements are likely to be required as the City's population increases. The hydraulic storage and organic loading capacity of the lagoons must be increased to treat projected flows associated with growth. In addition, a disposal method other than discharge to the Marys River will likely be required. Several alternatives for addressing these deficiencies were identified and evaluated. These are explained in greater detail in **Section 7** of the Facilities plan. The evaluation presented in **Section 7** showed that the most cost-effective approach to increase the capacity of the treatment facilities is to construct a new Facultative Lagoon and new summer effluent reuse facilities. The recommended treatment and disposal system improvements are listed in **Table 7-10**. A schematic representation of the recommended improvements is provided in **Figure 7-1**.

COST PROJECTIONS

The project cost projections listed in the following table reflect costs in 2003 dollars and are planning level estimates intended to be in the range of +35% to –25% of the actual projects costs. The projected costs include legal, administration, permitting, engineering, and contingency as well as construction costs.

Recommended Improvements	
Project	Estimated Project Budget
I/I Reduction Program (Priority 1A)	$220,000/year
Pump Station A Replacement (Priority 1A)	$1,125,000
Priority 1A Trunk Sewer Improvements	$1,459,000
Priority 1B WWTP Improvements	$2,058,000
Priority 2 Trunk Sewer Improvements	$1,037,000
Priority 2 WWTP Improvements	$435,000
Timber Estates Pump Station Improvements (Priority 2)	$113,000
Newton Creek Pump Station Improvements (Priority 2)	$1,132,000
Total Estimated Project Budget (excluding annual I/I budget)	**$6,924,000**

This expenditure is expected to build the basic improvements needed to provide the capacity to meet existing and projected flows and loadings through the planning period (i.e., 2027).

FINANCING

Philomath does not currently have the resources nor is the City's existing user fee structure sufficient to fund the recommended improvements. Therefore, alternative funding sources must be pursued. Several potential funding sources are identified and discussed in **Section 8** of the Facilities Plan. All likely funding options will require the City to increase user rate and SDC's. We recommend that the City perform a user fee study and implement new user rates and SDC's as soon as possible.

IMPLEMENTATION PLAN

A three-phase implementation plan is recommended. This is discussed in greater detail in **Section 8** of the Facilities Plan. The first phase includes the development of a funding plan for the recommended improvements. This should include an evaluation of the current user rates and SDC fees. The rates and fees should be increased as required. The second and third phases include the implementation (i.e., construction) of the priority 1A and 1B improvements respectively. A fourth and final phase of the implementation plan also exists. This includes the construction of the priority 2 improvements. These improvements are heavily dependent upon growth and may or may not be required during the planning period. Nonetheless, the City should plan for these improvements to avoid future crisis situations. The City should periodically evaluate the demands placed on the utility to determine how actual growth compares to the projections presented herein. If growth occurs faster than anticipated, the priority 2 improvements may be needed sooner. Should growth occur slower than anticipated, the priority 2 improvements may be delayed. The following table lists milestones and recommended completion dates for the first three phases of the implementation plan.

Recommended Implementation Schedule (Priority 1A & 1B)	
Milestone	Date
PHASE I	
Submit Draft Facilities Plan to DEQ & City	8/30/03
Receive Comments from DEQ & City	1/31/04
Submit Final Facilities Plan to DEQ	7/31/04
DEQ Approval of Final Facilities Plan	8/31/04
City adopts Final Facilities Plan	9/30/04
Perform Rate Study & Implement New User Rates & SDCs	12/31/04
Update CIP	12/31/04
Conduct Funding Meeting With OECDD and RUS	2/15/05
Submit Funding Applications	5/31/05
Finalize Funding Package	12/31/05
PHASE II – Priority 1A Improvements	
Select Design Consultant	1/31/06
Complete Predesign Report	3/31/06
DEQ Approval of Predesign Report	4/30/06
Start Detailed Design of Improvements	5/31/06
Complete Design of Improvements	1/31/07
DEQ Approval of Plans & Specifications	3/15/07
Advertise for Construction Bids	4/15/07
Receive Construction Bids	5/15/07
Award Contracts	6/15/07
Start Construction	7/15/07
Complete Construction of Priority 1A improvements	12/31/07
PHASE III – Priority 1B Improvements	
Select Design Consultant, Prepare Predesign Report	1/31/09
Start Detailed Design of Improvements	6/1/09
Complete Design of Improvements	12/1/09
DEQ Approval of Plans & Specifications	2/1/10
Advertise for Construction Bids	4/1/10
Receive Construction Bids	5/1/10
Award Contracts	6/1/10
Start Construction	7/1/10
Complete Construction of Priority 1B improvements	11/1/10