

Nine Minimum Controls – No. 4

4.0 MAXIMIZATION OF FLOW TO THE POTW FOR TREATMENT

4.1 OVERVIEW

The 4th of the nine minimum controls is “Maximization of Flow to the POTW for Treatment”. The collection system aspects of flow maximization to the City’s POTW, the WPCP, are addressed in Chapter 2. Consequently, this Chapter addresses only those aspects of WPCP operations which allow for increased sewage treatment. More specifically, this chapter presents discussions of the WPCP’s capabilities, plans for WPCP improvements and strategies for operating the WPCP to both maximize the rate at which flow can be treated and best utilize the WPCP’s non-peak unused capacity.

4.2 WPCP CAPABILITIES

In 1994 the City completed a sewer system master plan. The performance of the WPCP as well as that of its individual processes were analyzed as part of that undertaking. In 1995 a stress test was performed to determine the capacity of the secondary system. These two studies led to the conclusions that sections of the WPCP were due for major repair or replacement and that the secondary system had more capacity than the primary system. The above studies also led to preparation of a facility plan for the WPCP in 1998.

The capacities of the WPCP, based on these three studies, are summarized in a description prepared by Donohue & Associates. This can be found at Exhibit D-1.

4.3 PLANNED WPCP IMPROVEMENTS

The 1998 facilities plan identified a number of potential improvements to the WPCP. An excerpt from this study can be found at Exhibit D-2. These improvements were suggested to increase the reliability and performance of the WPCP and increase the wet weather capacity of the individual unit processes to match the capacity of the existing secondary system.

The actual construction of these improvements has been divided into 3 phases. The first phase focused on screening and pumping facilities. An excerpt from the Preliminary Engineering Report for this phase can be found in Exhibit D-3. The goal of second phase will be to address the primary system and transportation of the sewage from the primary system to the secondary system. An excerpt from the Preliminary Engineering Report for this phase can be found at Exhibit D-4. The final phase is intended to address the problem of discharging effluent during high river stage. The projects for this phase are also discussed in the Preliminary Engineering Report found at Exhibit D-4.

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All of the new structures are being sized to increase the WPCP's overall wet weather capacity to that of the secondary system. However, some of the equipment required to increase the WPCP's capacity is not being installed until all the processes can handle the increased flow. This means that there will not be any substantial increase in the WPCP's wet weather treatment rate until the completion of the final phase.

The first phase was completed in early 2005. The second phase is expected to be completed in 2008. The final phase is scheduled to begin in 2014.

In addition to the above-described WPCP improvements, the City intends (as part of its LTCP) to implement improvements with respect to its CSO Ponds to provide for dewatering from the CSO Ponds to the WPCP during dry weather. The dewatering facilities are to be constructed in two phases. The first phase is scheduled to be completed during 2008 to allow immediate dewatering capabilities on a limited scale. Higher capacity dewatering improvements will be implemented later during the LTCP implementation period.

4.4 OPERATION OF THE WPCP

Currently, all WPCP components are used during wet weather operations. There are no unused tanks or process equipment. Once all phases of WPCP improvements are completed, a higher rate of treatment during wet weather will be possible. .

Chapter 2 identified several ways to store peak flows and release the stored flows as the WPCP has capacity. Therefore, the best way to increase flow through the WPCP is to utilize its non-peak unused capacity. This can be accomplished by treating all dry weather flow as it arrives at the WPCP, increasing treatment rates as flow rates to the WPCP increase, and run the WPCP at its maximum capacity until all stored flow is treated.

4.5 RECORDKEEPING

The projects listed in Exhibit D-2 should be considered part of the CSO LTCP not a minimum control because of their size and complexity. Progress on these projects will be included in LTCP progress reports.

WPCP records will be analyzed after each wet weather event to see that the WPCP works at capacity intended until all stored flows are treated.

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DIRECTORY FOR APPENDIX D (Items Presented in Order of Appearance in Appendix D)

<u>Item</u>	<u>Description</u>
Exhibit D-1	UNIT PROCESS DEPICTION OF WPCP CAPACITY
Exhibit D-2	FACILITIES PLANNING STUDY – MAY 1998
Exhibit D-3	PRELIMINARY ENGINEERING REPORT – JANUARY 2001
Exhibit D-4	PRELIMINARY ENGINEERING REPORT – JUNE 2003

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EXHIBIT D-1



**City of Fort Wayne, Indiana
Unit Process Depiction of WPCP Capacity**

The Water Pollution Control Plant (WPCP) of the City of Fort Wayne comprises the following three basic process units, characterized by the indicated hydraulic/treatment capacities (unless otherwise noted, capacities are based on all units/basins in service):

Preliminary Treatment

Firm hydraulic capacity (less 1 pump)	60 mgd
Total hydraulic capacity (all pumps)	72 mgd
Grit removal performance deteriorates at	40 mgd ¹

Primary Treatment

Maximum treatment capacity	60 mgd ²
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Secondary Treatment, Disinfection, and Polishing

Maximum treatment capacity	60 mgd ³
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Comments:

¹ As reported by plant staff

² From preliminary treatment, flow is pumped to the primary clarifiers for primary treatment. At high flows (about 60 mgd), the weirs of the primary clarifiers are flooded and water enters the rotating scum pipes while they are in the "closed" position. Also, with flows of 70 mgd, the primary mechanism flights in the tanks are completely submerged. At these conditions, the primary clarifiers perform poorly. Operating records show that the removal efficiencies for TSS and BOD are 32% and 19%, respectively. The primary clarifiers should be able to achieve removal efficiencies for TSS and BOD up to 75% and 40%, respectively. The excess water that enters the scum pipes drain to the primary sludge wet well which is pumped to the digesters. The additional water from the scum pipes dilutes the sludge which reduces digestion performance and is energy intensive.

³ After primary treatment, the wastewater enters the secondary treatment or activated sludge process. In 1996, a process stress test was performed to determine capacity of the secondary system. With all units in service, the secondary system could treat up to 85 mgd. However, to reach this capacity, design and construction of new preliminary treatment, primary treatment and some secondary facilities are needed to be able to transport 85 mgd through the secondary process. In October 2002, additional hydraulic testing was performed on the existing secondary system from the primary effluent channels through the secondary clarifiers. The testing showed the hydraulic capacity of the existing facilities is about 60 mgd. At this flow rate, the primary clarifier weirs will begin to flood. Finally, the plant is not able to discharge water from the plant at high river levels.

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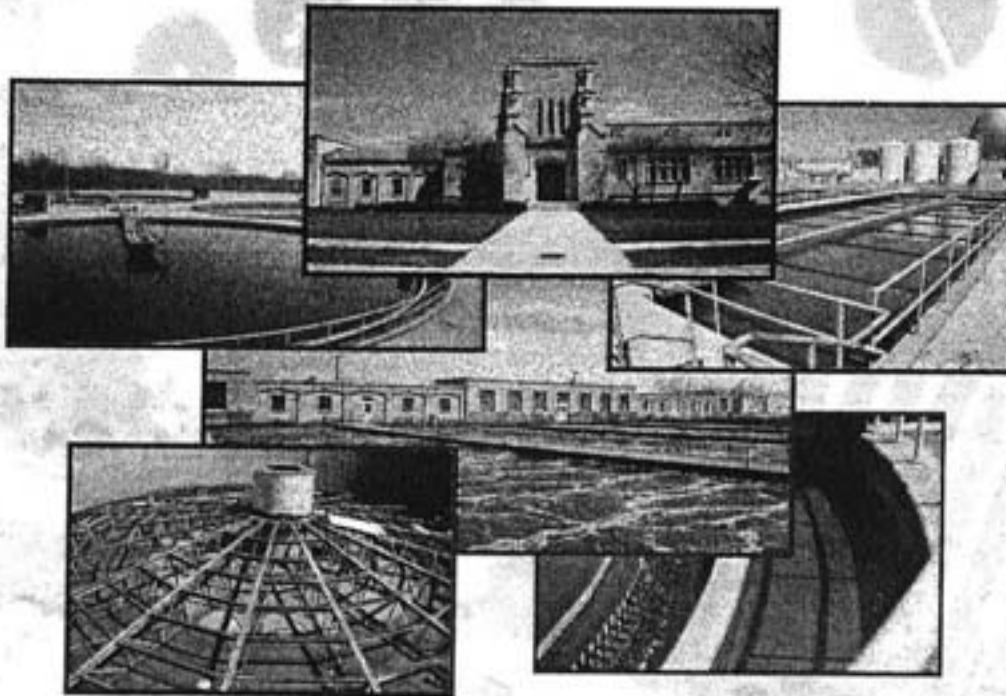
EXHIBIT D-2

May 1998

City of Fort Wayne Water Pollution Control Plant Facilities Planning Study Volume 1 of 2 REPORT



The City of Fort Wayne
City Utilities



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Fax: 920-208-0402



in association with
Greeley and Hansen
Environmental Management Consulting
EMA, Services, Inc.

A breakdown of the initial costs is presented in the following table. The estimates include the total cost of construction with contingencies and engineering. The initial cost has been indexed to an Engineering News Record (ENR) Construction Cost Index of 5900. (Note: The ENR Construction Cost Index stood at 5882.73 in April 1998.)

Initial Cost Estimate of Recommended Plan

Description	Plan A Pond 3 Used For Effluent Polishing (\$ million)	Plan B Pond 3 Used For CSO Storage (\$ million)
Preliminary Treatment Facilities		
Headworks and Screening	6.01	6.01
Raw Wastewater Pumping	5.96	5.96
Grit Removal	2.78	2.78
<u>Septage Receiving</u>	<u>0.79</u>	<u>0.79</u>
Subtotal	15.54	15.54
Primary Treatment Facilities		
Circular Primary Clarifiers	17.37	17.37
<u>Primary Sludge Pumps</u>	<u>0.86</u>	<u>0.86</u>
Subtotal	18.23	18.23
Secondary Treatment Improvements		
Clarifier Feed Channel Hydraulics	1.12	1.12
Clarifier Mechanism Rehabilitation	2.92	2.92
Clarifier Feed Channel Scum	0.14	0.14
West RAS Pumps (Clarifiers No. 1 - 6)	1.09	1.09
<u>East RAS Pumps (Clarifiers No. 6 - 9)</u>	<u>0.44</u>	<u>0.44</u>
Subtotal	5.71	5.71
Filtration	0	24.60
Disinfection: Hypochlorite and Bisulfite	1.65	0
Disinfection: Ultraviolet Light	0	5.32
Effluent Pump Station	1.92	1.92
WAS Handling Improvements	0.41	0.41
Anaerobic Digestion Improvements	3.39	3.39
Non-Process Facilities	5.57	5.57
Site Power Distribution	1.79	1.79
Flood Control	0.99	0.99
Plantwide I&C (EMA – April 1998)	1.92	1.92
TOTAL	57.12	85.39
<i>ENR Construction Cost Index = 5900</i>		

TABLE 1 Plan A - Pond 3 Used For Effluent Polishing Construction Packaging and Annual Expenditure Plan

Package Description	Total (\$ million)	1998 (\$ million)	1999 (\$ million)	2000 (\$ million)	2001 (\$ million)	2002 (\$ million)	2003 (\$ million)	2004 (\$ million)	2005 (\$ million)
Package 1									
Secondary Treatment: Feed Channel, East RAS, East Mech Rehab	3.00		3.00						
W/AS Handling Improvements	0.41		0.41						
Disinfection: Bisulfite Facilities	0.45		0.45						
Package 2									
Preliminary Treatment Facilities	15.54		1.01	7.26	7.26				
Primary Treatment: 6 Clarifiers	13.74		1.19	6.28	6.28				
Site Power Distribution	1.79		0.12	1.68					
Flood Control	0.99		0.06	0.92					
Package 3									
Non-Process Facilities	5.57			0.36	3.90	1.30			
Package 4									
Anaerobic Digestion Improvements	3.39			0.22	3.17				
Package 5									
Hypochlorite	1.20				0.08	1.12			
Effluent Pump Station	1.92				0.13	1.79			
Package 6									
Secondary Treatment: West RAS, West Mech Rehab	2.72							2.72	
Package 7									
Primary Treatment: 2 Clarifiers	4.49								4.49
Planwide I&C (EMA April, 1998)	1.92	0.50	0.63	0.46	0.18	0.16			
Total	57.12	0.50	6.87	16.60	14.30	7.44	4.22	2.72	4.49

Costs Indexed to Engineering News Record (ENR) Construction Cost Index = 5900

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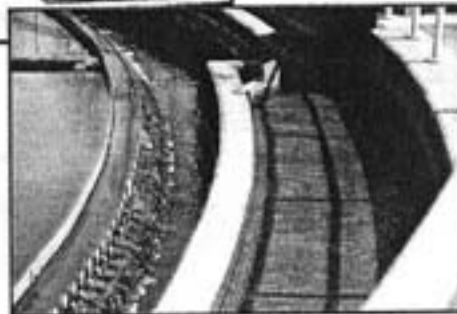
EXHIBIT D-3

January 2001

**City of Fort Wayne
Water Pollution Control Plant
Preliminary Engineering Report
Phase II Package No. 1
PRELIMINARY AND SECONDARY
TREATMENT IMPROVEMENTS**



The City of Fort Wayne
City Utilities



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Sheboygan, WI 53081
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Project No. 10206



PREFACE PROJECT SUMMARY

Introduction

This Preliminary Engineering Report (PER) is being prepared for review and approval by the Indiana Department of Environmental Management (IDEM) as part of the City of Fort Wayne's year 2000 request for State Revolving Loan Funds (SRF). This PER is intended to summarize portions of the work included in the previously completed "Facilities Planning Study" prepared for the City of Fort Wayne Water Pollution Control Plant, dated May 1998. That study addressed the Water Pollution Control Plant modifications needed for improved operations, additional capacity of certain process units, and included facilities needed for conformance with the Long Term Control Plan (LTCP) being prepared by the City. This PER is also intended to address additional issues, which were not discussed in the earlier study but are required for SRF participation in the construction of the facilities.

Project Purpose and Overview

This project is the first package of seven to expand and upgrade the plant to 85 mgd. Package No.1 is the construction of the preliminary treatment facilities for equipment that will handle 60 mgd presently and a structure that will provide space for future equipment to handle a peak flow of 85 mgd. The purpose of the proposed project is to rehabilitate or replace deteriorated facilities, meet the state and federal CSO Policy minimum control and long-term control plan requirements to maximize flow of wastewater at the wastewater treatment plant, and to meet future wastewater needs in the future area through the planning period to the year 2015. In addition to preliminary treatment improvements, this package includes rehabilitation of east secondary clarifiers and return sludge pumping facilities, septage receiving, upgrades to the electrical system, and flood control improvements.

The existing treatment plant was designed for a flow of 60 mgd. A stress test was conducted in 1995 that indicated that the secondary treatment facilities are capable of treating 85 mgd. This project is to design and construct preliminary treatment facilities (grit removal, screening, and influent pumping) and associated improvements so that 60 mgd of wastewater can reliably be delivered into the plant. In addition the preliminary treatment facilities will be structurally sized so that additional equipment can be installed in the future that will increase the peak flow to 85 MGD to match the capacity of the secondary facilities. Therefore this project will not increase the capacity of the existing plant at this time.

The overall plan to expand the treatment plant capacity to handle a peak flow of 85 mgd will be designed and constructed over a 13-year period. The plan includes design and construction of the facilities as described in 7 packages as shown below. **This project and PER is only for Package No. 1.**

Package 1 Preliminary and Secondary Treatment Improvements Phase I

- Raw Wastewater Screening Facilities
- Raw Wastewater Pumping Facilities
- Grit Removal Facilities
- Septage Receiving Facilities
- Site Power Distribution (preliminary and primary only)
- Flood Control
- Secondary Treatment Improvements:
 - Clarifier Effluent Flow Metering
 - Stamford Baffles (1 clarifier only for testing)
 - Clarifier Feed Channel Capacity Improvements

WAS Handling Improvements
East Clarifier Mechanism Rehabilitation
East RAS Pumps (Clarifiers No. 6 - 9)

Package 1 is scheduled for design, bid and award followed by a 2-year construction period. This is a large package that includes new wastewater screens, pumps and grit removal equipment (preliminary treatment facilities). New preliminary treatment facilities are desperately needed to remove debris from the wastewater. Since this project includes construction on the prior disturbed vacant land west of the existing main plant, this package includes the new flood control levee and the new site power distribution system. Package 1 includes improvements to increase the hydraulic capacity for all of the secondary clarifiers. This package includes rehabilitation of the mechanisms for the east clarifiers, the oldest of the secondary clarifiers, and replacement of the east clarifier RAS pump drives.

Future Design and Construction Packages are as follows:

Package 2 Digestion Improvements Phase I

Cover Replacement for Digesters 5 and 6
Installation of Mixers for Digesters 5 and 6

This package provides replacement of the digester covers for tanks 5 & 6. The mixers were purchased as a part of a previous contract but could not be installed on the existing old covers due to structural deterioration.

Package 3 Primary Treatment Improvements Phase I

4 of 8 Primary Clarifiers
6 of 12 Primary Sludge Pumps

Package 4 replaces the existing primary clarifiers with 4 new primary clarifiers that will handle up to 60 mgd.

Package 4 Disinfection and Effluent Pump Station

Sodium Hypochlorite and Bisulfite Facilities
Effluent Pump Station

Replacement of the existing gaseous chlorine system, including shipment by railcar and storage in 55-ton tanks, will be accomplished in Package 4 by the addition of new sodium hypochlorite storage and feed facilities. Sodium bisulfite facilities will be added at pond No.3 for dechlorination of the effluent. The new effluent pump station for pumping secondary effluent is also included in this package.

Package 5 Non-Process Facilities

Non-Process Facilities

Construction of the non-process facilities in Package 5 includes new administration and personnel areas in the Main Control Building and a new vehicle storage garage. Construction of this package is scheduled to begin as soon as startup and operation of the new primary treatment facilities provided in Package allow the existing preliminary treatment facilities located in the basement of the Main Control Building to be abandoned or demolished.

Package 6 Preliminary, Primary, Secondary and Digestion Improvements Phase II

- 4th of 4 Raw Wastewater Screens
- 6th of 6 Raw Wastewater Pumps
- 5th and 6th of 8 Primary Clarifiers
- 4 of 6 Remaining Primary Sludge Pumps
- Secondary Treatment Improvements:
 - West Clarifier Mechanism Rehabilitation
 - West RAS Pumps (Clarifiers No. 1 - 5)
 - Stamford Baffles (8 remaining clarifiers)
 - Clarifier Scum Channel Improvements
- 4th of 4 Effluent Pumps
- Heat Exchangers for Digesters 5 and 6

Package 6 provides preliminary, primary treatment and effluent pumping for the plant to handle a peak flow of 85 mgd. The heat exchangers for digester 5 and 6 are added to allow the digesters to operate as high rate primary tanks.

This package includes rehabilitation of the mechanisms for the west secondary clarifiers. Replacement of the existing airlift RAS pumps for the west secondary clarifiers with new submersible RAS pumps. Stamford baffles would be installed in the remaining 8 clarifiers to handle the higher flow and the secondary clarifier scum channels would be automated for unmanned operation.

Package 7

- Primary Treatment: 2 Clarifiers
- Primary Sludge Pumps: 2 Remaining

The 2 remaining primary clarifiers, with associated sludge pumping equipment, are included in Package 7. These clarifiers do not need to be constructed until wastewater BOD₅ and suspended solids increase to the point that the activated sludge process cannot consistently nitrify the waste.

Plantwide I&C

The plantwide instrumentation and control work will be performed concurrent with other construction packages.

Construction Cost Estimate

The initial cost for the recommended plan for Package No. 1 is \$ 22.63 million

A breakdown of the construction costs is presented in the following table. The estimates include the total cost of construction with contingencies. The construction cost has been indexed to an Engineering News Record (ENR) Construction Cost Index of 6266. (Note: The ENR Construction Cost Index stood at 6265.63 in November 2000.)

Construction Cost Estimate of Recommended Plan

Description	Package 1 (\$ million)
<hr/>	
Preliminary Treatment Facilities	
Headworks and Screening	5.03
Raw Wastewater Pumping	5.16
Grit Removal	2.57
Septage Receiving	0.73
84" Sewage Conduit	0.74
<u>Piping Tunnel</u>	<u>1.47</u>
Subtotal	15.70
Secondary Treatment Improvements	
Clarifier Feed Channel Hydraulics	0.02
East Clarifiers Mechanism Rehabilitation	1.20
Clarifier Effluent Metering	0.07
Stamford Baffles (1 Clarifier)	0.10
East RAS Pumps (Clarifiers No. 6 - 9)	0.41
<u>WAS Handling Improvements</u>	<u>0.38</u>
Subtotal	2.18
Site Power Distribution	1.31
Flood Control	0.91
Site Work & Yard Piping	0.05
<u>Plantwide I&C</u>	<u>0.43</u>
Subtotal	20.58
<u>Contingency 10%</u>	<u>2.05</u>
TOTAL	22.63

ENR Construction Cost Index = 6266

SELECTED PLAN COST SUMMARY

Item	Total Cost
Non-Construction Costs	
Administrative and Legal.....	\$ <u>200,000</u>
Land & Rights-of-way Acquisition.....	\$ <u>-</u>
Relocation	\$ <u>-</u>
Engineering Fees	
Design	\$ <u>1,200,000</u>
Construction.....	\$ <u>250,000</u>
Other	\$ <u>500,000</u>
Project Inspection.....	\$ <u>1,500,000</u>
Costs Related to Plant Start-up	\$ <u>520,000</u>
<u>Non-Construction Subtotal</u>	<u>\$ 4,170,000</u>
Construction and Equipment Subtotal.....	\$ <u>20,580,000</u>
Contingencies	\$ <u>2,050,000</u>
TOTAL PROJECT COST	\$ <u>26,800,000</u>

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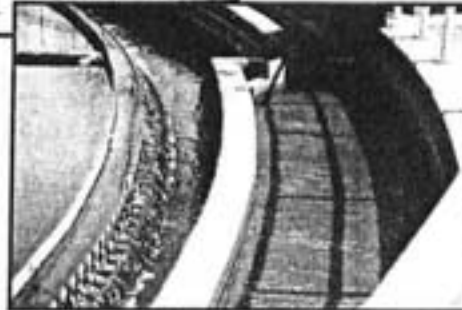
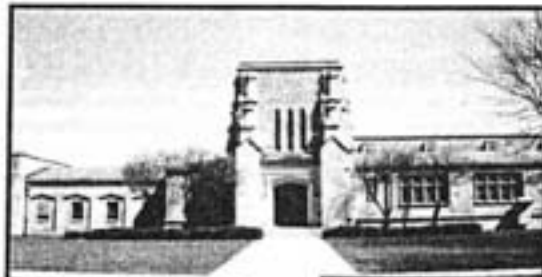
EXHIBIT D-4

June 2003

**City of Fort Wayne
Water Pollution Control Plant
Preliminary Engineering Report
Primary Clarifiers and Other Plant
Upgrades**



The City of Fort Wayne
City Utilities



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Project No. 10528



PREFACE PROJECT SUMMARY

Introduction

This Preliminary Engineering Report (PER) is being prepared for review and approval by the Indiana Department of Environmental Management (IDEM) as part of the City of Fort Wayne's year 2002 request for State Revolving Loan Funds (SRF). This PER is intended to summarize portions of the work included in the previously completed "Facilities Planning Study" prepared for the City of Fort Wayne Water Pollution Control Plant, dated May 1998. That study addressed the Water Pollution Control Plant modifications needed for improved operations, additional capacity of certain process units, and included facilities needed for conformance with the Long Term Control Plan (LTCP) prepared by the City and submitted to IDEM for approval. This PER is also intended to address additional issues, which were not discussed in the earlier study but are required for SRF participation in the construction of the facilities.

Project Purpose and Overview

The "Facilities Planning Study" outlined a build-out plan of seven packages to expand and upgrade the plant from 60 mgd to 85 mgd. WPCP Improvements Package No.1 Preliminary and Secondary Treatment Facilities is under construction. Package No. 1 includes improvements to the preliminary and secondary treatment facilities. The preliminary treatment facilities improvements will handle 60 mgd presently and provide space for future equipment to handle a peak flow of 85 mgd. Secondary improvements are being made to the east plant secondary clarifiers, east return activated sludge (RAS) pumps, and the RAS and WAS metering and piping system for the entire plant.

The City has decided to change the sequence of the build-out plan to meet replacement needs of the primary treatment process due to structural deterioration and poor performance. The next project is a combination of construction packages as discussed in the "Preliminary Engineering Report, Phase II Package No. 1 Preliminary and Secondary Treatment Improvements", June 2001. The project includes: new primary clarifiers, a third fine pore bar screen, new chemical phosphorus removal facilities, new disinfection (sodium hypochlorite and sodium bisulfite), new west plant RAS pumps, secondary clarifier scum channel improvements, Stamford Baffles for eight secondary clarifiers, basin drain pumping facilities, a new south primary effluent conduit, a new outfall and site improvements. The purpose of the proposed project is to rehabilitate or replace deteriorated facilities, to meet the state and federal CSO Policy minimum control and long-term control plan requirements for maximizing flow of wastewater at the wastewater treatment plant, and to meet future wastewater needs through the planning period to the year 2025.

The existing treatment plant was designed for a flow of 60 mgd. A stress test was conducted in 1995 that indicated that the secondary treatment facilities are capable of treating 85 mgd. This project is to design and construct primary treatment facilities and make other facility improvements so that 60 mgd of wastewater can reliably be treated at the plant. The primary treatment facilities will be designed to accommodate a future peak flow of 85 MGD to match the capacity of the secondary facilities. This project will not increase the capacity of the existing plant at this time.

The overall plan to expand the treatment plant capacity to handle a peak flow of 85 mgd will be designed and constructed as required by the long-term control plan. The facilities to be constructed in the future include the following:

Cover Replacement for Anaerobic Digesters 5 and 6
Installation of Mixers for Digesters 5 and 6
Heat Exchangers for Digesters 5 and 6
Effluent Pumping Station
Non-Process Facilities
Raw Wastewater Pumps 5 and 6
Septage Receiving Facilities

Plant wide instrumentation and control work will be designed and implemented concurrent with the construction of facilities.

Construction Cost Estimate

The initial cost for the recommended plan for the Primary Clarifier and Other Upgrades Project is \$ 29.83 million. A breakdown of the construction costs is presented in the following table. The estimates include the total cost of construction with contingencies. The estimate is based on the April 1998 Facilities Plan Costs. The construction cost has been indexed to an Engineering News Record (ENR) Construction Cost Index of 6502 plus 6% for bidding in 2004. (Note: The ENR Construction Cost Index stood at 6502 in March 2002.)

These costs are different then the costs shown in Chapter 4 because these costs are installed costs with the common elements of the system included. The costs in Chapter 4 are for the non-common items and are for comparison purposes. Also the costs in Chapter 4 do not include indexing for the construction period unless it is noted.

To support the following construction cost estimate; supplemental breakdown information is provided at the end of this chapter. The construction cost estimates include the installed cost with the Indexing.

<i>Construction Cost Estimate of Recommended Plan</i>	
Description	Primary Project Dollars
Preliminary Treatment Facilities	
Fine Screen	703,237
Primary Treatment Facilities	
New Primary Clarifier Facilities	17,564,990
Phosphorus Removal Facilities	522,619
Primary Effluent Conveyance Improvements	
New South 84"PE to Aeration Basins	1,671,245
New South 36" PE to West Plant Aeration Basins	833,023
Improvements to Existing 60"PE to Aeration Basins	275,795
Secondary Treatment Facilities	
West RAS Pumping Facilities	919,796
Secondary Clarifier Improvements	659,208
Disinfection Facilities	1,536,829
Other Site Improvements	
Remove Existing Screening, Grit, and Pumping Facilities	220,000
Demolish Existing Primary Clarifiers & Prep Site	1,260,000
Outfall Sewer	140,000
North Access Road Improvements	100,000
Basin Drain Facilities	311,453
Site Power Distribution	400,000
Subtotal	27,118,182
Contingency 10%	2,711,818
TOTAL	29,830,014

ENR Construction Cost Index = 6502 plus 6% for 2004 bidding

Selected Plan Cost Summary

The selected plan cost summary includes the Non-Construction Costs, Construction Cost and Contingency. The Administrative and Legal cost are estimated for the City to pay for legal council as a part of this project. The Design fee is for the design firm (Donohue) to design the selected plan Primary Clarifiers and Other Upgrades. Construction fee is for the design firm (Donohue) to provide services during construction such as shop drawing review, engineer site visits, response to contractor and Project Manager questions and record drawings. Other fees are for the Project Manager to provide Resident Engineering and Construction Contract Management Services. The Project Inspection fees are for the Project Manager to provide full time on-site inspection during construction. Other Related Costs to Plant Start-up fees are for the designer (Donohue) to provide programming of the automation, write the O & M manual, train the staff in the operation of the facilities, develop and deliver standard operating procedures, and assist with start-up and fine tuning of the facilities.

Item	Total Cost
Non-Construction Costs	
Administrative and Legal.....	\$ <u>200,000</u>
Land & Rights-of-way Acquisition	\$ <u>-</u>
Relocation.....	\$ <u>-</u>
Engineering Fees	
Design.....	\$ <u>1,800,000</u>
Construction.....	\$ <u>600,000</u>
Other	\$ <u>500,000</u>
Project Inspection	\$ <u>1,500,000</u>
Costs Related to Plant Start-up	\$ <u>569,986</u>
<u>Non-Construction Subtotal.....</u>	<u>\$ 5,169,986</u>
Construction and Equipment Subtotal.....	\$ <u>27,118,194</u>
Contingencies.....	\$ <u>2,711,820</u>
TOTAL PROJECT COST	\$ <u>35,000,000</u>