CITY OF PORTLAND
COMBINED SEWER OVERFLOW PROGRAM

ANNUAL CSO PROGRESS REPORT TO DEQ

FISCAL YEAR 2008-2009

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

CITY OF PORTLAND
BUREAU OF ENVIRONMENTAL SERVICES

JUNE 30, 2009

Annual CSO Progress Report to DEQ for FY 2008-2009

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I. Summary

Portland's Combined Sewer Overflow (CSO) Program has completed the 18th year of the 20-year program to control all CSO discharges by December 2011. As of June 2009, the City estimates it has reduced the average annual CSO volume since 1990 from 6.0 billion gallons to 2.05 billion gallons per year (65.8% reduction).

During the past fiscal year (2008-09), the City continued the activities necessary to meet the final ASFO requirements for controlling the last 19 CSO outfalls by December 2011. This work is centered on the construction of the East Side CSO Tunnel System. The City completed 18,000 feet of tunneling from the mining shaft at OMSI, and completed some of the remaining consolidation conduits that will bring CSO to the four drop shafts to the north: Alder, Steele Bridge, River Street, and Port Center.

This past fiscal year BES invested $95 million into the CSO Program. This was $40 million less than expected due to postponement of work on the Portsmouth Forcemain and cost savings on the East Side Tunnel. Next fiscal year, BES expects to invest $170 million. This number is higher than previously reported because some projects are costing more than anticipated and the remaining projects are to be constructed in a compressed timeframe to meet the 2011 deadline.

This 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 2009 include:

- **East Side CSO Tunnel**: The tunnel boring machine (TBM) completed 9,158 feet more (17,826 total) of the 20,230 foot north tunnel drive from the Opera Shaft to the Port Center Way Shaft on Swan Island.
- **Tunnel Shafts**: Shaft excavation to tunnel depth was completed for all the shafts (Alder, Steel, River Street, Port Center, Taggart and McLoughlin) sites.
- **Consolidation Pipelines and Diversion Structures:** Completed several shafts and micro-tunnel drives required to bring CSO to the major tunnel shafts.
- Completed 10 **Sustainable Stormwater Program** projects that remove and infiltrate stormwater runoff from streets, parking lots, and roofs in the combined system
- Since December 2006, six overflow events have occurred from the West Side controlled outfalls – five during the winter season and one during the summer season. The West Side system performance is averaging 2-overflows per winter and 1-overflow-per-3 summers, which meets and exceeds the required performance in the ASFO and the NPDES permit.
- BES will be submitting an updated Demonstration of Compliance report in December 2009 to provide a more robust review of how the CSO system has actually performed.

The City of Portland has completed each of the 29 milestones required in the ASFO (see last page of Appendix A for full list) that have come due through June 30, 2008. One outstanding item (which is not a requirement) is a new Update to the CSO Facilities Plan Report. This report

will be incorporated into the September 2010 Updated Facilities Plan required by the ASFO to describe how the City will continue to improve CSO control after December 2011.

Portland's CSO Program is on schedule and moving aggressively through the final phase of controlling the Willamette River CSO outfalls. The significant activities we expect to complete next fiscal year ending June 30, 2010 include:

- Complete the long tunneling drive north to the Port Center Shaft from the OMSI/Opera mining shaft towards the north and begin the southern segment to McLoughlin Shaft.
- Begin construction on the Swan Island CSO Pump Station Phase 2 electrical and mechanical upgrades for 2011.
- Begin construction on the two segments for the Portsmouth Force Main
- Begin construction on the Balch Consolidation Conduit (BCC)

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, operations, and maintenance activities performed by the Bureau of Environmental Services (BES) operating programs for the combined sewer and CSO systems during the past 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 08-09	Projects Open During FY 08-09
Combined Sewer Overflow	332	48
Maintenance and Reliability	592	89
Sewage Treatment Systems	459	66
Surface Water Management	238	77
Systems Development	292	50
Total	**1913**	**330**

At the end of fiscal year 2008-09, there were 1913 individual projects listed in the CIP and 330 projects open during the year. For the CSO Program, there were 332 CSO projects listed in the CIP (see Appendix A for the CSO Capital Improvement Program Implementation Schedule). The 332 CSO projects represent the CSO Management Program, as it currently exists within the City of Portland in terms of CIP activities. Last year there were 339 CSO projects listed at the end of the year, this year 332 CSO projects are listed. This change occurred when some projects were transferred to the Maintenance & Reliability Program because their scope of work was more to reduce basement flooding instead of controlling CSO.

This report focuses primarily on the accomplishments of the CSO Program 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 other projects are not extensively covered in this report.

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 rainfall year.

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 two-thirds citywide. In the Columbia Slough, CSO events have been eliminated for storms smaller than a 5-year winter or 10-year summer return frequency.

With the completion of the Westside CSO system and supporting projects in 2006 and the on-going work for the Expanded Downspout Disconnection Program, CSO discharge volumes to the Willamette River have been reduced (as of June 30, 2008) from 4.8 billion gallons per year (1990 estimate) to about 2.05 billion gallons per year, based on average annual rainfall. This represents an annual system-wide reduction of nearly 66% since 1990.

The Amended Stipulated Final Order (ASFO) contains a firm schedule by which CSO controls must be implemented within 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. [Milestone completed.]
- 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 completed and construction underway.]

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, 2008 and ending June 30, 2009 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 three ASFO milestones 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 08-09 milestones was #29

In fiscal year 2009, BES addressed one ASFO milestone:

- Milestone #29 – Submit 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. Accomplishments in Program Planning

The CSO Program continues to execute planning projects for facilities and activities that will cost-effectively reduce CSO and assure that the Program meets our regulatory obligations. Planning activities performed during Fiscal Year 08-09 include the following:

Portland's Facilities/System Planning

The Asset Systems Management Division in the Engineering Services Group, which is responsible for Facilities Planning, initiated in 2005 the update to the Combined, Sanitary, Stormwater, and Treatment Systems Plans. With assistance from CH2M HILL for management and expertise support, and Brown & Caldwell for CMOM support, BES is completing this 3-year effort to produce a detailed Public Facilities Plan that is integrated with the Portland Watershed Plan and incorporates asset management techniques. At the time of this report, the Combined System Plan is approximately 90% complete and the Sanitary System Plan is 80% complete. The Stormwater System Plan, focused on the separated (non-combined) areas, began in 2009.

CBWTP Facilities Plan Update

The City is developing a comprehensive update to the Columbia Boulevard Wastewater Treatment Plant (CBWTP) facilities plan. This effort examines the liquid and solids processing necessary to meet NPDES requirements and managed expected loadings in 2011, 2015 and 2020. The 95% Draft Report was completed in 2008, and the final report will be completed this fiscal year.

C. Accomplishments in Predesign, Design and Construction

As noted in Section II, 55 of the 332 projects in the City's CIP directly related to the CSO Program were open and 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 339 CSO projects. The major active projects are described in narrative summaries below. The small number of active projects reflects the maturity of the CSO Program as it nears the end of the program.

Downspout Disconnection FY 08/09

During FY 08/09, the City continued the Downspout Disconnection Program in the East Willamette and Columbia Slough Watersheds. The Program was active in all eastside combined sewer areas, including those originally recommended by the 1994 CSO Facilities Plan (where sumps were installed).

Downspouts were disconnected at 523 properties. Of these properties, 296 were located in the original Cornerstone Project area defined in the 1994 CSO Plan and 227 were in the new Program area. This is estimated to remove about 14 million additional gallons of stormwater per year from the combined sewer system.

As of June 30, 2009, there were 25,575 properties representing 52,695 disconnected downspouts that have been approved through the Downspout Disconnection Program, removing about 585 million gallons of stormwater per year from the combined sewer system. In addition, more than 34,500 surveyed homes have been found to have one or more downspouts already disconnected or other onsite stormwater management, resulting in an estimated 1.2 billion gallons of stormwater removed from the system annually.

Sustainable Stormwater Management Program (SSMP)

BES has organized several parallel efforts to implement green solutions and stormwater inflow controls into a single integrated program titled the Sustainable Stormwater Management Program (SSMP). There are three primary program areas:

(1) Pilot / Field Projects

(2) Policy and Technical Assistance

(3) Education and Outreach related to sustainable stormwater strategies.

Staff has also developed a monitoring program to document how much the different projects contribute to CSO reduction goals.

The Sustainable Stormwater Program includes three CIP projects described in previous CSO annual reports: the Eastside Inflow Controls Predesign Project (completed spring 2007); and the Holladay, Stark, and Sullivan Inflow Controls Project. The program also includes the Innovative

Wet Weather Program, which began implementation in FY05 and is funded by the City's operating budgeted and EPA grant funds.

Innovative Wet Weather Program (IWWP)

The IWWP is funded through an EPA grant for innovative projects that demonstrate sustainable, low-impact stormwater management solutions. Funds have been earmarked for projects in three categories: Water-quality Friendly Streets & Parking Lots, Downspout Disconnections, Bioswales and Ecoroofs. [No IWWP projects were completed in the CSS during FY08-09].

Holladay, Stark, and Sullivan Inflow Controls Projects

In 2002 BES completed an engineering predesign analysis to address capacity problems in the combined sewer serving the Holladay, Stark, and Sullivan basins. The predesign recommended a number of local stormwater management projects to protect residents from sewer backups.

In 2003 BES completed the first project, diverting runoff from 0.8 acres of paved surface into a landscape infiltration basin near Glencoe School. The project protects residents on SE 52nd from sewer backups and preserves capacity in the East Side CSO Tunnel. The second project, completed in 2007, protects residents on SE Pine Street by managing runoff from more than two acres of asphalt and roofs at Tabor Middle School. The project included infiltration planters and swales at the school as well as a vegetated stormwater curb extension and sump to manage street runoff.

Three additional projects are in design. The projects will protect residents from sewer backups in the vicinity of Laurelhurst School, NE 45th and Davis, and SE 56th and Ankeny. They include almost thirty green streets facilities and two private stormwater retrofits. Construction of the right-of-way elements is scheduled for late 2010 or early 2011 to be followed by construction of the private retrofits.

Sustainable Stormwater Management Program (SSMP) Projects

1% for Green (1%) Projects

- Installed two new green street curb extensions in partnership with the Bureau of Transportation to combine stormwater management with traffic and pedestrian safety improvements. The extensions located at NE Royal & 43rd, manage 4,300 square feet of street area.

Grey to Green Initiative (G2G) Projects

Grey to Green is an acceleration of Environmental Services work to add green infrastructure. The bureau will invest $50 million over five years in ecoroofs and green street facilities, street and yard trees, removing invasive vegetation and restoring native

plants, and acquiring and protecting sensitive natural areas.

- One curb swale was installed at NE 31st & Davis managing 2,700 square feet of street runoff and was initiated as part of our Community Request Program.
- One green street curb extension was installed at NE Glisan & 63rd managing 11,000 square feet of street runoff.

Community Benefit Opportunity (CBO) Projects

- Installed three new green street curb extensions along SW Virginia at SW Florida and SW Nebraska. The three facilities manage a combined 10,500 square feet of street runoff.

Willamette River CSO Program Projects

The Willamette River CSO Program has been designed to control the original 42 CSO outfalls that previously discharged to the Willamette River. The first two phases of this program have been completed with seven outfalls controlled in 2001 and 16 outfalls controlled in 2006. The remaining 19 outfalls will be controlled by the East Side CSO Tunnel as well as smaller projects outside the alignment of the tunnel.

Balch Consolidation Conduit

The Balch Consolidation Conduit (BCC) will capture CSO discharges previously going to the northwest Outfall 17 and convey the flow to the West Side CSO tunnel via the Nicolai drop shaft structure. This new pipeline size will be 84-inches in diameter and will be a micro-tunnel similar to the Southwest Parallel Interceptor. The upstream end of the BCC will be in the heart of the Balch CSO basin near the intersection of NW 29th Avenue and NW 29th Avenue. This location allows the BCC to also provide local basement flooding relief as well as collect all CSO from the basin. The new alignment will require the BCC to be 7,000 feet in length.

Design was completed in the Spring 2009. Construction began in June 2009 with a projected completion scheduled for December 2010.

CBWWTF Wet Weather Headworks (Wet Weather Screenhouse)

The Wet Weather Headworks will be part of the work to be completed on the CBWTP–CBWWTF site for the 2011 deadline. Construction began earlier this fiscal year and is scheduled to be completed in 2011.

East Side Willamette CSO Program

East Side CSO Tunnel Project

The purpose of the East Side CSO (ESCSO) Tunnel is to control CSO discharges at 13 outfalls to the Willamette River by 2011. (Previously there were 14 outfalls, but Outfall 31 was sealed off during a local maintenance project.) The tunnel will be 29,530 linear feet (5.6 miles) long, 22 feet in diameter, and 85 to 165 feet deep. Once construction is completed in 2011, the project will allow discharge from only four of the 13 outfalls during large storm events. The four active outfalls will meet or exceed the ASFO performance standard for controlling CSO to the 3-year summer storm and the 4-per-winter storm.

The contractor, Kiewit/Bilfinger Berger JV (KBB), continued work in all areas of the project this reporting year. Below is a list of the major work accomplished for the reporting period ending June 30, 2009.

Tunnel: The tunnel boring machine (TBM) completed 9,133 feet during the reporting period. A total of 17,826 feet of tunnel has been completed since the start of the project. The TBM reached the River Shaft in November 2008 and was serviced. The TBM left the River Shaft in January 2009 on route to the Port Center Shaft. The pre-cast concrete tunnel segments were completed in June 2008.

Tunnel Shafts: The temporary support system for the remaining three major tunnel drop shafts was completed. Shaft excavation to tunnel depth was completed for the Alder, Steel, and River Street Shafts. Shaft excavation was completed at the Port Center, Taggart and McLoughlin Shaft sites. Structural concrete work began at the Port Center and Taggart Shafts. Construction of the final structural concrete lining continued at the Alder and Steel Bridge Shafts.

Consolidation Pipelines and Diversion Structures:

Outfall 28 (Insley): Completed construction of the diversion structure until the final connection to the tunnel system is made in 2011.

Outfall 30 (Taggart): No work this period.

Outfalls 33, 34, and 35 (Alder): No work for this period. Outfall 36 (Alder): The excavation and installation of temporary support for the diversion structure was completed. The diversion structure "build-out" is complete until the final connection is made to the tunnel system in 2011.

Outfalls 37 (Stark) and 38 (Oak): Completed the build-out of the Outfall 37 drop structure (located in SE 3rd Avenue and connects to Alder Shaft) and Manhole 38-1 (connects Oak outfall 38 to the consolidation conduit in SE 3rd Ave.) Completed construction of drop structure 37-2 (located on SE 3rd Avenue near Washington) and an associated 84-inch gravity sewer that will direct flows from OF 37 to the Alder Shaft. Construction of the diversion structure at OF37 will begin next reporting period.

Outfall 40: No work this reporting period.

Outfall 41: Construction of the manhole structure to connect OF41 to the tunnel system began.

Outfall 43: The temporary excavation support for the diversion structure was completed.

Outfall 44A: The micro tunneled pipeline from OF44A to the River Shaft was completed. The manhole OF44A manhole structure is constructed. The support of excavation is installed for the diversion structure that will connect the existing outfall to the new OF 44A pipeline.

Outfall 46 The diversion structure work is complete until the final connection to the tunnel system is made in 2011.

Swan Island CSO Pump Station

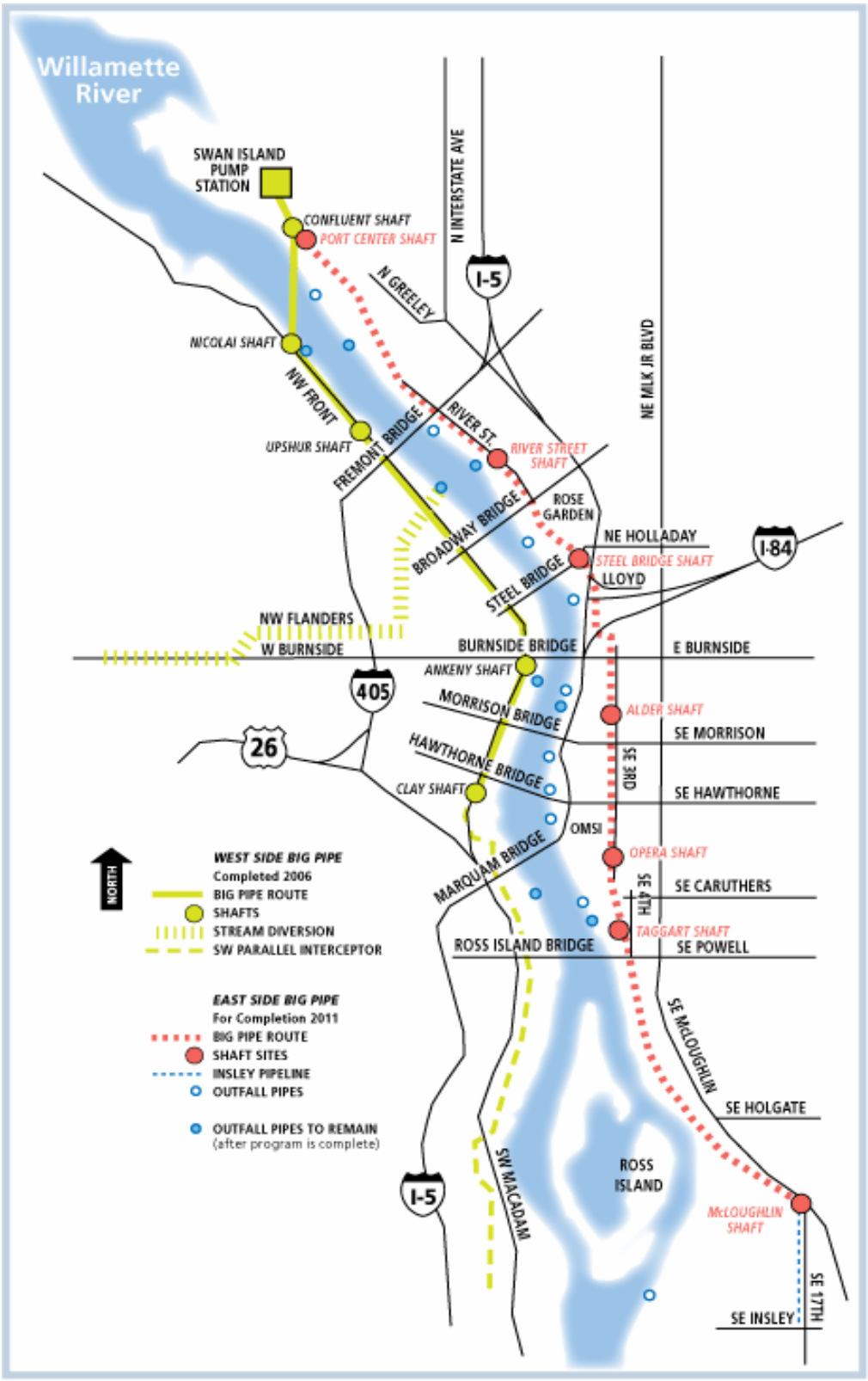
Located on Swan Island at the downstream end of the tunnel is a 220 Million Gallon per Day (MGD) dry-pit submersible pump station that transfers flow from the tunnel through a new force main system to the existing interceptors - Peninsular Tunnel and Portsmouth Tunnel. The pump station is designed to 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.

The structural components of the pump station are all complete including the surface structures, dual-power stations, and Operations & Maintenance Building. The first phase of the pump station – a 100 MGD system – is completed and in full operation. Startup testing was completed in the fall of 2006 for the multiple modes and conditions expected.

The Phase II portion of the pump station will consist of providing another 120 MGD of pumping. These pumps will typically discharge to the Portsmouth Force main and will become the primary wet weather pumping system.

During fiscal year 2008-09 the project team completed:

- 100% Design documents for the Phase 2 mechanical and electrical work.
- Advertised the project for construction in June 2009.



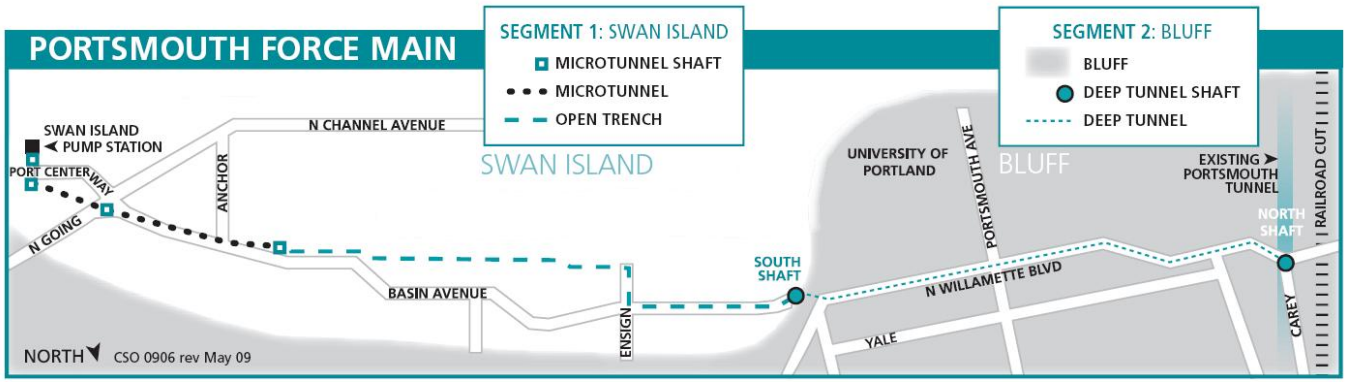
Map of Willamette CSO Tunnel System Route and Drop Shafts

Portsmouth Force Main

The Portsmouth Force Main will connect the Swan Island Pump Station to the Portsmouth Tunnel interceptor 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.

The final design scope of work includes a single 66-inch force main from the Swan Island CSO Pump Station to the Portsmouth Tunnel. For narrative purposes, the force main alignment has been broken into two distinct segments:

- Segment 1: Swan Island
  - 2,900 feet of 84-inch micro-tunnel construction
  - 6,977 feet of 66-inch open cut construction
- Segment 2: Bluff
  - 160 feet of 66-inch open-cut construction
  - 5,959 feet of 11-foot diameter deep tunnel



During fiscal year 2008-09, the project team completed:

- 100 % Design documents
- Issued Notice to Proceed for Segment 2 on April 21, 2009. Received submittals for review to begin project work.
- Issued Notice to Proceed for Segment 1 on June 11, 2009. Received submittals for review to begin project work.

Sellwood / Lents Projects

The Sellwood and Lents outfalls (OF26 and OF27) are south of the furthest reach of the East Side CSO Tunnel and will not directly benefit from that Big Pipe Project. Therefore, local solutions have been and will be implemented in the Sellwood and Lents basins to control CSO to the required ASFO level. There are three projects remaining to control CSO in this area by December 2011:

Sellwood Reliever

This project will provide a new reliever sewer in the center of Sellwood basin and is one of the projects required to eliminate CSOs to the Sellwood portion of Outfall #27 in accordance with the ASFO. This project was originally defined in the Sellwood Cornerstone Project.

The scope of work includes constructing a new 24"-36" diameter combined sewer pipeline along 11th Ave and Umatilla Street and eliminating two diversion structures.

Construction began in November 2007 and was completed in the fall of 2008. Two in-system diversions have been removed; one located at SE 11th & SE Nehalem St., and a second located at SE 15th & SE Tenino St.

Sellwood Interceptor

This project involves re-aligning and upsizing the existing Sellwood gravity interceptor sewer that conveys combined sewage from the Sellwood basin to the Umatilla Pump Station.

The interceptor runs along a north-south orientation beginning north of the Umatilla Pump Station approximately 500' to manhole SE-199 and stretches to the south approximately 1400' to manhole SE-193. It parallels the Oregon Pacific Railroad along the east bank of the Willamette.

The current interceptor is in fair to poor condition. During storm events, it overflows to the river via Outfall #27 and #26. The interceptor's present location poses a significant access problem for maintenance crews due to limited access along the railroad and steep slopes to the west. The new location therefore requires re-alignment of the railroad.

Related projects include the Lents Trunk Outfall #27 Control System and the Bureau of Parks and Recreation "Springwater Missing Gap" Project.

Accomplishments in FY08-09 include completion of design documents for construction of the Sellwood Interceptor. The design of the Interceptor is associated with the reconstruction of the existing Umatilla Pump Station located at 600 SE Umatilla Street in Sellwood. Capacity of the future Umatilla Pump Station will not increase because the new Sellwood CSO Storage & Pumping system will capture and pump the excess wet weather flows. Six existing overflow diversion structures along the Sellwood Interceptor were removed as part of the final design. These included:

- SE199 (SE Tenino and SE Grand Ave)
- SE198 (SE Umatilla and Grand Ave)
- SE185 (SE Harney and Grand Ave)
- SE187 (SE Sherrett and Grand Ave)
- SE189 (SE Clatsop and Grand Ave)
- SE192 (SE Marion and Grand Ave)
- SE193 (SE Linn and Grand Ave)

Low "dry weather" flow along the future interceptor was designed to be controlled by the reconstructed Umatilla Pump Station. Permanent CSO capture from the Interceptor sewer (and thereby Umatilla PS) will be provided via an overflow structure to the future Sellwood CSO Pump Station. When that is complete, the emergency relief for the existing Umatilla Pump Station (to OF27) known as will be abandoned as part of the work.

Sellwood CSO Pump Station / Lents Trunk Outfall #27 Control System

BES engineering staff developed a cost-effective and innovative way to control CSO discharges to Outfall 27 in the Sellwood area by converting the old 71" tall by 56"wide Lents Trunk into an inline storage and designed the Sellwood CSO Pump Station to dewater it. This project will replace more expensive wet weather upgrades at Umatilla and Harney pump stations and eliminate the need to construct a large inline storage facility in the Lents basin. The project includes lining the 4,400 feet of the Lents Trunk, installing a CSO pump station and control weir, and installing bars screens for potential floatables control.

At the end of the fiscal year, the project team had completed 60% design for the pump station and trunk lining.

Columbia Slough CSO Program

Since the completion of the Columbia Slough CSO facilities, the primary work performed on the facilities has consisted of operation, maintenance and monitoring. The large Columbia Slough Consolidation Conduit (CSCC) and the related pumping and conveyance system have performed well. Other than the December 28, 2005 accidental overflow previously reported to DEQ, there has not been an overflow from the CSCC system since it began operation in October 2000.

D. CSO Operation and Maintenance Activities Completed

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. Actual measurements and recorded data were not available for this report, so the following information represents estimates based on previous levels of activity:

- **Sewer cleaning**
  - Combination Sewers 76 miles
  - Sanitary Only Sewers 67 miles
  - Total 143 miles

- **CCTV Inspection**
  - Combination Sewers 100 miles
  - Sanitary Only Sewers 70 miles
  - Total 170 miles

- **Root Treatment** *(sometimes included in cleaning numbers)*
  - Combination Sewers 30 miles
  - Sanitary Only Sewers 5 miles
  - Total 35 miles

- **Catch Basin / Inlet Cleaning**: 14,835 units
- **Drainage Sump/Sedimentation Manhole Cleaning**: 1,938 units
- **Street Sweeping (City-wide):**
  - Residential Streets: 12,400 Curb miles
  - Arterial Streets: 15,390 Curb miles
  - Downtown Core: 7,580 Curb miles

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 100) is inspected once a week. Diversions that overflow to a downstream facility (approximately 50) 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 5,000 diversion inspections last fiscal year.

E. Public Involvement, Education and Outreach Activities:

The focus of CSO public involvement, education and outreach in FY 2008-2009 was on construction of East Side CSO projects, and design and construction of the Balch Consolidation Conduit, Sellwood sewer projects, and Oak Basin sewer improvements. The goals listed below are met through the public information and involvement activities:

Goal 1: Inform and involve businesses and residents

Goal 2: Maintain good working relationships and two-way communication with the businesses and residents along the project alignment

Goal 3: Quickly respond to individual citizen or business concerns

Goal 4: Meet project milestones and deadlines

Goal 5: Help project stay on time and within budget

Outreach activities for CSO projects provide the latest project information to the public, and include working with businesses along tunnel and pipeline routes to minimize construction disruptions. Outreach provides businesses, residents, and business 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 area communities and are designed to reduce construction impacts. Door-to-door site visits were an invaluable tool to develop the long-term relationships needed CSO construction. In addition to involving impacted communities in CSO project decisions, the bureau is committed to educating the public about environmental issues.

Environmental Services has implemented a public involvement plan for the East Side CSO projects. The projects include:

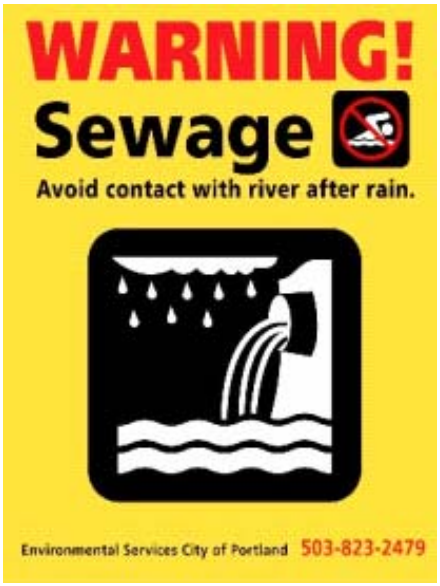
- The East Side CSO Tunnel (East Side Big Pipe)
- Construction of seven tunnel shafts
- SE 3rd Avenue sewer and outfall structure construction
- SE 2nd Avenue sewer and outfall structure construction
- SE 18th Avenue sewer and outfall structure construction
- N River Street utility relocation, and sewer and outfall structure construction
- Portsmouth Force Main

Community Benefit Opportunity Program

This program was created to add amenities to neighborhoods affected by CSO construction. East Side CSO construction affects 11 neighborhoods between SE 17th and McLoughlin and the Columbia Boulevard Wastewater Treatment Plant. Community groups and citizens in those areas nominated projects in 2007. A citizen advisory committee reviewed the proposals and worked with Environmental Services to recommend 21 projects for funding, for a total of $1.77 million. The funded projects include bank restoration along the Willamette River, street tree planting, sustainable stormwater management facilities, trail access, and community gardens. Six of the 21 projects have been completed and several more are near completion. The remainder of the $2 million dollar budget was set aside for projects that may arise throughout the life of the East Side CSO Projects. Environmental Services awarded $192,000 to the Swan Island Transportation Management Association, an area heavily affected by construction of several CSO projects, to help complete the lower trail portion of the Waud Bluff Trail.

CSO Notification

Environmental Services' River Alert system notifies the public of CSO events.



Willamette River
CSO warning sign

Columbia Slough
extreme rain event warning sign

The BES Spill Prevention/Citizen Response Section is on call to respond to a CSO discharge to the Columbia Slough by posting portable Extreme Rain Event signs. They will post the warning signs at potentially impacted recreational access points along the Columbia Slough between NE 13th Avenue and Kelley Point Park. The Columbia Slough extreme rain event warning signs display the phone number of the Spill Prevention/Citizen Response Section. Staff monitors the line 24 hours a day. There have been no combined sewer overflows to the Columbia Slough since Environmental Services developed this warning system.

The River Alert system also includes ten permanent, folding signs installed at public access points to the Willamette River. A contractor travels the river by boat and opens the warning signs each time there is a CSO between May 15 and October 15. Forty-eight hours after each CSO event ends, the contractor closes the warning signs. The contractor is required to supply BES with written reports that verify that the signs were opened or closed and when the work was completed. In the rainy season between October 15 and May 15, the signs remain open with the warning message in view for boaters and other river users. The Willamette River warning signs display the phone number of the River Alert Hotline, a 24-hour recorded message the public can call to learn if a CSO advisory is in effect and to hear a message about the CSO program.

The River Alert program notifies the media by fax and email every time there is an overflow to the Willamette River between May 15 and October 15. The Oregonian newspaper publishes an overflow icon on the top of the weather page when overflows occur. In addition, Internet users can go to www.portlandonline.com/bes/overflow to learn if a CSO advisory is in effect. Internet users can also subscribe to automatic email notification each time Environmental Services issues a CSO advisory.

Clean River Projects Construction Signs

Environmental Services requires contractors to post signage at any sewer system-related construction site to inform the public that the construction is a sewer project designed to keep rivers and streams clean. In addition, BES posted large banners at East Side CSO, and Portsmouth Force Main project construction sites.

CSO Construction Sign

CSO Interpretive Signs

Environmental Services interpretive signs are posted at CSO construction sites and along the Eastbank Esplanade. Modified interpretive signs are at two locations along the Portsmouth Force Main alignment. The signs have updated information about CSO tunnel construction.

Interpretive Sign

Media Relations

Environmental Services issues media advisories, news releases, traffic advisories, and media events to publicize CSO projects. Environmental Services also briefs reporters individually. The city provides timely, accurate responses to all media requests and keeps files of all newsprint and broadcast media coverage.

In fiscal year 2008-2009, Environmental Services issued the following 18 media releases related to CSO projects:

- 13 CSO advisories during the summer notification period
- 7 traffic advisories related to CSO construction or stories about the CSO construction program

Media Events

On November 17, 2008, Environmental Services hosted a tour of the East Side Big Project for stakeholders, reporters and invited guests to publicize significant milestones in the CSO Program.

Internet

Environmental Services provides current information about the city's CSO programs at its CSO website, www.cleanriverworks.com. The site is dedicated entirely to CSO construction projects, schedules, and impacts. The Bureau of Environmental Services website is www.portlandonline.com/bes.

V. Planned Efforts for Current Fiscal Year

Fiscal Year 2009-2010 activities will further implement the 20-year program to plan, design, construct, and operate Portland's CSO control system. The activities during this fiscal year can be briefly summarized as follows:

- Complete tunneling north to the Port Center Shaft. Remove machine and re-set into the Opera Mining Shaft and tunnel south to McLoughlin (Insley) Shaft.
- Continue completing the construction of shafts for the East Side Willamette CSO Tunnel System. Shafts cannot be fully completed until the tunnel has passed through the shafts, and then the final stages of the shaft can be constructed.
- Update the CSO System Operating Plan as the City continues operating, maintaining and monitoring the West Side Willamette and the Columbia Slough CSO Systems to assure compliance with the ASFO and the NPDES Permit
- Continue implementation of stormwater inflow reduction projects in the form of the Expanded Downspout Disconnection Program and the Sustainable Stormwater Management Program.

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

A. ASFO Milestones to be Achieved

In fiscal year 2010, BES will address one ASFO milestones:

- Submit 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 as the City develops two planning documents for CSO system:

- CSO System Operating – Update in 2010
- CBWTP Facilities Plan Update - 2009

In addition, the new Systems Planning effort will continue the process of examining the capacity and rehabilitation needs in the combined and sanitary systems. The end result will be a public facilities plan with recommended projects to address basement backups, SSOs and potential structural condition problems. BES expects to complete the combined and sanitary system plans near the end of calendar year 2009.

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 08-09, the **Expanded Downspout Disconnection Program** will continue to disconnect downspouts at homes as well as small multifamily properties in the East Willamette watershed served by the combined sewer.
- **Innovative Wet Weather Program**: At least two projects are planned for completion by the end of Summer 2009. One green street project on NW 35th in an industrial area, and one ecoroof project still in development.
- **Holladay, Stark, and Sullivan Inflow Controls Project**: BES will select final alternatives and initiate design phase activities for five additional projects in FY08-09.
- **Sustainable Stormwater Management Program**: Four green streets from the Community Request Program are planned along four projects involving pedestrian safety improvements combined with stormwater management funded by the 1% for Green Program.

- **Balch Consolidation Conduit (BCC):** The BCC project began construction in June 2009 and will continue throughout this next fiscal year. Construction is expected to be completed December 2010.
- **East Side CSO Tunnel Projects**
  - **Tunnel:** The TBM will continue to drive north towards the Port Center Way Shaft. Based on a current TBM production rates, the TBM should arrive at the Port Center Shaft in the fall of 2009. The tunnel should begin the South Drive in January 2010.
  - **Tunnel Shafts:** Installation of the final structural concrete will continue at the Alder, Steel Bridge, River Street, Port Center, and Taggart Shafts structural concrete work will begin at the McLoughlin Shaft.
  - **Consolidation Pipelines and Diversion Structures:** Work will continue at the diversion structures under construction. Initial excavation and temporary support will begin at Outfall 30. Excavation and diversion structure build out will begin for OF37 and OF43.
- **Swan Island CSO Pump Station:** The Phase 2 electrical and mechanical construction work will begin Fall 2009.
- **Portsmouth Force Main:** Construction will continue on both Segment 1 and Segment 2.

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: 140 miles
- Sewer Inspection: 160 miles
- Catch Basin/inlet Cleaning: 13,000 catch basin/inlets
- Drainage Sump Cleaning: 2,000 sumps/sedimentation manholes
- Street Sweeping:
  - Residential Streets: 12,000 Curb miles
  - Arterial Streets: 15,000 Curb miles
  - Downtown Core: 7,500 Curb miles
- Diversion Structure Inspections: Perform weekly inspections on all active diversion structures that directly overflow to the receiving stream and do not have automatic monitors/alarms; perform routine inspections on all other active diversions on a bi-monthly (once per two months) basis or as needed for maintenance and proper performance

E. FY 09-10 Public Involvement Activities Planned:

Environmental Services will continue to educate and identify opportunities for Portland residents, businesses and neighborhood groups to participate in CSO and watershed enhancement projects. The bureau will work closely with Neighborhood Coalition offices and associations to raise awareness of the CSO program, gain active public input on project decisions, and involve more citizens, businesses and neighborhood groups in watershed protection and restoration efforts. Activities in the coming year include:

- Working with citizen committees and work groups to address issues regarding CSO project construction plans and construction mitigation measures. This will include continued community involvement and outreach for the Portsmouth Force Main construction now underway.
- Continuing to conduct site visits to areas within the East Side CSO Tunnel alignment and the Portsmouth Force Main Project.
- Continuing to give presentations to organized community groups and trade groups.
- Providing opportunities for face-to-face discussions, such as open houses. This will include two open houses during the design of the Portsmouth Force Main Odor Control Facility.
- Developing informational materials that explain CSO projects, timelines, construction mitigation plans and opportunities to enhance impacted communities.
- Providing public involvement support for Willamette Stormwater Inflow Control Projects to encourage and assist commercial and industrial property owners in the combined sewer area to remove stormwater from the combined system by creating on-site stormwater infiltration facilities that use more natural systems like swales, wetlands and native vegetation to detain and treat stormwater.
- Providing educational CSO classroom presentations and assembly programs, and developing a new CSO classroom activity that focuses on the history of sewers and implementation of CSO solutions in Portland,
- Providing information to the public about the CSO program through special displays in high traffic areas such as OMSI and businesses affected by construction. The CSO Exhibit at OMSI was upgraded last fiscal year to reflect new projects and to include the East Side CSO Tunnel Projects.
- Providing presentations and guided “tours to the fence” of project sites.
- Continuing the CSO River Alert public notification program.
- Distributing citywide newsletters and quarterly water/sewer utility bill inserts that inform citizens about the CSO program and projects, watershed restoration activities and how citizens help protect Portland watersheds.

VI. Conclusions

This past fiscal year, the City continued its focus on implementing the East Side CSO Program's work of tunneling from the OMSI/Opera mining shaft and constructing consolidation piping and drop shafts. Due to these efforts, the capital expenditure for the CSO Program was about $100 million this past fiscal year, and is expected to be $170 in the next fiscal year. These costs are in addition to the approximate $900 million in capital costs already expended over the past years for the Westside, Cornerstone Projects and the Columbia Slough CSO systems.

The Bureau is now beginning to plan for the projects that will need to occur after 2011 in order to maintain and increase the level of CSO control beyond the minimum requirements stated in the ASFO. The ASFO requires the City to submit an updated Facilities Plan in September 2010 to identify how the CSO system will continue to provide better-than-ASFO required levels of CSO control. These future, post-2011 projects are expected to be almost entirely "sustainable stormwater management" facilities designed to infiltrate and treat additional stormwater off of difficult impervious surfaces while providing vegetation and green spaces for habitat and public amenities. To prepare for this post-2011 effort, BES is implementing many pilot and grant projects via the Sustainable Stormwater Program to develop a full base of experience and proven performance that will serve the Bureau in achieving the post-2011 goals for continued stormwater reduction and increased CSO control.

APPENDIX A

CITY OF PORTLAND - BES

CSO Capital Improvement Program Implementation Schedule

(Appendix A contains 37 pages including this title page)