CITY OF PORTLAND
COMBINED SEWER OVERFLOW PROGRAM

ANNUAL CSO PROGRESS REPORT TO DEQ

FISCAL YEAR 2002-2003

As Required by the Amended Stipulated Final Order
(ASFO WQ-NWR-91-75)

CITY OF PORTLAND
BUREAU OF ENVIRONMENTAL SERVICES

JUNE 30, 2003

Annual CSO Progress Report to DEQ for FY 2002-2003

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ANNUAL CSO PROGRESS REPORT TO DEQ FOR FY 2002-2003

I. Summary

Portland's Combined Sewer Overflow (CSO) Program has completed the 12th year of implementing the full array of projects that will fulfill Portland's commitment to control all CSO discharges by December 2011. The City has completed all CSO projects for the Columbia Slough system, including recent improvements to ensure compliance with the ASFO. In the Willamette System, Portland is fully engaged in constructing large drop shafts, tunnels, and a large pump station as part of the Westside Willamette River CSO Program. This large facility construction is occurring while the City is also constructing and designing stream separation projects and local basin improvements, all designed to control CSO and manage combined sewage flows within the system.

The Annual CSO Progress Report, required under the Amended Stipulated and Final Order (ASFO), presents the activities completed during fiscal year that ends June 30. The highlights and note-worthy accomplishments from fiscal year 2002-2003 include:

- Completed improvements based on new design storms in North Portland to ensure outfalls #54, #55, and #56 meet and exceed the 5-year winter, 10-year summer storm levels of control.
- Submitted ASFO Compliance Report for Controlled CSO Outfalls as required by the ASFO, which provides information demonstrating the 13 Columbia Slough and 7 Willamette River outfalls controlled by December 2001 comply with the ASFO required levels of control.
- Met the May 1, 2003 ASFO milestone for initiating construction for controlling 16 Willamette River outfalls for the December 2006 deadline.
- Completed excavation and initial lining of the Nicolai shaft where the West Side CSO tunneling process will begin.
- Completed slurry walls and began deep excavations of the shafts for the West Side CSO Tunnel and the large Swan Island Pump Station.
- Completed construction of Segment 1 of the Southwest Parallel Interceptor.
- Completed construction of Tanner Creek Phase 2 Tunnel for stream diversion.
- Began Preliminary Design for the East Side Willamette River CSO Tunnel.

The City of Portland has completed each of the 19 milestones required in the ASFO that have come due since August 1995 through June 30, 2003. Portland's CSO Program is on schedule and moving aggressively through the next phase of controlling the Willamette River CSO outfalls. This year, due to the massive facility construction program we have undertaken, we will expend approximately $90 Million in CIP funds constructing the required CSO facilities.

The significant activities we expect to complete next fiscal year ending June 30, 2004 include:

- Complete the sizing and systems operations plan for the East Side Willamette River CSO Tunnel and the overall 2011-combined system.

- Construct the West Side CSO tunnel machines and initiate tunneling in both the northeast and southern directions from the Nicolai shaft.
- Complete excavation, and lining on the remaining large drop shafts at Upshur, Ankeny, Clay and the Confluent Structure for the West Side CSO System.
- Continue design and construction of Tanner Creek Stream Diversion Phases 3, and 4
- Complete California CSO Separation for CSO Outfall OF#01.
- Install HYDRA (Hydrologic Data Retrieval and Alarms System) SLRTs (Sewer Level Remote Telemetry) on 15 new diversion structures to provide CSO and DWO alarms. These are in addition to the 11 installed this fiscal year.

II. Introduction

Requirement for Annual Progress Report

This annual report to the Oregon Department of Environmental Quality (DEQ) is required under the Amended Stipulation and Final Order (ASFO) No. WQ-NWR-91-75 signed with the City of Portland (City) on August 11, 1994. During the period that the ASFO is in effect, the City is required to submit (each year by September 1st) an annual progress report summarizing the City's efforts to eliminate CSO discharges. The report is to contain information on CSO control activities performed during the past fiscal year and identify the CSO Program work planned for the current fiscal year. This report covers the CSO Program activities performed under the Capital Improvement Program (CIP) as well as the planning, operation and maintenance activities performed by the Bureau of Environmental Services (BES) operating programs for the recently completed fiscal year.

Portland's Capital Improvement Program (CIP)

The City of Portland's Bureau of Environmental Services manages the planning, and implementation (pre-design, design, construction, & startup) of all capital projects. The CIP is divided into specific functional categories which include: CSO, Maintenance and Reliability, Sewage Treatment Systems, Surface Water Management, and Systems Development. The number of capital improvement projects, listed by program area, is shown in Table 1 below.

Table 1 : Projects in Current Capital Improvement Program

Category	Projects Listed at End of FY 02-03	Projects Open During FY 02-03
Combined Sewer Overflow	273	23
Maintenance and Reliability	400	7
Mid-County Sewer	86	0
Sewage Treatment Systems	333	20
Surface Water Management	134	11
Systems Development	210	6
Total	**1,436**	**67**

At the end of fiscal year 2002-2003, there were 1,436 individual projects listed in the CIP and 67 projects open during the year. For the CSO Program, there were 273 CSO projects listed in the CIP (see Appendix A for the CSO Capital Improvement Program Implementation Schedule). The 273 CSO projects represent the CSO Management Plan, as it currently exists within the City of Portland in terms of CIP activities. This report focuses primarily on the accomplishments of those projects. It should be noted, however, that there are projects in other CIP categories that have or will have a positive impact on water quality and the control and/or handling of CSO such as basement flooding control projects and improvements at Columbia Boulevard Wastewater Treatment Plant (CBWTP). These projects are not extensively covered in this report but represent other work BES performs that results in improved control of CSO discharges.

III. CSO Program Background

In 1991, when the Stipulation and Final Order (SFO) was issued by DEQ, approximately 60% of Portland's population was served by the combined sewer system. When a storm event occurred in the City that exceeded 0.10 inches in a few hours, stormwater runoff into the combined system would cause overflows to both the Columbia Slough and the Willamette River through up to 55 individual outfalls. Model simulations showed that the 1990 combined sewer system would discharge approximately 6.0 billion gallons of CSO to the Columbia Slough and Willamette River for an average year. CSO discharges are estimated to contain approximately 20% untreated municipal wastewater and 80% stormwater.

Since 1991, the City has implemented stormwater reduction facilities across the city (these are referred to as the “Cornerstone Projects”), improved interceptor system performance, and completed large CSO conveyance, storage and treatment facilities in the Columbia Slough system. These activities have resulted in CSO discharges being reduced by more than half

citywide. In the Columbia Slough, CSO events have been eliminated for storms less than 5-year winter or 10-year summer return frequency. CSO discharge volumes to the Willamette River have been reduced from 4.8 billion gallons per year (1990 estimate) to 2.76 billion gallons per year, based on average annual rainfall.

In 1994, the SFO was amended to allow a more cost-effective approach for obtaining appropriate water quality benefits for the Willamette River. The new agreement, the Amended Stipulated Final Order (ASFO), retained a similar schedule such that the CSO controls would be implemented across a 20-year period from 1991 through 2011. The City has met or exceeded each of the regulatory requirements for CSO control identified in the ASFO. The ASFO contains the following major milestones for controlling the CSO outfalls:

- By December 1, 2000, the City must eliminate all CSO discharges to the Columbia Slough for storms equal to or less than the 5-year winter storm and 10-year summer intensities. [Milestone completed.]
- By December 1, 2001, the City must eliminate CSO discharges at 7 Willamette River outfalls for storms less than or equal to a 3-year summer storm and limit winter overflows to four or less per winter on average. [Milestone completed.]
- By December 1, 2006, the City must eliminate CSO discharges at 16 additional Willamette River CSO outfalls for storms less than or equal to a 3-year summer storm and limit winter overflows four or less per winter on average. [Construction in progress.]
- By December 1, 2011, the City must eliminate CSO discharges at all remaining Willamette River outfalls for storms less than or equal to a 3-year summer storm and limit winter overflows to less than four per winter on average. [Design in progress.]

The ASFO has a number of intermediate milestones, including submission of this annual CSO progress report to DEQ by September 1 of each year that the ASFO is in effect.

IV. Past Fiscal Year Activities

The CSO abatement activities performed during the period beginning July 1, 2002 and ending June 30, 2003 are categorized in five subsections:

- ASFO Milestones Achieved
- Program Planning Accomplished
- CSO Control Projects Planned, Designed, and/or Constructed
- CSO Operation and Maintenance Activities
- Public Involvement Activities

A. ASFO Milestones Achieved

This past fiscal year contained four ASFO milestones as part of required steps for completing Portland's 20-year CSO program. In total, there are 38 milestones beginning with the first CSO Progress Report required in 1995 all the way through the final report in 2012 that will demonstrate the completed system's compliance with the ASFO performance criteria. The FY 02-03 milestones included #16 through #19. The milestones and the relevant ASFO section requiring the task are as follows:

- Milestone #16 – Annual CSO Progress Report for FY01-02 as per ASFO Section 12.a (11): "By no later than September 1 of each year that this Amended Order is in effect, the City shall submit to the Department and to the Commission for review an annual progress report on efforts to eliminate untreated CSO discharges, subject to the storm return frequencies specified in Paragraph 12.a. of this Amended Order."

- Milestone #17 – Submit Report Demonstrating Compliance of Controlled Columbia Slough CSO Outfalls - ASFO Section 12.d: "Requiring Respondent to demonstrate that each untreated CSO discharge has been eliminated, subject to the storm return frequencies specified in Paragraph 12.a. of this Amended Order, by a means approved by the Department, within twelve months of the scheduled date when compliance is required in this Amended Order. "

- Milestone #18 – Submit Report Demonstrating Compliance of First 7 Controlled Willamette River CSO Outfalls - ASFO Section 12.d.

- Milestone #19 – Begin Construction for Next 16 Willamette River CSO Outfalls - ASFO Section 12.a (6): "By no later than May 1, 2003, the Respondent [City] shall begin construction required to comply with Section 12.a. (7)."

B. Accomplishments in Program Planning

The CSO Program continues to develop and execute planning projects for facilities and activities that will cost-effectively control CSO and assure that the Program meets our regulatory obligations. Planning activities performed during Fiscal Year 02-03 include the following:

Portland's Clean River Planning Efforts

The Clean River Plan is a strategic approach to address multiple regulatory requirements and provide framework to integrate the activities of Environmental Services including: CSO control, watershed restoration, stormwater management, operations and maintenance, stewardship, coordination, and flood protection.

- Watershed Planning Efforts: The BES Planning Group is developing five comprehensive watershed plans that will further refine the Clean River Plan. BES staff and team members are developing Watershed plans for Tryon Creek and Fanno Creek the Willamette River, Johnson Creek and Columbia Slough Watersheds. The plans are finalizing the watershed characterization efforts to provide an assessment of the current conditions of the ecological functions of the watersheds. Next steps include determining

the impacts of the built environment on the health of these functions; analyzing problems and opportunities; and recommending solutions to address these issues.

- City-wide River Renaissance Efforts: The City of Portland is also working to integrate multiple efforts that impact watershed health under an "umbrella" process called "River Renaissance." The focus of the River Renaissance is to develop common work plans that address watershed health, water quality, the City's response to ESA-listings, Willamette Greenway, Portland Harbor Superfund efforts, and the Clean River Plan activities.

C. Accomplishments in Predesign, Design and Construction

As noted in Section II, 23 of the 273 projects in the City's CIP directly related to the CSO Program were active during the fiscal year. To be "active" a project must have been in at least one of the following project phases:

- Predesign
- Design
- Advertise/Bid
- Construction
- Startup / Close Out

Appendix A provides a graphical status check for all of the 273 CSO projects. The major active projects are described in narrative summaries below.

Downspout Disconnections FY 02/03

During FY 02-03, the City implemented the Downspout Disconnection Program in the East Willamette Watershed. The Program focused on areas recommended by the 1994 CSO Facilities Plan (where sumps are installed) while also performing disconnections in neighboring combined sewer areas in addition to the original 1994 CSO Plan area.

In the East Willamette watershed, downspouts were disconnected at 3,102 homes. This activity is estimated to remove about 62 million additional gallons of stormwater per year from the combined sewer system. Of these homes, 783 were located in the original Cornerstone Project area defined in the 1994 CSO Plan. The other homes disconnected are in the new Program area outside of the original Cornerstone area. Finally, 1,433 homeowners (330 from sumped areas) signed up to disconnect downspouts but the work was not completed before the end of the fiscal year. Also, many homes were surveyed and found to have the roof area already disconnected from the combined sewer.

Since the beginning of the Downspout Disconnection Program through June 30, 2003, the Program has disconnected downspouts at over 19,500 homes removing about 390 million gallons of stormwater per year from the combined sewer system. Of these homes, 13,138 were located in the original Cornerstone area while the remaining are in the new Program area. Counting the homes surveyed and those found to have the roof area already disconnected, a total of 39,171 homes have disconnected one or more of their downspouts from the combined sewer system. A

map of the downspout disconnections performed during the entire program period as well as during the past fiscal year is provided in Figure 1.

Willamette Stormwater Inflow Controls Implemented in the CSO Area

BES provided $350,000 in grants to support implementation of 11 commercial stormwater retrofit projects. The demonstration projects remove or substantially reduce runoff from more than 5 acres of roofs and parking lots. The projects were implemented in partnership with the property owners. The total cost of the projects was more than $650,000. Landscape infiltration systems and infiltration swales were the most common technologies employed. The projects also included soakage trenches, a green roof, and a pervious pavement system. BES provided financial support and technical assistance for the projects in order to research the feasibility and cost of stormwater retrofits at existing commercial properties. The final product will be a report summarizing the feasibility, cost, and performance of the projects. The report information will support the planning efforts of the Eastside Inflow Control Program.

Eastside Inflow Controls Predesign Project

This project was initiated as a direct result of the Clean River Plan's Action #3: Reduce stormwater inflow to the Combined Sewer System. Explicit hydraulic models were constructed for all the eastside Willamette combined sewer basins for both existing and future conditions. These models were then coupled with an automated modeling tool to identify potential locations where stormwater inflow controls can be used to cost-effectively reduce basement flooding risk and CSO volumes. Stormwater inflow controls examined include downspout disconnection (including multi-family, commercial, and industrial roofs), landscape infiltration, and street runoff controls. Inflow controls for roofs, parking lots, and streets in the potential target areas were further evaluated with GIS, field, and hydraulic modeling analyses.

The process has been largely completed in Beech-Essex and Oak basins as part of the alternative analysis for the Beech-Essex & Oak Basins Predesign. GIS and initial field analyses have been completed for the remaining basins, with the hydraulic modeling analysis to be completed during the current fiscal year.

Tanner Creek Stream Diversion

The Tanner Creek Stream Diversion project continued with construction of the main separation conduit and final design of the remaining segments. This stream separation project is divided into 5 phases.

- Tanner Creek Phase 1 (from 11th & Lovejoy to 17th & Johnson and the Light Rail Segment): ***Completed***
- Tanner Creek Phase 2 (from 17th & Johnson to 18th & Jefferson): ***Completed***
- Tanner Creek Phase 3 (Sylvan/Canyon to Light Rail): Design is underway for both stormwater/stream quantity and quality facilities and is about at the 70% design stage. BES staff is re-evaluating how stormwater runoff from Highway 26 should be treated before being released to the river.

- Tanner Creek Phase 4 (North side of Washington Park along Burnside): This phase consists of 11,000 feet of new storm sewer pipe, ranging in size from 24"-36" in diameter. Construction started in early July 2002. However, utility conflicts on the narrow Burnside Street corridor forced the cancellation of the construction contract this spring while some telephone trunk lines are relocated. The one-third of the work that remains will be bid during 2004.
- Tanner Creek Phase 5 (From CSO Drop Shaft location at Upshur to 11th & Lovejoy): ***Completed.***

California Pump Station Upgrade

The sewer separation project in the collection system contributing to the pump station was substantially completed in April 2003, and a flow-monitoring network was established to evaluate the quantity of wet weather flow to the California pump station. It is anticipated that flow monitoring will continue until April 2004, followed by the development of a Preliminary Design Report. The current schedule calls for final design of the pump station upgrade project to be completed April 2005, and for construction to be completed August 2006.

Carolina Stream Diversion Project

BES continued the design to separate stream and stormwater from the Carolina Basin (OF#03 & 04) by providing stormwater treatment and conveyance of both the stream flows and treated stormwater runoff to the river. At the 30% design phase, the project team identified the need to verify the modeled flows and confirm the amount of flow the 30% design would remove from the CSO system. Therefore, flow monitors were installed at the locations where the streams enter the combined system to measure stream flows during the period of January to May 2002. During the 2003 fiscal year the model was calibrated and refined. During the 2004 fiscal year the alternatives will be revised and optimized to the most cost-effective configuration for separating this stream system from the combined system.

West Side Willamette CSO Program Projects

The major set of large scale projects to control most of the outfalls along the west side of the Willamette River are managed and coordinated together within the West Side Willamette CSO Program. The specific projects contained in this program and the work accomplished include:

SW Parallel Interceptor

This critical CSO control facility for the Southwest Portland CSO area will control discharges from Outfalls #01 through #07 and is divided into 3 distinct segments that generally parallel Macadam Boulevard. Segment 1 is aligned along SW Virginia from SW Taylors Ferry to SW Sweeney. Segment 2 stretches from Sweeney to Lowell primarily along the railroad right-of-way. Segment 3 will be installed from Lowell to the SW Clay Street drop shaft where it will connect into the Westside CSO Tunnel. Segment 3 pipeline has a diameter ranging from 72-inch to 84-inch and is approximately 8,000 feet in length.

During this past fiscal year, Segment 1 was complete. Segment 2 was completed during FY01-02. Construction of Segment 3, beginning with utility relocation, was initiated FY02-03 and is scheduled to completed late 2004. Sewer and water utility relocation work was completed this past fiscal year FY02-03. Shaft construction for the micro-tunneling is underway and expected to be complete next year.

West Side CSO Tunnel, Shafts, Pump Station and Pipelines

The tunnel will collect and intercept overflows from existing combined sewer and storm outfalls that discharge to the Willamette River from the City of Portland's Central Business District and basins immediately north. The tunnel is approximately 18,000-feet long extending from the area near SW Clay Street, proceeding north paralleling the Willamette River to an area between NW Nicolai Street and NW 26th Street, then crossing underneath the Willamette River to a confluent structure and the Swan Island CSO Pump Station. The tunnel includes the construction of various shafts along the alignment with depths ranging between 100 to 150 feet. Specific shafts include:

- Swan Island Pump station shaft (135 feet diameter approximate)
- Confluent shaft for the West and future East CSO tunnels (45-ft diameter approximate)
- Four drop shafts along the alignment (outside diameter)
    - Clay Street 47-feet diameter
    - Ankeny 39- feet in diameter
    - Upshur 39-feet in diameter
    - Nicolai 60- feet in diameter

Swan Island Pump Station

Located on Swan Island, at the downstream end of the tunnel is a 220 Million Gallon per Day (MGD) dry-pit submersible pump station that transfers flow from the tunnel through a new force main system to existing interceptors (Peninsular Tunnel and Portsmouth Tunnel). The pump station will be designed to accommodate low-flow dry-weather conditions as well as peak wet weather flows up to the design capacity. The pump station design includes surge control equipment, and other site improvements.

Peninsular Force Main

The force main system, constructed as part of this contract, is a dual force main consisting of a 30-inch and 48-inch-inch pipelines up to 1,400 feet in length each that will connect the pump station to the existing Peninsular Tunnel.

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Portsmouth Force Main

A force main system that will connect the Swan Island Pump Station to an existing collection system tunnel and direct CSO to the CBWTP for treatment. The force main system will carry up to 120 MGD of CSO flow and will be complete in 2011. This project was not yet initiated this past fiscal year.

West Side CSO Program Work Accomplished FY02-03

Slurry wall construction for the Nicolai, Upshur, Confluent and Pump Station shafts is completed. Excavation of the Nicolai shaft is completed and the final lining is under construction. The Tunnel Boring Machines have arrived on site and production of the pre-cast concrete tunnel segments is ongoing. Shaft construction at the Clay and Ankeny sites is underway. For the Southwest Parallel Interceptor, the sewer and water utility relocation work was completed. Shaft construction for the micro-tunneling is underway and expected to be complete next year. For the Swan Island Pump Station, the slurry walls are completed.

Influent Pump Station Capacity Improvements

BES is completing revisions to the design for upgrading the CBWTP Influent Pump Station from 105 MGD to 135 MGD capacity to manage the additional flows from the Westside CSO system. Revisions were required to address debris clogging the pumps during low flow periods. In addition, the design work for the Hydraulic Structures elements from Project 5512, Wet Weather Screenhouse was incorporated into the Influent Pump Station Capacity Upgrade to create a single, more efficient construction contract.

CBWTP Wet Weather Headworks

BES completed design of new headworks structure to allow 150 MGD of wet weather flows to enter CBWTP in addition to the current 300 MGD headworks capacity. The wet weather hydraulic improvement structures portion of the CBWTP Wet Weather Headworks project was incorporated into the bid documents for the Influent Pump Station. The current schedule calls for advertising the combined project in January 2004, with construction to be complete no later than 2006.

Eastside Willamette CSO Program

CSO Sizing & Flow Management Predesign Project

This project is charged with developing the sizing, configuration and operation recommendations for designing the Willamette Eastside CSO Tunnel by determining the best balance of stormwater separation, interceptor relief and flow equalization to meet the various bureau objectives for CSO, stormwater quality, and systems operations. The project must provide design recommendations for the interceptor/basin relief, stream diversion and stormwater separation projects that impact CSO flows.

BES constructed and calibrated the new, highly detailed models that cover all combined sewer basins within the Willamette CSO system. This task was accomplished using

BES' new Explicit Model structure, which represents a more sophisticated method than previous modeling efforts to accurately simulate and predict actual stormwater hydrology and system conveyance. After the calibration was completed, future-baseline models were also completed using the calibrated models applied under future conditions. These future conditions models will serve as the basis to conduct alternatives evaluation of the Eastside Tunnel size and system-wide management of the combined sewer flows.

Eastside CSO Tunnel Predesign Project

Preliminary design of the East Side CSO Tunnel was initiated in February 2003. The purpose of this project is to control the overflows at the remaining 14 outfalls to the Willamette River by 2011. The tunnel is expected to be about 5.7 miles long, 18 to 20 feet in diameter, and 85 to 150 feet deep.

The predesign will take the tunnel design from 10% design to 30% design completion. The 30% design documents are scheduled to be complete in July 2004

The focus of this early-stage design effort is to determine horizontal and vertical alignment, connections, and final preliminary design parameters for the East Side CSO Tunnel. The project has collected data on existing utilities, property ownerships, geologic conditions, and hydraulic conditions to develop and evaluate alignments.

The East Side CSO Tunnel Predesign will use the final size recommendation from the CSO Sizing & Flow Management Project in developing the 30% design for the tunnel and related facilities.

Columbia Slough CSO Program

Since the completion of the Columbia Slough CSO facilities, the primary work performed on the facilities consisted of operation, maintenance and monitoring. The large Columbia Slough Consolidation Conduit (CSCC) and the related pumping and conveyance system has performed above the required level in controlling storms equal to and exceeding the 5-year winter storm. There has not been an overflow from the CSCC system since it began operation in October 2000.

North Portland CSO Improvements

The North Portland CSO control facilities were improved last summer to bring them into full compliance with the ASFO performance criteria. During the winter season of 2001-2002, monitoring results showed that the stormwater separation performed in the St Johns, Oswego and Oregonian basins was insufficient to prevent overflows during storms smaller than the minimum allowed by the ASFO. In response to this information, BES analyzed the source of flows and possible solutions through field investigations and detailed modeling. A predesign and design effort was initiated and completed by the end of June 2002. Contract advertisement, bid and award was performed under a special accelerated process so that construction of the new facilities could begin in August 2002. The new diversion structures were completed by October 2002. A detailed report documenting the improvements and the resulting performance measured at that time was submitted to DEQ in December 2002.

Columbia Slough CBOs

Community Benefit Opportunities (CBOs) are specific improvements or enhancements to the community environment that are performed as part of the large CSO construction projects. The enhancement must be related to the CSO project and must be consistent with the mission of the Bureau of Environmental Services. Most CBOs for the Columbia Slough CSO projects were completed in the fall of 2000. One additional CBO Project (#6603) was completed FY02-03. Table 2 below describes the CBOs, their related CSO Projects, and their status.

Table 2 : CBOs Implemented by Columbia Slough CSO Program

Project Number	Project Name	CBO Task Name	CBO Task Description	Status
6182	CSCC Segment 2	Interstate Place Pedestrian Improvements	Construction of a sidewalk on the north side of Columbia Blvd at Interstate Place.	Completed
6182	CSCC Segment 2	CSCC Trail Noise Berm	Place tunnel mining spoils to create a noise berm as a barrier between residential neighborhood and North Columbia Boulevard. The noise berm is west of North Chautaqua Boulevard.	Completed
6183	CSCC Segment 3	Farragut Park Parking Lot Removal	Demolition and regrading of a nuisance parking lot at Farragut Park.	Completed
6184	CSCC Segment 4	Columbia Boulevard Frontage Improvements	Construct walkway from Kenton Park to N Chautaqua Blvd with sidewalks connecting to neighborhood streets. Project includes surface restoration, landscaping improvements, adding street trees, removal of nuisance vegetation and cleaning up years of accumulation.	Completed
6603	CSCC Segment 4B	Penninsular Junction Sidewalk	Construct walkway and landscaping improvements along the south side of Columbia Boulevard from North Chautaqua Boulevard to North Portsmouth Boulevard.	**Completed**
6652	CSCC Segment 4C	Columbia Slough Trail	Construct pathway on top of the levee on the north side of the Columbia Slough from North Denver Ave to North Vancouver Ave.	On hold due to lack of easements
6286	CBWWTF-Wet Weather Facilities	Environmental Enhancements	Construct connecting trails to 40-Mile Loop Trail, construct canoe landing, provide environmental enhancements to area east of CBWTP.	Completed

Combined Sewer Basin Relief & Reconstruction Projects

Basin relief and reconstruction projects in the combined sewer area are intended primarily to control basement and street flooding and address pipe condition and rehabilitation needs. A secondary purpose is to also provide projects that help reduce CSO flows to the river or to CSO

facilities. This is typically done through stormwater management activities and/or inline storage projects that serve to reduce both flooding and CSO impacts. Although these projects are not considered "CSO Program" projects in the CIP, they nonetheless provide on-going reductions in CSO flows and help contribute to a higher level of CSO control.

During this past fiscal year, two major basin systems are under going predesign for basin relief and reconstruction. The two basin areas, the Beech-Essex & Oak basins and the Northwest Neighborhood (Balch, Nicolai, Fremont and Tanner B) Basins are described below.

Beech-Essex & Oak Basin Relief & Reconstruction Predesign Project

This project will perform a detailed basin-wide predesign for the Beech/Essex and Oak combined sewer basins to address significant system deficiencies including basement flooding, pipe capacity problems, and structural condition problems while controlling combined sewer overflows to the Willamette River. The final deliverable will be a predesign report summarizing the work performed and the recommended solutions with an implementation strategy.

During fiscal year 2002/2003, this project developed a comprehensive characterization for local and regional flooding problems, basin conveyance constraints, and the structural condition of sewer. This work included analysis of future impervious area assumptions and the development and refinement of the existing and future Explicit Models for use in analyzing these basins.

Northwest Neighborhood Basin Relief & Reconstruction Predesign Project

This project will develop a recommended plan to alleviate current and potential basement flooding problems, identify repair or replacement requirements for structurally defective pipes, and provide a level of CSO control consistent with the Clean River Plan. The project area consists of Balch, Nicolai, Tanner B and Fremont combined sewer Basins.

During FY02-03, the project team completed the basin characterization task for the physical, hydraulic and hydrologic conditions that contribute to basement flooding and sewer overflows. Basin characterization information was documented in the Basin Characterization Technical Memorandum 3.1. The project also completed TV inspections and assessment of the condition of combined and sanitary sewers. Results were documented in the Condition Assessment Technical Memorandum. We reviewed monitoring data and developed calibrated models. Future base models were then developed. Results were documented in various technical memorandums. We are currently assisting the CSO Flow Management group by developing possible separation options in Northwest basins to remove storm flow from the combined sewer system. This information will be used to evaluate sizing alternatives for the Eastside CSO Tunnel.

D. CSO Operation and Maintenance Activities

During the year the City continued implementation of operation and maintenance practices that reduce the impact of CSOs and stormwater on the receiving streams. These activities capture and remove pollutants, floatables and debris from the stormwater before it is discharged to the

receiving streams from the CSO outfalls. The following information provides the magnitude of the **citywide** effort.

- Sewer Cleaning: 200 miles
- Catch Basin / Inlet Cleaning: 16,600 units
- Drainage Sump/Sedimentation Manhole Cleaning: 1,710 units
- Street Sweeping: 59,400 curb miles

The maintenance activities described above that are performed and recorded specifically in the **CSO area** include the following:

- Sewer Cleaning: 158 miles
- Drainage Sump/Sedimentation Manhole Cleaning: 693 units
- Street Sweeping: 24,200 curb miles

The data to determine the split between the numbers of catch basins cleaned on a citywide basis versus only in the CSO area was not available.

Diversion Structure Inspections and Modifications

The Diversion Structure Inspection Program is designed such that each active diversion structure that can overflow to a receiving water body (approximately 130) is inspected once a week. Diversions that overflow to a downstream facility (approximately 30) and do not pose a risk of direct discharge to the receiving water body are inspected once every two months. Overall, the City performed approximately 7000 diversion inspections last fiscal year.

As a result of Diversion Structure Inspection Program and the flow monitoring system installed on many diversions, the City modified five diversion structures during the past fiscal year to improve performance or address maintenance issues specific to the structure. The diversion structures that were modified are summarized in Table 3 below.

Table 3 : Diversion Structures Modified FY 02-03

Basin	Diversion Name	Latest Status	Location	Date of Change	Comments	Old Orifice Diameter (feet)	New Orifice Diameter (feet)	Old Dam Height (feet)	New Dam Height (feet)
OS	NW20	Active	10440 N Oswego Ave S of Columbia	09-Sep-02	Removed orifice, installed 15" PVC beaverslide and raised dam 5' above existing level	1.3	1.3	2.17	7.7
SJ	NW29	Active	N James & Bruce, in Pier park	12-Sep-02	Installed new channel, poured new reinforced concrete dam. All done to match new underflow pipe out	1	2	2.83	3.8
OR	NW9	Active	N Oregonian, N. of Armour	16-Oct-02	Repaired downstream edge of channel & reshaped invert to match new underflow pipe out. Poured reinforced concrete dam 4' higher as requested.	1.3	2.75	2.17	7.9
CA	SW99	Aban-doned	SW Taylors Ferry & Fulton Park	14-Oct-02	Overflow completely and permanently sealed. No longer diverts to storm pipe.	2	2	2.17	n/a
WO	SW21	Active	SW Moody at Woods	24-Dec-02	Rebuilt dam inside chamber to prevent blocking storm out. Overflow dam set to same height and removed square corner edge into MH.	1.25	1.25	1.1	1.1

Diversion structures have also been modified in a different way in the Southwest portion of the combined sewer system as part of the construction of the Southwest Parallel Interceptor Segments 1 and 2. The construction of this new CSO control pipe required that the total inflow and overflow from some diversions be completely captured by the existing SW Interceptor, the new SW Parallel Interceptor, or both. In many cases, the diversions are configured such that they can no longer overflow to the Willamette River – all flow is contained in the two interceptor pipes. Of the 14 diversion structures impacted, only 3 diversions can directly overflow to the river. In addition, three other locations can overflow via new overflow manholes installed to relieve the SW Parallel Interceptor when it is full. Table 4 below provides a list of the diversions and their respective changes.

Table 4: Diversion Structure Changes Due to the Southwest Parallel Interceptor

ID	Diversion	Location	Flows to	Underflow Pipe (in)	Overflow Pipe (in)	Notes
1	SW48	SW Sweeny & Macadam	SW Interceptor & Carolina OF03	24	58	Connected to the new Sweeney & Macadam structured to provide relief and hydraulic control of SW Interceptor & SW Parallel Interceptor
2	SW50	SW Flower & Macadam	SW Parallel Interceptor	12	n/a	Sealed off, all flow to SW Parallel Interceptor
3	SW52	SW Pendleton & SW Virginia	SW Interceptor & Willamette River	8	18	Upstream flows cut-off by SW Parallel Interceptor
4	SW55	SW Iowa & SW Virginia	SW Interceptor & SW Parallel Interceptor	15	30x30	New SW55A downstream on SWPI: 108" MH w/ overflow weir east to OF03
5	SW57	SW Carolina & SW Virginia	SW Interceptor & SW Parallel Interceptor	12	20	New SW57A, 108" MH w/ overflow weir east
6	SW60	SW Dakota & SW Virginia	SW Interceptor & SW Parallel Interceptor	8		
7	SW62	SW Nebraska & SW Virginia	SW Interceptor	8	n/a	Sealed, all flow to SW Parallel Interceptor
8	SW64	SW Idaho & SW Virginia	SW Interceptor & SW Parallel Interceptor	8	8	
9	SW66	SW Vermont & SW Virginia	SW Interceptor, SW Parallel Interceptor & River	12	30	New 96" MH SW66A
10	SW68	SW Florida & SW Virginia	SW Interceptor	8	n/a	Sealed, new 84"MH SW68A
11	SW70	SW California & Virginia	SW Interceptor	8	n/a	Sealed, all flow to SW Parallel Interceptor
12	SW72	SW Texas & SW Virginia	SW Interceptor	8	n/a	Sealed, all flow to SW Parallel Interceptor
13	SW74	SW Nevada & SW Virginia	SW Interceptor	8	n/a	Sealed, all flow to SW Parallel Interceptor
14	SW76	SW Virginia 105' S of SW Nevada	Underflow to SWPI, overflow to Willamette River	8	8	Overflow discharges to SW79B near California Pump Station

Dry Weather Overflow & CSO Events and Alarms

During this past fiscal year, the Portland combined system experienced an unusual number of dry weather overflow events. In recent previous years, there have been few if any dry weather overflows. However, last fiscal year saw seven events occur from six diversion structures. All incidents were reported to DEQ as required in the NPDES permit. Table 5 below lists the different events that occurred and includes the cause, resolution of the problem, and additional follow-up activities performed to better understand and prevent additional overflows.

Table 5 : Dry Weather Overflow Incidents and Follow-Up Activities

Date	Basin	Outfall	Diversion Number	Street Location	Cause	Resolution	Follow-Up Actions
1/7/03	Insley	28	SE177	20th And Insley	Soft Debris Plug	Cleared Debris	Inspected underflow pipe, required new manhole for access.
1/8/03	California	1	SW79A	Macadam And California	Sand & Gravel Debris Blockage	Cleared Debris	Investigation showed 8" water line break caused debris.
3/11/03	Tanner B	11	WC32	Irving And 12th	Debris Plug	Cleared Debris	Inspected upstream for cause. None found, no food service providers.
4/2/03	Tanner B	11	WC32	Irving And 12th	Debris Plug	Cleared Debris	Inspected upstream for cause. None found.
5/6/03	Riverside	47	EC7	Going Near Denver	Root Ball Blockage	Cleared Root Ball	Rebuild dam and install alarm FY04.
5/27/03	Sellwood	27	SE199	Grand Near Tacoma	Yard Debris Blockage	Cleared Debris	N/A
6/24/03	Woods	6	SW21	Woods And Moody Drive	Brick, Sand & Gravel Debris Blockage	Cleared Debris	Inspected upstream lines for possible failure. None found. Install alarm FY04.

One of the items that BES is pursuing to determine the occurrence of dry weather overflows as well as measure the amount and frequency of CSO discharges from the diversion structures is to install HYDRA level monitors onto the overflow weirs. This concept was originally implemented in the Columbia Slough and North Portland CSO system as a means for measuring any overflow that might occur after December 2000. Level monitors are placed low on the overflow weir to measure the water level as it begins to rise on the weir. If the level is close to overflowing, an alarm is generated by the HYDRA system and broadcasted to the CBWTP operators and to specific BES managers. This approach worked well for determining problem overflows in the North Portland system in the winter of 2001/2002, which were latter addressed by the North Portland CSO Improvement Project in September 2002.

Because of the successful implementation in the Columbia Slough system, BES began to modify the location of the HYDRA SLRTs in the Willamette diversion structures. By the end of FY03, BES had configured eleven diversion structures for DWO/CSO alarms. Table 6 below shows the locations in the Columbia Slough and the Willamette River system where the HYDRA alarms are currently active.

Table 6: HYDRA Alarms for DWO & CSO

No.	HYDRA Station Location	Outfall #	Type of Structure	Receiving Water
	CSCC Overflows			
1	NE 11th & Lombard: Weir OF in CSCC	65	CSCC Overflow Weir	Columbia Slough
2	OF 57: Weir OF in CSCC	57	CSCC Overflow Weir	Columbia Slough
3	N Albina & Kilpatrick: Weir OF in CSCC	62	CSCC Overflow Weir	Columbia Slough
4	Argyle Vent OF60: Weir OF in CSCC	60	CSCC Overflow Weir	Columbia Slough
5	N. Argyle Way	n/a	Flow Diversion to CSCC	n/a
6	N Col & Bayard: Weir OF in CSCC	59	CSCC Overflow Weir	Columbia Slough
7	N Chau Pl OF58: Weir OF in CSCC	58	CSCC Overflow Weir	Columbia Slough
	North Portland Overflows			
8	N Oswego: NW20 Depth on dam	55	Diversion Structure NW20	Columbia Slough
9	N Oregonian: Water depth on dam	56	Diversion Structure NW9	Columbia Slough
10	Pier Park OF54: Depth on Dam	54	Diversion Structure NW29	Columbia Slough
	Willamette Diversion Overflows			
11	SE 10th & Stark	38	Diversion Structure SE16A	Willamette River
12	SE 17th & Tibbets: Depth on Dam	30	Diversion Structure SE145	Willamette River
13	SE 9th & Madison	36	Diversion Structure SE46	Willamette River
14	SE Insley & McLoughlin	28	Diversion Structure SE175	Willamette River
15	N. Hancock & Flint	43	Diversion Structure EC93	Willamette River
16	NE 14th & Pacific	40	Diversion Structure EC109	Willamette River
17	NW 21st & Sherlock	15	Diversion WC100A	Willamette River
18	NW 11th & Everett	11	Diversion Structure WC7	Willamette River
19	SW Sheridan & Moody: SW Interceptor	6	Interceptor Relief	Willamette River
20	SW Taylors Ferry: Depth on Dam	1	Diversion Structure SW78	Willamette River
21	Waverly Golf Course	26A	Diversion Structure SE195	Willamette River

E. Public Involvement, Education and Information Activities

As the focus of the CSO construction program shifts to the west side of the Willamette River, CSO public involvement activities have changed to meet the needs of individual West Side CSO projects. The goals listed below are met through the public information and involvement activities:

Goal 1: Inform and involve residents and businesses in West Side CSO construction areas and the broader public about key issues such as noise issues, construction schedules and traffic plans.

Goal 2: Develop and maintain good working relationships between the public and project team members.

Goal 3: Meet construction timelines and minimize community impacts.

Goal 4: Respond to individual citizen or business concerns within 24 hours.

Goal 5: Help complete projects on time and within budget.

Public involvement plans have been developed for each West Side CSO project. Outreach activities for the West Side Willamette River CSO Projects continued during the past fiscal year. The projects included the West Side CSO Tunnel (West Side Big Pipe), the Swan Island Pump Station, tunnel access shaft construction for four Westside location and one eastside location, Southwest Parallel Interceptor and the Tanner Creek Stream Diversion.

Outreach activities began during predesign and design and continue into the construction phase. Outreach provides businesses, residents and neighborhood groups with project information and opportunities to give input on project decisions, including construction mitigation measures and traffic plans. These activities are tailored to the needs of and impact to area communities and have included:

- **Databases** - Developed 7 new databases containing over 3,800 residents and businesses. This information helps the bureau keep business and residential property owners, neighborhood, business and tenants associations and other stakeholder organizations within the project area informed about the project.
- **Project Fact Sheets** - Developed 16 project fact sheets and distributed them to over 128,000 citizens and businesses to provide an overview of the CSO program, background information on the project, the purpose of the design and construction phases.
- **Project advertising –** The bureau developed an interpretive new print advertisement to educate the public about the Westside CSO projects. Ads were run in the Oregonian, The Skanner and the Portland Tribune newspapers.
- **Project Presentations/Tours** - The West Side CSO Project provided 5 tours with 147 participants. They were provided with a PowerPoint presentation and view of the Nicolai Shaft construction site. In addition, 4 guided boat tours were provided to 120 participants.

- **Citizen Advisory Committees** - BES continues to meet regularly with the Businesses for Clean Rivers Advisory Committee. This committee provides direct feedback and advice during our construction phase of the tunnel and shafts projects. In addition, the CBO Selection Committee recommended eight projects for construction through the Community Benefits Opportunity Program.
- **Community Presentations** - Provided 23 presentations for 460 meeting participants representing neighborhood, business and tenant associations as well as to other key stakeholder groups within the project area to provide an overview of the CSO program, the project and design and construction issues.
- **Public Meetings** - Held 3 meetings during project design and construction phases to provide more detailed information on final design and construction and solicit concerns and ideas regarding the project.
- **Site Visits** - Conducted 203 site visits with businesses and residents along construction routes and within the project area to resolve design and construction issues. These issues include business and residential access, parking, construction hours and traffic management.
- **Community Benefit Opportunities** – The bureau awarded funding for eight projects in areas impacted by the construction of the Westside CSO projects. Projects range from street calming to tree planting.

In addition to involving impacted communities in CSO project decisions, the Bureau is committed to educating the public about environmental issues.

- **Educational Presentations** focusing on water quality issues were provided to Portland schools and community groups. Environmental Educators made over 700 presentations. A special Combined Sewer Overflow presentation is available for students in grades 6 to 12. Students learn the history of the CSO problem, talk about solutions, and how they can help. More than 7,200,000 students were contacted with information about river pollution problems during the fiscal year. An additional 11,000 students received the all school assembly program entitled “River Heroes.” The School Assembly Program includes a new, original story about the history of the CSO project in Portland.
- **CSO video**: The CSO video is being updated and will be ready for release in Fall 2003.
- **CSO documentary**: A 20-minute documentary is being developed about the Westside CSO project. The film will be completed in 2006.
- **Educational Tours** of the Willamette River were provided to youth and adult groups who have received presentations and learned about the City’s CSO program. Typically any youth group that wants to do a jet boat tour is required to first receive the “It’s an Overflow” program as a prerequisite. More than 700 students participated in boat trips.
- **OMSI display** – OMSI exhibit staff is developing a CSO exhibit that will be housed in the museum’s Earth Science Hall (just outside the Watershed Lab). The exhibit will highlight the CSO program components. The display will open in October 2003.

Public Notification/River Alert Program includes 55 CSO identification signs that indicate where outfall pipes are located. It also includes 14 folding signs with the message "WARNING:

SEWAGE" and the River Alert Hotline number, 503-823-2479. The public can call the hotline at any time to hear a message about the CSO program and to learn if a CSO advisory is in effect. The folding signs are opened and closed every time there is an overflow from May 15 to October 15 each year. During the winter months, the signs remain open with the message in view for boaters and other river users. The River Alert program notifies the media by fax and email every time there is an overflow from May 15 to October 15. The Oregonian newspaper publishes an overflow icon on the top of the weather page when overflows occur. In addition, people with Internet access can visit the Environmental Services home page at http://www.cleanrivers-pdx.org to learn if a CSO advisory is in effect.

- **Clean River Projects Construction Signage** requires contractors to post signage at any sewer system-related construction site with the Clean Rivers message to inform the public that the construction is a sewer project designed to keep our rivers and streams clean.
- **Media Relations** draw the media's attention to CSO projects. Media advisories, news releases and media events are used to alert the media about CSO projects. Individual briefings are also held with reporters. The City provides timely, accurate responses to all media requests and keeps files of all newsprint and broadcast media coverage. This past year, 33 media notifications regarding combined sewer overflow projects were released. Seven were related to actual combined sewer overflows during the summer notification period.
- **Three CSO media events** were held in the last year.

    1. In November 2002, Environmental Services began construction on the West Side CSO projects on Swan Island, the site of the new CSO pump station. Environmental Services invited media, City employees and employees of the construction contractor to a formal groundbreaking event on Swan Island.
    2. In May 2003, Environmental Services held a community recognition event to mark the start of construction on eight Community Benefit Opportunity Projects nominated by communities affected by West Side CSO construction.
    3. In June 2003, Environmental Services held a media backgrounder to bring reporters up to date on West Side CSO projects.

- **Bill Inserts** with updated information about upcoming West Side CSO construction were enclosed in water/sewer bills from June 2002 through August 2002 to provide residential customers with updated construction information. The inserts were delivered to 165,000 customers in the summer of 2002.
- **The Internet** provides current information about the City's CSO programs to the general public. Environmental Services has a website dedicated entirely to CSO construction projects, schedules, and impacts at http://www.cleanriverworks.com in addition to main BES website at http://www.cleanrivers-pdx.org.

V. Planned Efforts for Current Fiscal Year

Fiscal Year 2002-2003 activities to reduce CSO continue the implementation of the 20-year program to plan, design, construct, and operate Portland's CSO control system. The activities this fiscal year can be briefly summarized as follows:

- Continue large scale construction of the West Side Willamette CSO Tunnel and Swan Island Pump Station
- Continue design of the East Side Willamette CSO Tunnel System
- Continue operating, maintaining and monitoring the Columbia Slough CSO System to assure compliance with the ASFO and the NPDES Permit
- Continue implementation of stormwater inflow reduction projects in the form of the Downspout Disconnection Program

The current work is divided into the same five subsections used for the previous year's efforts.

A. ASFO Milestones to be Achieved

This fiscal year contains one ASFO milestone – submitting the Annual CSO Progress Report:

- ASFO Section 12.a (11): "By no later than September 1 of each year that this Amended Order is in effect, the City shall submit to the Department and to the Commission for review an annual progress report on efforts to eliminate untreated CSO discharges, subject to the storm return frequencies specified in Paragraph 12.a. of this Amended Order."

B. Program Planning to be Accomplished

CSO Program level planning will continue during the current fiscal year. The activities that will support the CSO Program include:

- Portland's Clean River Planning Efforts: The CSO Program staff will be working with the BES Planning Group to further integrate the stormwater elements of the CSO Program into the watershed approach directed by the Clean River Plan.
- The BES Planning Group will continue the top priority planning efforts to further refine the Clean River Plan. These efforts consist of the Willamette River Watershed Plan, Tryon-Fanno Watershed Plan, and the BES Monitoring Plan.
- The City of Portland will also continue the new efforts to integrate key city functions that impact watershed health under the River Renaissance. BES is one of three bureaus serving as the executive committee for the River Renaissance Management Team.

C. CSO Projects to be Predesigned, Designed and/or Constructed

The CSO control projects that will be in the predesign, design and/or construction phases during the current fiscal year include:

- During FY 03-04, the Downspout Disconnection Program will continue to disconnect downspouts at homes in the East Willamette Watershed served by the combined sewer.

In addition, staff will implement a survey of thousands of homes in the Columbia Slough Watershed served by the combined sewer. The purpose of the survey is to check the status of downspout disconnection work completed at homes between 1996 and 2000 as well as to collect additional information on roof area removed from the combined sewer.

- Tanner Creek Stream Diversion: Continue construction on Phase 4 (Nicolai basin / Burnside) and continue design on Phase 3 (Sylvan /Canyon) segments of the Tanner Creek Stream Diversion Project.
- Carolina Stream Diversion Project: Explicit modeling information and data from flow monitors installed last fiscal year will be used to refine and calibrate a new Carolina Basin model and develop alternatives to evaluate cost-effective separation and stormwater treatment options.
- The Eastside Inflow Controls Predesign Project: Models for each individual Eastside CSO basin will be built and an automated modeling process used to determine cost effective locations for stormwater inflow controls. Elimination of basement flooding and reductions in CSO operating costs will be the primary cost-effectiveness criteria, with inflow control costs being compared to a pipe-only conveyance alternative. Specific sites and inflow control technologies will be recommended based on GIS, hydraulic modeling and field analyses.
- Willamette Stormwater Inflow Control Projects in the CSO Area: Complete a stormwater inflow control project at SE 52nd Avenue to relieve local basement flooding as an alternative to increasing the size of the local combined sewer. The project is to divert runoff from 0.8 acres of streets to a landscape infiltration area. The budget for the project is approximately $200,000. BES will also begin predesign for 4 additional inflow control projects recommended by the Holladay, Stark, and Sullivan Basins Predesign for Basement Flooding Relief. The projects will include street inlet controls, residential downspout disconnection, and commercial stormwater retrofits.
- Southwest Parallel Interceptor: Continue construction of the third and final component - Segment 3. Continue shaft construction along the alignment and begin micro-tunneling of the pipeline for Segment 3. Once completed, the Southwest Parallel Interceptor will discharge directly into the Westside CSO Tunnel at the Clay Street Dropshaft and will help control CSO from OF#01 through OF#07.
- West Side Willamette CSO Program: Complete construction of the slurry walls, excavation and final concrete lining for the Upshur, Ankeny, Clay and Confluent shafts. The Tunnel Boring Machine assembly and excavation will begin for the two tunnels drives from the completed Nicolai shaft. One tunnel drive will be under the river towards the northeast, the second drive will be toward the south under Naito Parkway. The excavation and final liner construction for the Swan Island Pump Station will also begin this fiscal year.
- Preliminary Design of the East Side Willamette CSO System will be continued this fiscal year through two parallel activities that are scheduled to be completed in FY03-04.
    - **CSO Sizing and Flow Management Predesign Project**: Submit the recommended size of the Eastside CSO Tunnel diameter to the Predesign Project Team in January 2004 with elements including a real-time control system configuration and the

recommended series of inflow reduction projects. Examples of these projects include basin stream separation, stormwater separation, and inflow controls. This project will also complete a system-wide model calibration memorandum describing the new, highly detailed Explicit Model with its assumptions and calibration results. The project will complete the Characterization Report to provide the latest estimated flows throughout the combined sewer system and the information required to develop and evaluate alternatives for sizing the Eastside CSO Tunnel and for operating Portland's entire combined sewer system.

- **East Side CSO Tunnel Predesign Project:** Preliminary design to 30% will continue through June 2004 including the final sizing of the tunnel, shaft location, designing the tunnel lining, pipe connections from the existing sewer system to the tunnel, verification of the system performance, identification of properties and easements to be acquired, further development of construction drawings, and initial evaluation of the construction bidding methods. Once this project is completed, the East Side CSO Tunnel final design project will later take the tunnel from 30% design to 100% design with construction drawings completed by December 2006.

- Portsmouth Force Main Predesign Project: This new force main system will connect the Swan Island Pump Station to the existing Portsmouth Tunnel to direct up to 120 of CSO to CBWTP for treatment by December 2011. Preliminary design work will begin this new fiscal year and will focus on selecting an alignment for the force main pipe system.
- Influent Pump Station Upgrade: Work to be completed FY03-04: Prepare final contract bid documents, award and begin implementing construction contract.
- Basin Relief & Reconstruction in the CSO Area:
  - Beech-Essex & Oak Basin Predesign: Develop practical and cost-effective recommendations for pipe rehabilitation, flood relief and CSO control improvement. Predesign work will include analysis of various alternatives including: separation with water quality treatment, inline detention, pipe upsizing, and inflow control technologies. From the alternatives evaluation, a recommended basin collection system control plan will be further developed into a Final Predesign Report that serves as a valid foundation for final design.
  - Northwest Neighborhoods: Complete separation analysis for the Flow Management project including costing of separation options. Refine separation alternatives for CSO to eliminate basement flooding and replace structurally deficient pipes. Evaluate other potential options such as local pipe solutions and inflow controls. Analyze water quality treatment options for separated storm water. Identify right–of–way requirements. Predesign to be completed December 2004.

D. CSO Operation and Maintenance Activities Planned

During the current fiscal year the City will continue the implementation of operation and maintenance practices that reduce the impact of CSOs on receiving streams. This Citywide effort is expected to complete the following estimated project work:

- Sewer Cleaning: 200 miles

- Catch Basin/inlet Cleaning: 16,000 catch basin/inlets
- Drainage Sump Cleaning: 1,800 sumps/sedimentation manholes
- Street Sweeping: 60,100 curb miles
- Diversion Structure Inspections: Perform weekly inspections on all active diversion structures that directly overflow to the receiving stream; perform routine inspections on all other active diversions as needed for maintenance and proper performance

New HYDRA Alarms on Diversion Structures

BES intends to continue to install HYDRA SLRTs (Sewer Level Remote Telemetry) on diversion dams that represent large CSO overflow volumes, frequency, possible DWOs, and diversions that are difficult to inspect where the dam is not visible from the surface. The entire list of active diversions inspected weekly was examined for inflow & orifice diameter (indicates volume of CSO), and inspection history to develop a priority of diversions for installing level monitors and configuring them for CSO measurement & DWO alarms. The proposed list of 15 locations is provided below in Table 7. Note that this list may change based on costs and difficulty of installation. Costs to install each new SLRT and configure it as a HYDRA alarm is approximately $37,000 per location. These 15 locations are expected to cost $550,000 total.

Table 7: Proposed Diversion Locations for New HYDRA Alarms

Priority Rank	Basin	Diversion	Outfall	Location	Inflow Diam.	Orifice Diam.	Orifice Elev.	Dam Height
Diversions For Installing New SLRTS FY03/04								
#1	WO	SW21	6	Woods and Moody Drive	36	1.25	26.92	1.18
#2	L1	SE183A	27	Lents Trunk / SE Relieving Interceptor	61.99	N/A	50.2	2.5
#3	AD	SE102	35	2nd and Salmon	16	0.979	24.23	0.46
#4	OK	SE14	38	3rd Near Ash	38	1	26.51	1.44
#5	TD	SE135	30	Taggart and Clinton	16	1	30.82	0.84
#6	SH	M9	7	Sheridan and Water	60	N/A	38.8	1.25
#7	TA	SE165	30	16th and Center	54	2	27.81	1.6
#8	SJ	SJ22	50	Burlington Near Edison	14	1	71.12	0.7
#9	SJ	SJ9	53	Reno 300ft West of Edison	24	0.96	64.2	0.93
#10	BE	EC12	46	Greeley 550ft from Interstate	48	1.323	52.17	2.04
#11	CR	SW48	3	Macadam and Sweeney	58	2	38.79	1
#12	SJ	SJ17	52	Philadelphia 110FT E. Decatur	15	1.25	68.11	0.67
#13	SU	EC102	40	Union and Glisan	10	0.667	65.5	0.33
#14	TD	SE133	30	Milwaukie Near Woodward	28.25	0.667	31.38	0.497
#15	RI	EC7	47	Going Near Denver	30		105.25	1

E. Public Involvement Activities Planned

BES will continue to educate and identify opportunities for Portland residents, businesses and neighborhood groups to participate in CSO and watersheds enhancement projects. The City will expand efforts to increase citizen participation in project decisions, raise awareness about watershed issues and encourage citizens to become stewards for the Portland watershed. The Bureau will work closely with Neighborhood Coalition Offices and Associations to raise awareness about the CSO program, gain active public input on project decisions, and involve more citizens, businesses and neighborhood groups in watershed protection and restoration efforts. This year's activities include:

- Work with citizen committees and work groups to address issues regarding CSO project designs and construction plans. This will include initiation of community involvement and outreach for the East Side CSO Tunnel Predesign now underway.
- Continue support of the Businesses for Clean Rivers Advisory Committee.
- Develop informational materials that explain CSO projects, time lines, construction mitigation plans and opportunities to enhance impacted communities.
- Implement public awareness campaign (known as the Big Pipe campaign) to alert communities to the West Side CSO construction. The campaign will include newsprint, theater, transit and billboard advertising and outreach to small media outlets.
- Implement the Willamette Stormwater Inflow Control Projects to encourage and assist commercial and industrial property owners in the combined area to remove stormwater from the combined system by creating on-site stormwater infiltration facilities. These facilities use more natural systems like swales, wetlands and native vegetation to detain and treat stormwater.
- Implement the Community Benefits Opportunity Program projects for the Westside CSO projects. Begin a process for a Community Benefit Opportunity Program for the Eastside CSO Tunnel Project.
- Provide educational CSO classroom presentations and assembly program; develop a new CSO classroom activity that focuses on the history of sewers and implementation of the CSO solutions in Portland.
- Provide information to the public about the CSO program through special displays and computer kiosks in high traffic areas such as Pioneer Courthouse Square.
- Provide watershed walks, guided tours of project sites, and jet boat tours.
- Continue CSO River Alert signage and notification program.
- Distribute Citywide newsletters and quarterly bill inserts that inform citizens about the CSO program, watershed restoration activities and how citizens help protect Portland watersheds.
- Develop a speakers bureau / watershed workshop to highlight City of Portland water quality issues and projects such as the CSO Program to improve the Willamette River.
- Evaluate the option of hosting a Waterfront Festival that focuses on the health of the Willamette.

VI. Conclusions

This past fiscal year, the City has fully engaged constructing the multiple large-scale facilities for the West Side CSO Program. At Swan Island, at Terminal 1 near NW Nicolai, at NW Upshur, at Ankeny Pump Station next to the Burnside Bridge, and at SW Clay & Market within a small traffic median, the City is constructing massive drop shafts 120 feet down to the future West Side CSO Tunnel. At the same time, the City is also completing Segment 3 of the SW Parallel Interceptor and the remaining phases of the Tanner Creek Stream Diversion Project. These activities are in addition to the smaller projects and the operating and maintenance activities Portland performs on an annual basis. Due to this effort, the capital expenditures for the CSO Program are expected to be about $90 million this fiscal year as well as the next few years. These costs are in addition to the approximate $350 million in capital costs already expended for the Cornerstone Projects and the Columbia Slough CSO system.

In the midst of the massive construction efforts, Portland has completed several ASFO milestones that mark the 12th year of this 20-year program to control CSO. Portland's effort has resulted in significant and measurable water quality improvements to the Columbia Slough and Willamette River. The additional summary accomplishments include:

- Completed projects to ensure the North Portland CSO system meets and exceeds the required level of CSO control for the Columbia Slough.
- Initiated detailed predesign efforts to size, configure, locate and operate the East Side Willamette CSO system for the 2011 ASFO deadline.
- Continued reduction of the annual CSO discharges through on-going implementation of the Downspout Disconnection Program in the combined areas outside of the original 1994 CSO Facilities Plan recommended area.
- Continued design of the West Side Stream Diversion Projects (Tanner Phase III and Carolina)
- Continued to complete on schedule each SFO/ASFO milestone that has become due since 1995.

APPENDIX A

CITY OF PORTLAND - BES

CSO Capital Improvement Program Implementation Schedule

(Appendix A contains 33 pages including this title page)