PHILADELPHIA WATER DEPARTMENT

Annual CSO Status Report

2001

Chapter 94: Wasteload Management Report

March 31st, 2002

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Section 1 - Introduction

The purpose of this report is to document the status and changes made to programs implemented by the City of Philadelphia Water Department (PWD), during calendar year 2001, to manage and reduce the combined sewer overflows (CSO's) permitted to discharge to waters of the Commonwealth of Pennsylvania. Specifically, this report is submitted pursuant to meeting the requirements of NPSDES Permits #'s 0026662, 0026671, and 0026689. Part C, Section D: Reporting Requirements, b. Annual CSO Status Report. This section requires that the permittee submit an Annual CSO Status Report as part of the Chapter 94 Municipal Wasteload Management Report.

The report is organized as follows: Section 2 Citywide Programs discusses the operational status of the combined sewer system and includes summaries of the frequency and volume of overflows for the past calendar year. Improvement projects as they relate to the continued proper operation of combined sewage infrastructure as required by the United States Environmental Protection Agencies (US EPA's) Nine Minimum Controls (NMC's) and as described in the Phase I section of the Long Term CSO Control Plan (LTCP) approved September 18, 1997. Sections 3 through 7 describe the status of the watershed management planning and capital project implementation occurring within each respective CSO watershed. Post Construction Monitoring of CSO discharges and other performance-related information for each CSO system is summarized by watershed. Section 8 provides the status of activities completed to advance the concept of the Watershed Technology Center as described in the CSO LTCP.

Section 2 - Citywide Programs

1.0 Phase I – Continued Implementation of the Nine Minimum Controls

In the first phase of the PWD's CSO strategy, and in accordance with its NPDES permits, the PWD submitted to the Pennsylvania Department of Environmental Protection on September 27, 1995, *CSO Documentation: Implementation of Nine Minimum Controls*. The nine minimum controls are low-cost actions or measures that can reduce CSO discharges and their effect on receiving waters, do not require significant engineering studies or major construction, and can be implemented in a relatively short time frame. In general, PWD's NMC program includes comprehensive, aggressive measures to maximize water quality improvements through the following measures:

1. Review and improvement of on-going operation and maintenance programs
2. Measures to maximize the use of the collection system for storage
3. Review and modification of PWD's industrial pretreatment program
4. Measures to maximize flow to the wastewater treatment facilities
5. Measures to detect and eliminate dry weather overflows
6. Control of the discharge of solid and floatable materials
7. Implementation of programs to prevent generation and discharge of pollutants at the source
8. Measures to ensure that the public is informed about the occurrence, location and impacts of CSO's
9. Comprehensive inspection and monitoring programs to characterize and report overflows and other conditions in the combined sewer system.

Changes made to any of the specific projects or programs put into place as a result of the NMC document are discussed in below.

1.1 Operation Maintenance

Reference Philadelphia NMC Report, 9/27/95 Section 1 pp. 61-62. The operation and maintenance program is well established and any changes or modifications to existing programs are indicated in the sections below.

1.1.1 CSO Regulator Inspection & Maintenance Program

Annual summaries of the comprehensive and preventative maintenance activities completed in the combined sewer system over the past year are detailed in Appendix A and any changes are discussed below.

Customized Regulator Inspection Forms
Start: 8/1/95 End: 12/31/2000 Status: Complete

1.1.2 Pumping Station Maintenance

Annual summaries of the Wastewater Pumping summaries are included in Appendix B for:

- Flows
- Station Outages
- Station Condition
- Pump Performance
- Pump Availability

- Maintenance Breakdown

Central Schuylkill Pumping Station (CSPS) Quarterly Grit Pocket Cleanings -
Start: 8/1/95 End: Status: Ongoing
Grit removal operations are performed at the Central Schuylkill Pumping on a periodic basis to maintain the capacity of the siphon. In calendar year 2001, 11 cubic yards of debris was removed from the two grit pockets.

WW Pumping Predictive Maintenance Program
Start: 8/1/1995 End: Status: Ongoing

Pump Station Emergency Backup Power
Start: 9/27/1995 End: 12/1/1999 Status: Complete
See pump station maintenance annual summaries in Appendix B for documentation of any pump station outages.

1.1.2 Sewer Cleaning Contracts
Start: 12/1/1995 End: Status: Complete

1.1.3 Inflow Prevention Program
Start: 8/1/1995 End: 6/4/1999 Status: Complete

Tide Gate Inspection and Maintenance Program
Summaries of the tide gate inspection and maintenance completed during calendar 2000 are found in Appendix A, which documents the locations where preventative maintenance was performed on the tide gates.

Emergency Overflow Weir Modification
Start: 11/7/1994 End: 6/4/1999 Status: Complete

1.2 Maximize In-System Storage

Reference Philadelphia NMC Report, 9/27/95 Section 2 pp. 1-15

An effective control for providing in-system storage is to raise the overflow elevation by physically modifying the overflow structure. However, this approach must be implemented cautiously, since raising the overflow elevation also raises the hydraulic grade line in the combined sewer during storm flows, and therefore can increase the risk of basement and other structural flooding within the upstream sewer system.

Adding a diversion dam was proposed as a means to increase the hydraulic capacity of slot regulators that presently do not have a diversion dam. The flow maximization plan detailed in NMC #4 included the addition of dams at these locations. The NMC report recommended 57 locations for the addition of a diversion dam; 40 locations in the SWDD, 15 locations in the NEDD and 2 locations in the SEDD. As a means to increase both the hydraulic capacity of the regulators and the available in-system storage, it was deemed feasible to raise the overflow weir elevation at these selected regulator locations. Additionally, an analysis was completed to determine the opportunity for implementing Real Time Control (RTC) of CSO discharges.

1.2.1 Evaluate Real Time Control in LTCP
Start: 2/1/1996 End: 1/27/1997 Status: Complete

See section 2 City Wide Programs

1.2.2 Install Diversion Dams
Start: 8/1/1995 End: 6/30/1997 Status: Complete

1.3 Modify Pretreatment Program

Reference Philadelphia NMC Report, 9/27/95 Section 3 pp. 1-13

1.3.1 Phase I Implementation
Start: 8/1/1995 End: 2/1/1997 Status: Complete

Inventory Significant Non-Domestic
Start: 8/1/1995 End: 8/21/1995 Status: Complete

Guidance Memorandum
Start: 8/1/1995 End: 1/26/1996 Status: Complete

Develop Data Form for Annual Inspections
Start: 3/1/1996 End: 9/1/1997 Status: Complete

Pretreatment Inspections - 1st 50%
Start: 3/1/1996 End: 7/1/1996 Status: Complete

Asses SIU Wet Weather Monitoring
Start: 7/1/1996 End: 8/1/1997 Status: Complete

1st 50% of SIU's Reduce Discharge
Start: 10/1/1996 End: 1/1/1997 Status: Complete

Pretreatment Inspections - 2nd 50%
Start: 7/1/1996 End: 12/31/1996 Status: Complete

2nd 50% SIU's Reduce Discharge
Start: 1/1/1997 End: 12/31/1998 Status: Complete

1.3.2 Phase II Implementation
Start: 3/1/1997 End: Status: Ongoing

Report - Performance of Phase I Activities
Start: 3/1/1997 End: 3/31/1997 Status: Complete

Annual Pretreatment Inspections - Criteria
Start: 3/18/1997 End: Status: Ongoing

Inspections are now being conducted using guidance criteria on evaluating wet weather pollution prevention efforts for those industries that may have batch operations within a continuous discharge. For the upcoming calendar year, the Department's Industrial Waste Unit will be examining dry weather flow data collected from the trunk sewer at each CSO structure. The CSO's were sampled in 1997 for conventional pollutants and heavy metals. While this database was created for a consultant to model an expected loading to the stream

from a particular CSO merging the data with Storet values for stormwater, the data is proving useful in identifying sewersheds that have a strong IW(non-domestic)character. With this as a screening basis IWU is will continue to investigate further up the trunk sewer to find the sources of the high strength wastes and then evaluate in detail the nature and timing of these particular discharges.

1.4 Maximize WPCP Flow

Reference Philadelphia NMC Report, 9/27/95 Section 4 pp. 28-42

The basic strategy of flow maximization, or Modified Regulator Plan (MRP) was to deliver more flow to the WPCPs more frequently, to enable greater pollutant removals. The results of the hydraulic modeling of the interceptor sewers under the flow maximization scenarios indicate that significantly higher rates of flow can be delivered to the WPCPs more frequently than under current conditions. To date, 100% of the projected flow increase associated with the Modified Regulator Plan has been implemented. Some additional modifications might be made in the future to prioritize certain overflows, or to reflect an improved understanding of the collection system dynamics as identified throughout the ongoing modeling work, but no additional capture is expected to result on a system wide basis.

1.4.1 POTW Stress Testing
Start: 9/1/1997 End: Status: Moved to Section 2.3 per LTCP

1.4.2 Prelim Costs - NMC #4 Implementation
Start: 8/1/1995 End: 12/20/1995 Status: Complete

1.4.3 NE DD Modified Regulator Plan (MRP)
Start: 1/1/1996 End: 7/1/1998 Status: Complete

1.4.4 SW DD Modified Regulator Plan (MRP)
Start: 1/1/1996 End: 7/1/1998 Status: Complete

1.4.5 SE DD Modified Regulator Plan (MRP)
Start: 10/30/1995 End: 7/1/1998 Status: Complete

1.4.6 NMC 4 Implementation Costs (LTCP)
Start: 5/1/1996 End: 9/1/1996 Status: Complete

1.5 Eliminate Dry Weather Overflow (DWO)

Reference Philadelphia NMC Report, 9/27/95 Section 5 pp. 1-5

Dry weather discharges at CSO outfalls can occur in any combined sewer system on either a chronic (i.e., regular or even frequent) basis or on a random basis (i.e., as a result of unusual conditions, or equipment malfunction). Random dry weather discharges can occur at virtually any CSO outfall following sudden clogging by unusual debris in the sewer, structural failure of the regulator, or hydraulic overloading by an unusual discharge of flow by a combined sewer system user. Chronic dry weather discharges can and should be prevented from occurring at all CSO outfalls. Random discharges cannot be prevented, but they can and must be promptly eliminated by cleaning repair, and/or identification and elimination of any excessive flow and/or debris sources.

As documented in Section 1 of the NMC report, regular inspections and maintenance of the CSO regulators are performed throughout the City. These programs ensure that sediment accumulations and/or blockages are identified and corrected immediately to avoid dry weather overflows. The results of these efforts are reflected in the Department's Monthly CSO Status Report submitted to PaDEP and EPA Region III and summarized on annual basis in this report. The detailed inspection report summaries are included in Appendix A. The implementation of a comprehensive monitoring network is an ongoing project to enhance PWD's ability to ensure high levels of protection against dry weather overflow. Based upon peer review of other CSO communities the present combination of the physical inspection and maintenance with comprehensive monitoring, the present program far exceeds the level of effort employed in other communities.

1.5.1 CSO Monitoring Network

Start: 8/1/1995 End: 12/31/2002 Status: In-Progress

The CSO monitoring network remains in the construction and site acceptance testing phase. A site specific status report is provided in Table 1.5.1 for the each of the major site types in the contract including:

- CSO's
- Township Metering Stations
- Pump Stations
- Hydraulic Control Points (Miscellaneous points of interest)
- Rain Gages

The following descriptors are provided to indicate the status of the major phases of acceptance testing of site components. Since phone and electric service are required in order to make a site operational, utility availability in remote areas has significantly impacted the implementation schedule. The acceptance testing is a 3 part process designed to ensure short and long term reliability along with assurance that the individual sites will work within the entire system. Please refer to the enclosed table for site-specific information on the construction status of each remote site.

Peco Service -	Electric service operational.
Bell Service -	Phone service operational.
One-Day Test (P/F) –	Current Status (Pass / Fail) of one-day site acceptance testing
One-Day Test Date -	Date on which the one-day test was performed
7-Day Test (P/F)-	Current Status (Pass / Fail) of 7-day site acceptance testing
7-Day Test Date -	Date on which the 7-day test was performed
Site Acceptance Date-	Date on which the entire site was accepted

The computer system currently collects data from approximately 153 sites throughout Philadelphia and the surrounding areas. Currently 189 sites have been accepted, although a few sites remain without power or phone service. The Fox St. weather station was installed in March of 2001 and collects data on a constant basis. In November of 2001, a new server was installed which provides faster data retrieval and the finalization of the 400 page computer system design document and the acceptance by PWD of that document to facilitate the final development of the monitoring network computer system was also completed. Updated software for the system is in the debugging stage, with fixes applied on an as needed basis. Graphs for operating sites can now be displayed and printed. Reports are in the final stage of development where data is verified on a regular basis. These reports are expected to be completed and accepted in CY2002. Accepted sites are regularly monitored and reconfigured for consistent data collection. The data remains provisional until the computer system is fully implemented and accepted.

The implementation of the CSO monitoring network is to include the use of an Event Notification System (ENS) to reduce the response time to abate dry weather discharges and wedged open tide gates. The redevelopment of the ENS is ongoing as the new computer system is implemented and the specifics of new sites are incorporated.

Table 1.5.1 Site Status Report for CSO Monitoring Network Implementation

Site Type	# of Sites	# with Aerial Service	# with Underground Service	% with PECO Service	% with BELL Service	# passing 1 day test	# failing 1 day test	# passing 7 day test	# failing 7 day test	# sites accepted	% of sites accepted
Cobbs Creek CSO's	34	19	8	76	94	32	2	32	0	32	94
Delaware River CSO's	47	32	11	85	85	46	1	46	0	46	98
Frankford Creek CSO's	14	11	0	7	100	4	7	4	0	4	29
Pennypack Creek CSO's	4	4	0	100	100	0	4	0	0	0	0
Schuylkill River CSO's	45	28	10	67	74	36	7	36	0	36	80
Tacony Creek CSO's	14	9	0	14	100	6	8	6	0	6	43
Hydraulic Control Points	19	6	0	55	75	9	1	9	0	9	47
Relief Structures	8	5	0	100	100	2	6	2	0	2	25
Siphons	1	1	0	0	100	1	0	1	0	1	100
Pump Stations	16	0	0	100	100	15	0	15	0	15	94
Rain Gages	23	0	0	100	96	18	3	18	0	18	78
Township Meters	23	0	0	96	96	23	0	22	0	22	96
Weather Stations	1	1	0	100	0	1	0	0	0	0	0

1.5.2 WTP Residuals Management
Start: 12/15/1994 End: 12/31/1997 Status: Complete

The Department will continue to monitor the effectiveness of the operational changes to residuals management strategies, monitor for any adverse impacts on downstream CSO's, and report any DWO's in the monthly status reports.

1.5.4 Somerset Grit Chamber Cleaning
Start: 8/1/1995 End: Status: Ongoing

p. 30 SIAC - PWD regularly monitors the sediment accumulation in the grit trap at the origin of the Somerset Intercepting Sewer and in locations downstream to determine appropriate cleaning intervals for the girt trap and downstream interceptor. Driven by the monitoring program, the grit basin is cleaned periodically and debris quantities tracked to further refine the frequency of cleaning so as to maintain adequate capacity in the Somerset Intercepting sewer.

During calendar 2001, the Somerset Grit Chamber was cleaned 4 times in 2000 on the following dates:

Date	Tons Removed
Jan. 18, 2001	Unknown
Feb 16, 2001	107 Tons
Jul. 24, 2001	59.5 Tons
Oct. 11, 2001	113.6 Tons

1.6 Solids and Floatables

Reference Philadelphia NMC Report, 9/27/95 Section 6 pp.1-12

The control of floatables and solids in CSO discharges addresses aesthetic quality concerns of the receiving waters. The ultimate goal of NMC No. 6 is, where feasible, to reduce, if not eliminate, by relatively simple means, the discharge of floatables and coarse solids from combined sewer overflows to the receiving waters. The initial phase of the NMC process has and will continue to focus on the implementation of, at a minimum, technology-based, non-capital intensive control measures.

The effectiveness of this minimum control and the evaluation of the potential need for other methods to more effectively control the discharge of solids and floatables from CSO's has been incorporated into the floatables monitoring and pilot evaluation project (T-4 Netting Facility below). That is, the need to control the discharge of solids and floatables, the degrees of control that will be necessary, and the determination of the controls that may be required, are intended to be an ongoing process throughout the development stage and the early implementation phases of the Long Term Control Plan.

1.6.1 Pilot Netting Facility
Start: 3/1/1996 End: 4/1/1997 Status: Complete

A pilot, in-line, floatables netting chamber was constructed as part of a sewer reconstruction project at CSO T-4 Rising Sun Ave. E. of Tacony Creek. The construction of the chamber was completed in March of 1997

and the netting system continues to operate. The quantity of material collected is weighed with each net change.

Since the installation of the netting device, 68 nets have been replaced (34 visits) with an approximate total of 4905 pounds of debris captured. The City has compared the floatables removed from the net with other floatables control technologies employed. More specifically, on an area weighted basis the inlet cleaning program data suggests that street surface litter dominates the volume of material that can enter the sewer system. The pilot in-line netting system installed at T_4 has been shown to capture debris on the same order as the WPCP influent screens indicating that effective floatables control needs to target street surface litter in order to effectively reduce the quantity of debris likely to cause aesthetic concerns in receiving streams.

1.6.2 Repair, Rehabilitation, and Expansion of Outfall Debris Grills

Start: 9/27/95 End: Status: Ongoing

Debris grills are maintained regularly at sites where the tide introduces large floating debris into the outfall conduit. This debris can then become lodged in a tide gate thus causing inflow to occur. Additionally, these debris grills provide entry restriction, and some degree of floatables control.

Repair, Rehabilitation, and / or expansion of debris grills was performed at the following sites during calendar year 2000:

- D-45 CSO Outfall: A 20ft x 20ft multi-section debris grill was fabricated. It is scheduled to be installed this spring

- Sandy Run Outfall: Repair and modify debris grill to prevent unauthorized entry. This site was vandalized several times in 2001 and needed extensive modification.

1.7 Pollution Prevention

Most of the city ordinances related to this minimum control are housekeeping practices that help to prohibit litter and debris from actually being deposited on the streets and within the watershed area. These include litter ordinances, hazardous waste collection, illegal dumping policies and enforcement, bulk refuse disposal practices, and recycling programs. If these pollutant parameters eventually accumulate within the watershed, practices such as street sweeping and regular maintenance of catch basins can help to reduce the amount of pollutants entering the combined system and ultimately, the receiving water. Examples of these programs are ongoing and were presented in the NMC document. The City will continue to provide public information about the litter and stormwater inlets as part of its implementing this minimum control as well as continue to develop the following new programs.

1.7.1 Billstuffers

Billstuffers are regularly produced by the Water Department as an educational tool for disseminating information pertaining to customer service and environmental issues. Specific billstuffers are designed on an annual basis for the CSO, Stormwater and Watershed Management programs to address the associated educational issues. These billstuffers reach over 500,000 water and wastewater customers. The environmental bill stuffers distributed in 2001 included:

- Recycling Your Christmas Tree
- Grasscycling – Recycling Your Grass Clippings
- Streets Department Curbside Recycling Program
- Every Drop of Water Comes from Our Watersheds (watersheds and CSOs)
- In's & Out's of Sewer Inlets
- PWD's Travel Through Time Tours (public tours through PWD facilities)
- Yo! No Dumping! Drains to River (Inlet Stenciling Program)
- You Too Can be a Great Gardener – Practicing Conservation Landscaping

1.7.2 Waterwheel Watershed Newsletters

The Water Department's watershed newsletters are usually published on a bi-annual basis and target specific information to the residents living within a particular watershed. In this manner, citizens can be kept informed of departmental water pollution control initiatives specific to the watershed they live in.

Spring/Summer '01 Edition – This issue focused on gardening practices, specifically providing various tips on how to ensure stormwater runoff from gardens is free from toxic chemicals from fertilizers and how to create a healthy garden. Tips included: testing soils and recycling nutrients, reducing impermeable surfaces, using native plant, creating habitats, conserving water and top dressing for success. Information was provided about the PWD's top quality EarthMate product and where to obtain it.

Fall '01 Edition – This issue featured the projects of the PWD sponsored Tookany/Tacony-Frankford Watershed Partnership and highlighted the goals for the upcoming Tacony-Frankford River Conservation Plan, partially funded via a grant from the PA Department of Conservation and Natural Resources. The newsletters was geared to alert the public of the opportunity to participate in the creation of a comprehensive plan that takes into account waterways and their surrounding lands. General watershed information was also provided.

1.7.3 Comprehensive Education Materials

The following projects were initiated and/or completed in calendar year 2001:

- Development of a watershed-based environmental curriculum with a special emphasis on Mill Creek.
- Watershed educational partnerships (continued from 1999) with Bodine High School, Edison-Faira High School, Fairmount Park, Phila. Recreation Dept., Academy of Natural Sciences, Lincoln High School, Turner Middle School, and the Schuylkill Center for Environmental Education.
- Development (continuing) of watershed self-guided tour booklets for the city's eight watersheds
- Final designs for watershed exhibits to be installed at the Fairmount Water Works Interpretive Center, slated to open in Fall 2002. Construction of the FWWIC, partially funded by a DCNR grant, began in late 2001.
- Research/development of the Technical Memos for water quality assessments (chemical, biological, physical) for the Tookany/Tacony-Frankford Watershed Partnership, facilitated by the Water Department and its consultant, the Pennsylvania Environmental Council.
- Recruitment of steering committee members for the Tacony-Frankford River Conservation Plan.
- Submittal to DCNR for a River Conservation Plan grant for the Pennypack Creek watershed for Philadelphia and Montgomery counties.
- The development and publication of a watershed survey for the Darby-Cobbs watershed.

- The development of a website (www.phillywater.org/Partnerships) for the Tookany/Tacony-Frankford Watershed Partnership.

General Educational projects in calendar year 2001 - A great variety of public information materials concerning the CSO LTCP in relation to the watershed framework were developed as a result of the watershed partnerships, including: fact sheets, press releases, tabletop exhibits, brochures, watershed surveys, websites, watershed walks, and presentation materials.

1.7.4 Citizen Advisory Committee (CAC)

The Water Department's consultant, the Partnership for the Delaware Estuary Program, facilitates the CAC advisory committee meetings and the project specific team meetings (in 2001 the Stormwater CAC merged with the PWD's Drinking Water Quality CAC). The CAC is comprised of the following members:

- Frankford United Neighbors
- Schuylkill River Development Corp.
- Friends of the Wissahickon
- Philadelphia Canoe Club
- Collaborations, Inc.
- Phila. More Beautiful Committee
- Bridesburg Civic Association
- Friends of the Manayunk Canal
- Fairmount Rowing Association
- Friends of the Poquessing Creek
- Fairmount Water Works Interpretive Center
- School District of Philadelphia
- Delaware Estuary Program
- PA Horticultural Society
- Friends of Tacony Creek Park
- Greenspace Alliance
- PhilaPride
- Wawa Inc.
- Delaware Valley Regional Planning Commission
- AAA Mid-Atlantic
- Academy of Natural Sciences
- Friends of Pennypack Creek
- Riverkeeper Network
- Clean Water Action
- Turner Construction
- PA Gasoline Retailers & Allied Trades
- Greater Phila. Chamber of Commerce
- TruGreen-Chemlawn
- Riverway Environmental Education Association
- Cobbs Creek Community Environmental Education Center
- Public Works Studio
- Manayunk Development Corp.

The following projects were completed or initiated by the Water Department and/or its CAC in 2001:

PARTNERSHIPS and EDUCATIONAL PROGRAMS

From the moment the City of Philadelphia began providing water to its citizens there has been a need to create partnerships to protect the water supply. In our earliest days it was through the creation of Fairmount Park. Today we comply with state and federal regulations that require citizen participation. More importantly however, the Philadelphia Water Department through its Public Education Unit has for more than 16 years voluntarily reached the public through an aggressive education and community outreach program that serves as a model for utilities across the country. Through these programs, the Water Department raises public awareness and understanding of storm water problems and issues. Educational materials are distributed at these events and included in bill stuffers to over 460,000 households. In addition, the City continues to facilitate watershed stakeholder meetings to unify public participation in the surrounding counties and to address the issues pertaining to stormwater management on a watershed scale.

Bio-Blitz:
One of our longest standing partnerships is with Fairmount Park who yearly holds an environmental fair in different neighborhood parks throughout the city. This year, the Cobbs Creek Community Environmental Education Center (CCCEEC) joined the Park and NLREEP in hosting Bio-Blitz in Cobbs Creek Park. Public Education staff had the opportunity to observe and talk to elementary, middle- and high-school student teams, as the teams assisted with the species count. The species collected will be used in the development of the CCCEEC's environmental education programming. Public Education is also assisting CCCEEC with the development of their summer water curriculum to include PWD water resources/stormwater issues.

PWD's aquatic biologist assisting students during Bioblitz 2001

Stormwater Citizens Advisory Council:
The Stormwater CAC promotes public participation and education in the city's stormwater management program, to achieve three specific objectives: (1) encourage changes in individual behavior to improve storm water quality, (2) develop informed citizenry to support the City's storm water management objectives, and (3) comply with the public education and involvement component of the storm water permit. The Partnership for the Delaware Estuary facilitates meetings of the CAC. The Council reviewed its original priorities list from last year to assess completion/progress on various projects, including the storm drain stenciling volunteer program and production of the "Let's Learn About Water" activity book for children. In addition, the CAC continues to distribute its award-winning video, "Stormy Weather." Based on year 2000's success with storm drain stenciling, the Partnership received a $33,000 PA Growing Greener Grant for our 2001 campaign, which will again include a drawing contest and be designed to evolve into an ongoing adopt-a-storm drain program

PWD "Clean Water for Life" Exhibit
The PWD opened an exhibit titled "Clean Water for Life" in October 2001 at the City's Municipal Services Building. The exhibit will remain on display through September 2002. The exhibit documents the PWD's technological, chemical and environmental efforts to provide the citizens of Philadelphia with clean water. In its earliest days, the department responded to the Yellow Fever epidemics of the 1790s. Although this disease

was actually carried by mosquitoes, the public believed cleaner water would prevent the disease, so the City pumped water from the Schuylkill River. One hundred years later, when faced with a series of Typhoid Fever epidemics, the department responded with a filtration system to purify the City's water.

Since the passage of the Safe Drinking Water Act over 25 years ago, Philadelphia has an unblemished record in water quality. This display not only documents the rich heritage of the Water Department, but it also provide exhibit viewers with a keen sense of the processes involved in making our water safe and clean for human consumption. The exhibit also traces the development of the City's sewer collection system and illustrates the PWD's transition from a utility that focuses on infrastructure alone to one that treats infrastructure and water quality improvements on a watershed basis.

Manayunk Dog Waste Collection Program:
The Stormwater CAC also sponsored a dog waste collection pilot project along the Manayunk Canal. Tip cards asking "What's your doggy doo doing?" were part of the May kick-off for this campaign. The PWD's Deputy Commissioner led partners including the Fairmount Park Commission, Friends of the Manayunk Canal, the Manayunk Development Corporation, and the Partnership for the Delaware Estuary in a new public outreach campaign to address this aspect of non-point source pollution. Signs and dog waste pick-up stations and bags were installed next to baskets to deposit the wastes up and down the canal.

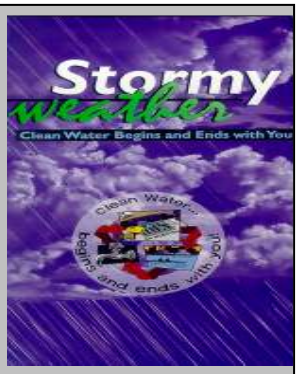
Dog Waste Clean-Up Facility Along The Manayunk Canal

Annual Earth Day Service Project:
Community and watershed volunteers participated in the Water Department and Stormwater CAC sponsored Earth Day service project by installing storm drain curb markers throughout the City. Volunteers used the newly developed curb markers developed by PWD and PA Coastal Zone Management Project to stencil the message "Yo!!! No Dumping! Drains to River!" beside a fish. By developing a more durable and easily applied curb marker, volunteers were able to cover more area during the project.

The "New" Stormwater Inlet Marker

Educational Publications:
On of the Water Department's most successful community publications is the recently released student activity book (grades 3 – 8) "Let's Learn About Water." This publication develops the concepts of definition of a watershed, impact of non-point source pollution, and personal responsibility for protecting our water supply. It is in great demand by schools, communities and government officials. This book was developed with the Partnership for the Delaware Estuary and was funded in part through DEP Coastal Zone Management funds. Future editions will include descriptions and activities for various city watersheds. The curriculum has already been used in a number of middle schools to meet state required science-based credits.

"Stormy Weather" ***Video:***
The video focuses on individual responsibility as a critical success factor in improving storm water quality. The deleterious effects of storm water pollution on the physical and biological community in aquatic systems are addressed through various anti-litter messages, such as: litter control, responsible household and pet waste management, and the proper use of inlets. The video has been distributed to over 300 environmental groups, various citizen groups, and schools, and has become a part of the environmental education curriculum for Delaware schools. The City's cable channel is showing the video twice a day.



"Stormy Weather" Video

"Clean Water Begins and Ends with You" Drawing Contest:
The Partnership for the Delaware Estuary, the PWD, and the PA Coastal Zone Management sponsored its second drawing contest for Philadelphia student's grades K-12 in January. Students were required to draw an illustration that shows how Philadelphians can help prevent stormwater runoff pollution. First prize drawings were used to promote stormwater pollution prevention messages on SEPTA buses and in the creation of a "Clean Water Begins and Ends with You" calendar. More than 450 drawings were entered into the contest from 25 public, private and parochial schools.

2001-2002 "Clean Water Begins And Ends With You" Calendar

Cobbs Creek Community Environmental Education Program:
PWD continues to work with the center in support of programs initiated by the Darby-Cobbs Watershed Partnership and stormwater pollution prevention programs sponsored by the PWD. Students participate in benthic macroinvertebrate assessment, fish collection techniques, and stream characterizations. The program, "home-based" at Turner Middle School in West Philadelphia, involves not only classroom education, but also service learning field work – stream study, trail development, butterfly garden – for Cobbs Creek and community. In addition, three students from Turner Middle School were chosen to perform a science project directed towards aquatic ecosystems and biological integrity of Cobbs Creek. Students were assisted by the Philadelphia Water Department's aquatic biologists and the students' project was then displayed at the Carver Science Fair at the Academy of Natural Sciences.

Aquatic Biologists And Students From Turner Middle School Assessing Cobbs Creek

Darby-Cobbs Watershed Partnership:
The Water Department is supporting a number of public education initiatives in development by the Public Participation committee of the Darby-Cobbs Watershed Partnership, including: 1) the production and publicizing of the Watershed Status Report, 2) the development of a teachers training workshop funded by a Growing Greener grant, in which twenty middle- and high-school teachers participated in five Saturday workshops on lessons involving: watershed management, stormwater management, water quality, and ecological restoration. The final workshop was dedicated to the design of service-learning projects and 3) the development of a resident survey on watershed awareness and pollution-causing practices.

Students And Teachers From The Philadelphia School District Learning About The Urban Water Cycle And Human Impact On The Cobbs Creek Watershed.

Tacony-Frankford Watershed Partnership:
The Water Department is supporting a number of public education initiatives suggested by the Public Participation committee of the Tacony-Frankford Watershed Partnership, formed in October 2000. projects included watershed walks in Montgomery and Philadelphia counties along the streams and their tributaries. Walks were co-hosted by resident volunteers and partners in March and April. Upcoming projects in development include a creek clean up day, The development of a newspaper series on the watershed, its history, challenges, amenities and future, and a logo design contest for watershed schools.

Environmental Protection Secretary David Hess Assisting With A Fish Assessment During The Tacony-Frankford Watershed Walk

Fairmount Water Works:
The City's Stormwater Management and Source Water Protection programs are inherently linked, as surface water is the source of the city's drinking water supply. Through programs offered at the Interpretive Center, the City provides public education about the urban water cycle and the role of environmental stewardship through tours of the department's drinking and wastewater treatment plants. Students in Philadelphia and surrounding communities learn about stormwater pollution prevention through a series of educational activities, most notably the Summer Water Camp and Urban Ecology programs. With the receipt of its second million dollar grant from The Delaware River Port Authority (DRPA), PWD was in the position to proceed with the construction planning.

Current Restoration Progress On The Fairmount Water Works' Esplanade And Gazebo

In support of the work, PWD also received a $240,000 grant from the state's Department of Conservation and Natural Resources (DCNR). Groundbreaking for the construction of the Interpretive Center took place in April and is the renovation is currently underway. The Center is scheduled to be completed by Earth Week 2002.

Members Of The Water Department Preparing For Summer Water Camp

PWD Summer Water Camp:
For more than 10 years, the Public Education Unit has offered a "water camp day" as a field trip experience for day camps throughout Philadelphia. Water themes include lessons on the urban water cycle, non-point source pollution, watershed protection, and water quality. In the summer of 1999, 2000 and again in 2001, PWD partnered with the Recreation Department to offer this opportunity to camps operated through the City's recreation centers. The month of June has been devoted to acquainting our six interns with PWD issues and culture, water resource science, and child development and management skills. During the summer of 2000, 50/ day camps participated in the PWD summer camp program. For the summer of 2001, because of the on-going construction at the Fairmount Water Works, morning activities will be held at the Belmont Plant followed by an Afternoon trip to the Southeast Plant.

Earth Force Youth Summit:
The PWD/Public Education was one of 11 community partners who took part in the program, which is an Educational "expedition" by students through Environmental displays and demonstrations. Attendance was estimated at 600.

Watershed Tours:
The City continues to conduct watershed tours in Philadelphia's nine (9) watersheds (Tacony, Frankford, Poquessing, Pennypack, Wissahickon, Cobbs, Darby, Schuylkill, and Delaware) to further enhance the publics understanding and appreciation of watershed issues. Tour guides describe the watershed concept, point out natural and manmade stormwater features and infrastructure, anthropogenic impacts on receiving water quality, benthic and ichthyfaunal assessments, and watershed protection practices. Self-guided tour booklets for each watershed are still in development. Virtual website tours are being developed for the Tacony-Frankford watershed and the Mill Creek Watershed as prototypes for web-based tours.

Members Of The Tacony-Frankford Watershed Partnership Touring The Lower Tacony Creek

Senior Citizen Corps (SEC):
The Water Department continues to work with the Senior Citizen Corps to address pollution problems and water quality monitoring programs for the Monoshone Creek, a tributary to the Wissahickon Creek and to the Tookany Creek. The SEC performs biomonitoring, collects water samples, and conducts physical assessments of the stream. The Water Department assists SEC efforts through the provision of municipal services, education about stormwater runoff and the department's Defective Lateral Program, and mapping services such as GIS. Meetings are

held monthly. The Water Department participated in the second Annual "Monoshone Watershed Day" in October 2000 which drew approximately 100 attendees. A full afternoon of activities included water quality testing, biological water quality assessments, watershed bus tours, and guided walks of the watershed taking off from the grounds of the Unitarian Society of Germantown.

Community Outreach and the Captain Sewer Program: The Water Department continues to organize and distribute information to the public about stormwater runoff and individual environmental stewardship for community groups and other civic and professional organizations. Literature and speakers are provided for community events, health fairs and city events. Captain Sewer teaches young children in schools, camps, libraries, and day care centers about the effects of dumping trash and pollutants into stormwater inlets. As an example of the scope of this outreach program, in May 2001, Captain Sewer presented the Water Department's educational message to more than 1,640 citizens and their throughout the city.

"Captain Sewer" With PADEP Official At The Fairmount Water Works

Schuylkill Center for Environmental Education (SCEE): The PWD's long-term relationship with SCEE involves a state Growing Greener Grant. SCEE has developed, with the support of PWD and the nationally acclaimed Earthforce, a children's environmental program, a water curriculum for the children of The Shawmont School in Roxborough. The Growing Greener grant provides for the Expansion of water messages, specifically around stormwater runoff, to the wider community surrounding the school. The PWD's Public Education Unit, who will be Supporting the grant with publications, tours, and community presentations, will also Have the opportunity to assess the effectiveness of our outreach and messages with A "control" group of approximately 30,000 citizens.

Mill Creek Community: PWD's Office of Watersheds and Public Education Unit are developing a watershed curriculum for the Sulzberger Middle School through a Growing Greener grant that also includes the redevelopment of vacant land for stormwater BMP implementation. Curriculum, activities and materials developed for this important PWD outreach will be replicable by the department for communities and watersheds throughout the city. As part of the grant issued by the Environmental Protection Agency concerning environmental restoration and public outreach in the Mill Creek Watershed, biologists also conducted three days of environmental education programs for students and teachers at Sulzburger Middle School. The education program contains many environmental aspects concerning watershed management, restoration, and the fate of pollution in urban ecosystems. Biologists conducted

Federal, State, And Local Officials Along With Members Of The Mill Creek Coalition During Groundbreaking

demonstration programs directed towards the effects of pollution on the biota of stream systems. Macroinvertebrate and fish analyses were performed by aquatic biologists along with students from Sulzburger. Students were allowed a "hands-on" approach to understand the current biological and physical condition of Cobbs Creek. Students were also questioned about the major reasons for habitat deterioration and the lack of pollution sensitive taxa in the stream. Moreover, students and teachers asked questions concerning their role as environmental stewards in the Mill Creek Watershed. Most of the questions focused on the various ways and methods that the Philadelphia Water Department is conducting concerning pollution removal, trash accumulation in streams and the current status of our watersheds.

PWD's Biologists And Students From Sulzburger Kicknetting For Macroinvertebrates

The Big Brother Big Sister Association of Philadelphia:

During the reporting period, members of the Philadelphia Water Department met with individuals from the Northeast Branch of the Big Brother/Big Sister Association of Philadelphia during a day-long hike in the Pennypack Watershed. During the day, children were educated on various aspects of the watershed which included terrestrial flora and fauna, aquatic life, and the effects of human intervention on the health of the aquatic communities. In addition, children and adults participated in a demonstration concerning rapid biological assessment protocols (RBPs) and its use regarding cumulative effects of pollution on resident biota and the detection of anthropogenic impacts to the aquatic community. During the program children and their mentors learned about the methodology of biomonitoring, identification of macroinvertebrates, and the various metrics used to evaluate the biological integrity of aquatic systems. Habitat evaluations were also incorporated into the program to educate the participants on the deleterious effects of stormwater runoff and point source pollution on the benthic community. The department plans to continue its work with the Northeast Branch of the Big Brother/Big Sister Association of Philadelphia to further their involvement in the Pennypack Watershed.

A Child And His Mentor From The Big Brother/Big Sister Association Of Philadelphia Learning About Pennypack Stream Biomonitoring.

1.8 Public Notification

As discussed in Section 7 of the above report, the Water Department had developed and will continue to distribute a series of informational brochures and other materials about its CSO discharges and the potential affect on the receiving waters. The brochures provide additional information including phone contacts and instructions for reporting any unusual event surrounding a CSO. Brochures and other educational materials discuss the detrimental affects of these overflows and request that the public report these incidences to the department. In addition, the Water Department has enlisted watershed organizations to assist it with this endeavor. The department will continue with this focus in 2002 to continue to raise the level of awareness in its citizens about the function of combined and stormwater outfalls through a variety of educational mediums. The watershed partnerships discussed in the Watershed Planning sections of this report are the primary focus in the public/private efforts to educate, notify, and protect stream water quality.

1.9 Monitoring and Reporting

Reference Philadelphia NMC Report, 9/27/95 Section 9 pp. 1-3 and System Hydraulic Characterization Report, 6/27/95 Section 5, pp. 5-3.

Monitoring and characterization of CSO impacts from a combined wastewater collection and treatment system are necessary to document existing conditions and to identify any water quality benefits achievable by CSO mitigation measures. Monitoring for the efficacy of the Nine Minimum Controls is documented in the above sections and in detail for the maintenance programs in Appendix A & B. Pursuant to meeting the reporting requirements in the NPDES permit, the tables included below provide estimates of the average annual CSO frequency and volume overflow statistics for calendar year 2001. The table is organized to present overflows by the specific receiving water into which the CSO's from a given interceptor system discharge. In order to be consistent, the column headings are presented in the same format found in the System Hydraulic Characterization (SHC) and NMC Documentation. These statistics are also summarized in the Watershed Planning Sections.

1.9.1 Annual CSO Statistics (2001)

The estimated average annual frequency and volume statistics for calendar year 2000 are presented in the following Table.

COBBS CREEK 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Cobbs Creek High Level	26	32	0 - 61	12	760 - 831	61% - 62%	0 - 253
Cobbs Creek Low Level	9	12	0 - 41	10	53 - 58	84% - 85%	0 - 121

DELAWARE RIVER 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Upper Delaware Low Level	12	12	2 - 37	14	462 - 534	69% - 72%	3 - 146
Somerset	8	9	12 - 51	28	2296 - 2605	58% - 60%	23 - 215
Lower Delaware Low Level	27	27	52 - 95	71	1454 - 1649	71% - 73%	3 - 234
Oregon	5	6	21 - 38	28	780 - 833	47% - 48%	64 - 125
Lower Frankford Low Level	5	6	8 - 43	22	611 - 685	56% - 59%	14 - 166

PENNYPACK CREEK 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Pennypack	5	5	5 - 33	14	37 - 44	77% - 79%	8 - 115

SCHUYLKILL RIVER 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency				CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem			Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Central Schuylkill East Side	20	26	0	-	71	17	668	-	744	69%	-	71%	0	-	351
Central Schuylkill West Side	10	10	0	-	51	24	345	-	396	60%	-	64%	0	-	263
Lower Schuylkill East Side	7	9	2	-	47	25	400	-	455	65%	-	67%	3	-	227
Lower Schuylkill West Side	4	4	3	-	46	30	634	-	769	28%	-	32%	4	-	165
Southwest Main Gravity	2	2	2	-	41	22	1076	-	1218	74%	-	76%	3	-	175

TACONY CREEK 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency				CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem			Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Tacony	16	16	2	-	59	23	2314	-	2639	51%	-	53%	2	-	248
Upper Frankford Low Level	12	12	4	-	44	21	200	-	230	70%	-	72%	5	-	180

2.0 Phase II – Capital Improvement Projects

The second phase of the PWD's CSO strategy is focused on technology-based capital improvements to the City's sewerage system that will further increase its ability to store and treat combined sewer flows, reduce inflow to the system, eliminate flooding due to system surcharging, decrease CSO volumes and improve receiving water quality. The recommended capital improvement program is the result of a detailed analysis of a broad range of technology-based control alternatives. The capital improvement plan encompasses the three major areas of the City that are affected by CSO's: the Northeast, Southeast and Southwest drainage districts. Table 2-1 provides a summary of the 17 capital projects described fully in *CSO Documentation – Long Term CSO Control Plan, January 1999*. A column has been added to this table that details the receiving water body that will benefit from the project. Lastly, the completion dates of the respective projects have been modified to be consistent with the Draft NPDES permits.

Table 2-1 Summary of Phase II Capital Projects

Watershed	Project Description	Capital Cost
City Wide Program	Establish Real Time Control (RTC) Center	$350,000
City Wide Program	Targeted Infiltration/Inflow Reduction Programs	$2,000,000
Schuylkill and Delaware	Solids & Floatables Control Program	$380,000
Pennypack	Integrate Water Quality Objectives into Flood Relief Programs	N/A
Pennypack	85% CSO Capture Pennypack Watershed (P-1 through P-5)	$230,000
Tacony - Frankford	RTC - Tacony Creek Park Storage (T-14)	$450,000
Tacony - Frankford	RTC - Rock Run Relief Sewer Storage (R-15)	$490,000
Delaware	Somerset Interceptor Sewer Conveyance Improvements	$300,000
Tacony - Frankford	Frankford Siphon Upgrade	$10,000
City Wide Program	RTC & Flow Optimization - Southwest Main Gravity Interceptor, Cobbs Creek Cut-off, and Lower Schuylkill West Side	$1,750,000
Schuylkill	RTC - Main Relief Sewer Storage (R-7 through R-12)	$650,000
Schuylkill	Eliminate Outfalls: Dobson's Run Phase I	$6,200,000
Schuylkill	Eliminate Outfalls: Dobson's Run Phase II	$7,000,000
Schuylkill	Eliminate Outfalls: Dobson's Run Phase III	$11,700,000
Schuylkill	Eliminate Main & Shurs Outfall (R-20)	$12,000,000
Schuylkill	Eliminate 32nd & Thompson Outfall (R-19)	$1,500,000
Darby - Cobbs	Cobbs Creek Low Level (CCLL) Conveyance Improvements	$440,000
Darby - Cobbs	Cobbs Creek Low Level (CCLL) Control Project	$2,500,000
City Wide Program	WPCP Wet Weather Treatment Maximization Program	$150,000
	Total Phase II Project Cost:	**$48,100,000**

This section presents the status of the capital improvement projects being implemented on a citywide basis.

2.1 I / I Reduction Projects

Start: 9/1/1998 End: Status: Ongoing – Annual

Reference Long Term CSO Control Plan p. 2-5.

Description: Opportunities exist to reduce CSO impacts by means of reducing the entry of stormwater runoff, rainfall-derived I/I, and groundwater infiltration into the sewer system. Appropriate measures will be identified, evaluated, and implemented, where appropriate and cost-effective. There are four basic approaches to CSO control through I/I reduction:

1) Reduce the entry of stormwater runoff (including perennial stream baseflow) into the combined sewer system by diverting streamflow directly to a receiving stream.

2) Reduce the entry of groundwater infiltration to the combined sewers, interceptor sewers, and/or upstream separate sanitary sewers.

3) Reduce the entry of rainfall-derived I/I from upstream sanitary sewer systems.

4) Monitor and study the tidal inflows from river levels exceeding emergency overflow weir elevations at tide gates.

Each of the above methods enables CSO reduction by effectively increasing the capacity in the intercepting sewers and WPCPs available for the capture and treatment of combined wastewater. Several opportunities have already been identified and are currently being evaluated. The estimated costs for the I/I reduction program as documented in the CSO LTCP is $2,000,000.

Environmental Benefits: Since I/I is relatively clean water that occupies conveyance and treatment capacity, eliminating it from the system frees up capacity for the relatively more concentrated combined wastewater. This reduces CSO discharges and enables greater pollutant capture throughout the combined sewer system. An additional benefit of reduced infiltration (and diversion of any perennial streamflow) is the reduction in the operating costs associated with continuously pumping and treating these flows.

Status: This program consists of a combination of investigative and corrective efforts geared at reducing extraneous flows into the combined sewer system.

2.1.1 Infiltration and Inflow Investigation

The CSO program staff is currently putting in place tools to facilitate a prioritization of inflow sources. In 1999, a tabular inflow database was created that included every sewer creek crossing in the city of Philadelphia (hydraulic characterization, location, etc). In 2000, this database was linked with the digitized drainage maps to create graphical displays in GIS. This information will then be used to develop and implement an inflow source inspection plan during calendar 2002 which will define and prioritize I/I remediation projects.

During the period of August 1999 to September 2000, a flow-monitoring contract was awarded to Utility Pipeline Services (UPS). The contract called for installation of 15 temporary flow meters, routine meter maintenance, data downloads, and training for existing PWD instrumentation crews in proper flow monitoring techniques. The new meters, as well as the Departments stock of flow monitors were deployed at various locations throughout the city to support the LTCP projects including the quantification of Rainfall

Dependent Inflow and Infiltration. During 2000, two major flow meter deployments took place. The initial deployment was targeted to the separate sewered area in Northeast Philadelphia and the second deployment targeted the Manayunk/Roxborough area of the Northwest.

From the end of September 2000 and throughout 2001, the PWD's Flow Control Unit took over the flow monitoring program, having been sufficiently trained by the contractor. During 2001 most monitors were transferred from the second deployment sites. The focus of the deployments for 2001 was the Manayunk/Roxborough area in order to provide important flow data in support of the LTCP project - Elimination / Consolidation of Outfalls - *Main & Shurs*. Additional areas in Northeast Philadelphia were also targeted. The separate sanitary areas of Southwest Philadelphia will be the next target area and will occur as monitors are transferred from the Northwest in mid 2002.

The data collected to date has been used to assist in the targeting and prioritization of future projects to reduce the impact of rainfall dependant inflow and infiltration (RDI/I) on Philadelphia's collector system. A RD I/I report summarizing the 1st phase of the assessment program has been completed and an addendum summarizing the second phase of the program will be completed during the 2nd quarter of 2002.

2.1.2 Corrective Actions – Tide Inflow

The System Inventory and Characterization Report (SIAC) identified 88 CSO's influenced by the tides. Many of these sites have openings above the tide gate. During extreme high tides inflow into the trunk sewer can occur. During these events, significant quantities of additional flow can be conveyed to the treatment plant and thus reduce capacity for storm flow, as well as increasing treatment costs. Page 2-12 of the NMC report describes a program to install tide gates, or other backflow prevention structures, at regulators having an emergency overflow weir above the tide gate. This program was completed in June of 1999 and protected all openings up to 1.5' City Datum and resulted in significant inflow reductions. These reductions were estimated in the 1999 annual status report.

After, recent reviews of the study and monitoring data, additional sites were targeted for inflow protection measures. Although situated at elevations significantly higher than extreme high tides, these additional sites have been targeted for additional inflow protection and are summarized in Table 1.1.1. Implementation progress made in calendar year 2001 is listed in Table 1.1.2.

Table 1.1.1 Status tide inflow protection project.

Drainage District	Total # Sites	# Completed
Northeast	21	21
Southwest	7	7
Southeast	6	6
Total	34	34

Table 1.1.2 Emergency overflow weir gates installed during calendar 2001 as part of tide inflow protection project.

Site	Installed
D25 - Somerset St. E of Richmond St.	6/20/01
D17 - Castor Ave. & Balfour St.	5/09/01

Table 1.1.3 In calendar 2001 primary tide gates were installed at locations in need of replacement or new installations.

Site	Installed	Comment
D64 - Washington Ave. E of Delaware Ave.	7/21/01	In-house – Flexible Gate
D25 - Somerset St. E of Richmond St.	5/11/01	Contractor – SS Pontoon
S19 - Lombard St. W of 27th St.	1/15/02	In-house – Flexible Gate
S32 - 49th St. S of Botanic St.	9/21/01	In-house – Flexible Gate
S24 - 1060' S of South St. E of Penn Field	3/04/02	In-house – Flexible Gate
F23 - Bridge St. NW of Creek Basin	11/06/01	In-house – Flexible Gate

2.2 Real-Time Control Program

2.2.1 Establish Real Time Control Center

Start: 4/1/1998 End: 12/1/2003 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-4.

Description: A Real Time Control center (RTC) will be established at the Fox Street facility over the next 3 years. The ultimate goal for this center is to house a centralized RTC system that will allow telemetered commands to be sent to site-specific, automated controls located throughout the collection and treatment facilities. These signals may be transmitted based upon an optimized response to rainfall patterns and are intended to further enhance capture of CSO volume. Establishing a RTC center will enable PWD to provide 24-hr monitoring and eventually, control of key collection system facilities including automated CSO regulators, pump stations, and inter-district diversions.

An RTC facility also will provide the basis for improved management of many aspects of collector system operations, by centralizing collection and processing of data provided by the various automated functions (e.g., CSO monitoring, automated regulators, etc.). By use of RTC, flows are diverted or stored where capacity exists in the system. This function prevents wet-weather overflows prior to maximum use of available conveyance and/or storage capacities, thus allowing for prioritization of overflow locations based on hydraulic or pollutant load characteristics.

Status: The design work for the new Real Time Control Center RTC building is complete, including space development, physical feature and equipment requirements as appropriate for the initial phase of the Center's operation. The project is presently in Projects Control awaiting advertisement and bid. This process usually takes approximately 4 months from the beginning of the advertisement to when construction commences. Projects Control plans to bid the project in early April with construction possibly starting by the summer of 2001. The estimated capital cost for establishing an RTC center is $350,000. The cost of the entire building addition is expected to exceed $1,000,000.

The details for the Decision Support System (DSS), which will provide a means for an operator to obtain information relevant to making control decisions in the event that the system is being operated in supervisory mode, are continuing to be designed. The DSS will provide an interface to many different kinds of information that currently exist within PWD, but are not currently available from a single interface. The scope of the DSS will focus on the identification of these relevant data sources and the construction of a "proof-of-concept" prototype DSS.

2.2.1 RTC – SWMG, CC, LSWS

Start: 7/1/1998 End: Status: In-Progress

Reference Long Term CSO Control Plan p. 2-13.

Description: A number of interrelated projects in the Southwest Drainage District (SWDD) were determined to enhance the operation of the high-level and low-level collection systems and consequently maximize capture and treatment of wet-weather flows at the SWWPCP. Each of the high-level interceptor systems that discharge to the SWWPCP can influence the hydraulic capacity and treatment rate of the other high-level interceptor systems, as they compete for capacity in the Southwest Main Gravity (SWMG) into the plant. Therefore, several integrated projects were proposed together to establish a protocol for prioritizing flow from each interceptor system. These projects will be defined and implemented in conjunction with a centralized real-time control (RTC) system (see 10.5.1 - *Real Time Control Center*). In addition, the RTC system will control the Triple Barrel reach of the SWMG, and will control the diversion from the SWMG to the Lower Schuylkill West Side Interceptor (LSWS), thereby enabling use of the full capacities of these interconnected conduits during wet-weather.

The individual projects that constitute the SWMG optimization program are: adding a RTC system with monitoring at approximately six locations and automated gate structures at seven locations, modifying the SWMG Triple Barrel sewer at 70th & Dicks St.; replacing the dry weather outlet (DWO) pipe and raising the dam at regulator C_17, modifying the regulators along the LSWS interceptor, and modifying the hydraulic control point regulators along the SWMG to pass more flow to the LSWS. The total estimated cost for these projects is $1,750,000.

Status: During the first year of the project, Reid Crowther Consulting, Inc. set up an RTC model using SewerCAT software developed by Reid Crowther. Existing Stormwater Management Model (SWMM) data for the SWDD was imported into this model. Hydraulic conditions of the SWDD were assessed, current systems and practices were reviewed, an RTC objective function was identified. Several technical approaches and operational modes were assessed, and an automatic system with the availability of supervisory control constitutes the present operating strategy. A technical memorandum was completed describing the facilities required for the implementation of RTC in the SWDD; an implementation plan has been developed and preliminary budget estimates were produced.

During the calendar year 2001, the SWDD RTC strategy was further refined and analyzed and a draft conceptual design memorandum was completed describing the RTC facilities, system strategies and objectives, cost estimates for RTC implementation, analysis of alternative scenarios, and work plan for the development of an RTC decision support system. The proposed RTC scenarios were modeled using the EXtended TRANsport (EXTRAN) component of SWMM and were quantified in terms of CSO volume estimates, impact on wet weather hydraulic grade lines (HGLs) and flows at selected locations, and costs/benefits.

The SWDD RTC conceptual design memorandum outlines recommendations for the modifications to the SWDD collection system in three phases. Phase I includes enlarging of the DWO pipe and raising the diversion dam at the C_17 regulator , modifying the operation of CSPS based on the level in the CCLL interceptor, and regulating inflows from S_27 to the SWMG using a DWO sluice gate under RTC. In addition, installation of a side-overflow weir at the West Barrel at the 70th & Dicks Triple Barrel and opening the East and Center Barrels open for dry weather flow is encompassed in Phase I of the RTC project. Phase II concentrates on decreasing overflows in the LSWS by enlarging the S_45 DWO pipe and regulating inflows using a computer-controlled DWO sluice gate. The strategy for Phase II also incorporates closing of DWO shutter gates at S_43 and S_47. The final phase of the RTC conceptual design is enlargement of the

S38 DWO pipe and regulating flows using a computer-controlled DWO gate. The total mechanical and construction costs of all three phases are estimated to be $1,254,000 or $0.003/gallon of average annual reduced overflow volume per year. A final conceptual design memorandum should be completed by mid-2002.

2.3 WPCP Flow Optimization (Stress Testing)

Start: 1/1/1998 End: 5/1/2001 Status: Complete

Reference Long Term CSO Control Plan p. 2-17 – 2-21.

The plant stress testing project established:

- Maximum and average flows that should be treated in various unit processes for current and future operations;
- Ranges of hydraulic, solids and BOD_5 loads that could be applied to the various unit processes and yet obtain maximum removal efficiencies in each unit process;
- Changes in plant processes and operations (such as increased loads, MLSS levels, changes in sludge wasting, return activated sludge (RAS) ratios, detention times, etc.) that would increase removal efficiencies; and
- Magnitudes of excess capacity, if any, in each unit operation of the plant (increased flow through plant process units) that could be achieved and still meet the discharge permit requirements for each plant.

The results of stress testing allow for a determination of existing and future optimum flows, loads, and operations of the various unit processes. The identification of choke points, deficiencies and unit process capacities are provided in the stress testing summary report that has been developed for each WPCP. Specific WPCP Capital Improvement Projects (CIP) have been identified as potential projects resulting from the findings of the stress testing which were provided as part of the summary reports. The actual need for additional CIPs, and the resulting prioritization of the CIPs and the budgeting, appropriation of monies, scheduling and actual implementation of the CIPs was accomplished within the context of the overall watershed approach to CSO abatement defined in the LTCP.

The Draft Final Report for each of the three WPCPs wastewater treatment plants was submitted by CH2MHill for review on January 28, 2000. The report provided the following information: project objectives and methodology, current performance, maximum instantaneous flow, current sustainable treatment capacity and potential upgrades. The report also included hydraulic and treatment throughput capacities for each plant process, capacity limiting factors, and the potential operating modifications or capital projects whose purpose would be to increase plant throughput.

A subsequent meeting was held to discuss the draft documents. During the meeting and subsequent discussions particular attention was given to developing report summarization. Recommended modifications or upgrades were prioritized and categorized into those potential projects that could be considered for either immediate implementation, resulting in enhanced treatment, or capital improvement projects that could also increase treatment capability but would require PWD expenditures. The various CIPs were also categorized by four treatment objectives including: process improvements, peak primary treatment capacity, peak

secondary treatment capacity, and wet weather treatment capacity. This second categorization provided anticipated combined CIP costs for each of the treatment objectives as well as the peak treatment capacities.

These revisions were made to the draft report and submittal of the Final Report occurred May 1, 2001.

2.4 Specialized Sewer Cleaning Projects

When the FY2000 Sewer Cleaning contract was extended, Mobile Dredging and Pumping Company were retained to perform the sewer cleaning work for FY2001. A budget of $1,000,000.00 was allocated for the sewer cleaning contract for FY2001. The following was a list of sewers added to the previous contract:

1) South Street between Front Street and Intercepting Chamber D-58.
2) Pollock Street / Packer Avenue sewer between Pollock and Camac Streets and Packer and Delaware Avenues at Intercepting Chamber D-72.
3) Upper Schuylkill East Side Interceptor between the Flat Rock Siphon and Gustine Lake

The results of the cleanings performed under this contract are as follows:

South Street Between Front Street and D-58
This job started on 11/21/2000 and was completed on 12/21/2001. A total of 116 tons was removed from this 550-foot long section at a cost of $66,000.00.

Pollock Street Sewer Between Camac Street and D-72
This job started on 4/24/2001 and was completed on 10/02/2001. The total length of that section was 13,520 linear feet. The total amount of debris removed from this sewer was 1,529.45 tons. The total cost to clean this sewer was $605,816.77. A remaining section of 800 linear feet was not cleaned under this contract but will be contracted out under the FY2002 sewer cleaning contract.

Upper Schuylkill East Side Interceptor Sewer
This project started on 4/23/2001 and was completed on 9/28/2001. A total of 464.44 tons was removed from this sewer. The total cost to clean the sewer was $118,921.08.

The Philadelphia Water Department Procurement Department is currently reviewing the contract specifications for the next sewer cleaning contract. Upon the completion of their review, the contract will be placed for bidding by outside contractors.

Under this new contract, during calendar year 2002, the following sewers have been prioritized for cleaning.

Columbia Avenue trunk sewer just west of Beach Street. This trunk sewer starts at the first manhole access just west of Beach Street and extends through Intercepting Chamber D-42, 310 feet to the Delaware River Outfall.

Marlborough Street trunk sewer starts just upstream of Allen Street and extends 425 feet to Intercepting Chamber D-43 at the Delaware River.

Frankford Avenue South of Frankford Creek. This trunk sewer starts at Intercepting Chamber F-10 and extends 425 feet upstream, through a junction chamber to 2nd access manhole located on Jasper Street.

Bristol Street / Duncan Street under I-95. The first trunk sewer starts at Intercepting Chamber F-13 located on Duncan Street and the second trunk sewer starts at Intercepting Chamber F-14 located on Bristol Street. Both of these pipes meet at a junction chamber downstream. At the junction chamber, one pipe leaves the chamber and extends downstream along a drainage right-of-way to a tide gate located just upstream of the Frankford Creek outfall. The length of this section is 2,030 feet.

Packer Avenue at Delaware Avenue twin trunk sewers start at Intercepting Chamber D-72 and extend 400 feet upstream to the first access manhole located just west of Delaware Avenue in the Port Authority parking lot.

The Central Schuylkill East Side Interceptor is being considered for cleaning under the FY 2002 sewer cleaning contract. Due to high flow in this sewer, PWD contracted out Walker Diving Contractors, Inc., to provide a grit profile for this sewer. Some technical problems are currently being addressed (such as the installation of additional access manholes at several ninety-degree sewer bends) in order to be able to clean this sewer.

2.5 Solids / Floatables Control Pilot Program

Start: 3/1/1996 End: 12/5/2003 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-6.

Description: This project involves the reduction in floatables to receiving waters, most notably the Delaware and Schuylkill Rivers, to improve water quality and aesthetics of surrounding parks and recreational areas. Although the NMCs and the projects contained herein increase system-wide capture of solids and floatables, implementation of additional measures will be examined in pilot projects. For example, the outfall at regulator T-4 was recently equipped with a floatables net trap which will capture floatables at this location. This installation will reduce the quantity of discharge at this location as well as provide data to support the floatables monitoring effort.

Additionally, PWD will pilot the use of a floatables skimming vessel to remove debris from targeted reaches of the Delaware and Schuylkill Rivers. It is proposed that a relatively small (20 to 30 foot) vessel be used for this pilot study at an estimated cost of up to $380,000.

Environmental Benefits: Reduction in floatables improves both water quality and aesthetics of receiving streams. The use of a skimmer vessel also allows for a mobile control program capable of managing debris at various locations, increasing the effectiveness of this control measure. In addition, the boat will be a visible control, and will increase the public awareness and education of floatables' impacts.

Pilot Netting Facility Operational Summary: A pilot netting facility at the T-4 outfall has been collecting debris from CSO's since April of 1997. Since the installation of the netting device, 68 nets have been replaced (34 visits) with an approximate total of 4900 pounds of captured debris. The floatables removed from the net have been compared with other floatables control technologies employed by the City. More specifically, on an area weighted basis the inlet cleaning program data suggests that street surface litter dominates the volume of material that can enter the sewer system. The pilot in-line netting system installed at T_4 has been shown to capture debris on the same order as the WPCP influent screens indicating that effective floatables control in urban areas needs to control sources in addition to CSO's.

Status: During calendar year 2001, the Philadelphia Water Department investigated and surveyed the Schuylkill River from Fairmount Dam to its confluence with the Delaware River (approximately 8.1 river

miles) and from the mouth of the Schuylkill River to the Benjamin Franklin Bridge (7.6 river miles) to take preliminary notes to help identify problematic areas of trash accumulation and deposition. During 2001, the small vessel was used to investigate docking and dry docking locations for a larger floatables-skimming vessel to be operated on the Lower Schuylkill River and the Delaware River. It was also used to determine areas of excessive trash accumulation. In order for the PWD to develop an operational plan for the skimming vessel, an assessment of the areas of access and debris accumulation is needed. The operational plan will be based on the results of additional field data collection, which will better define the relative quantities and transport dynamics of floating debris on the Delaware and Schuylkill rivers. Field sheets have been created to best document the floatables characteristics. These sheets include fields for debris type, density, sources, photos taken, etc. A schedule of field information collection has also been developed.

The Department has continued to explore additional funding sources, which will be necessary in order to completely fund a full scale skimming operation. Also during 2001, a contract was initiated with Hydroqual, Inc. to perform an alternatives analysis for the skimming vessel project.

3.0 Phase III – Watershed-Based Planning and Management

3.1 Introduction

The third component of the City's CSO strategy involves a substantial commitment by the City to watershed planning to identify long term improvements throughout the watershed, including possibly additional CSO controls, that will result in further improvements in water quality and, ultimately, the attainment of water quality standards. The need for this watershed initiative is rooted in the fact that insufficient physical, chemical and biological information currently exists on the nature and causes of water quality impairments, sources of pollution, and appropriate remedial measures. Because of this deficiency, it is currently impossible to determine what needs to be done for additional CSO control or control of other wet weather sources throughout the watershed. This deficiency, especially with respect to the effects of wet weather discharges and receiving water dynamics, is increasingly recognized nationwide and has led to a broader recognition of the need for watershed-based planning and management to properly define water quality standards and goals. The PWD believes that the National CSO Policy, state and federal permitting and water quality management authorities, cities, environmental groups, and industry, now recognize that effective long-term water quality management can be accomplished only through watershed-based planning.

Further, watershed planning is not only mandated by the CSO Policy and guidance documents, but also is consistent with the current Clean Water Act (CWA) and its regulations, as well as the priorities announced by EPA's Office of Water (See EPA's Watershed Approach Framework, Office of Water, June 1996). Therefore, as discussed in Section II and throughout this report, watershed-based planning and management must not only be fully embraced, but initiatives for development of watershed plans must be actively pursued by the City in cooperation with other stakeholders. This must be done not only to comply with the directions of the CWA, the CSO Policy, and other guidance, but more importantly, to define, prioritize and address the most important causes of non-attainment in the watersheds and to move toward attainment of water quality standards and achievement of beneficial uses.

At the same time, however, the City realizes that effective watershed planning is, even in its simplest form, quite difficult. Understanding the complex, interrelated chemical, biological, hydrologic and hydraulic processes that govern water quality is a very expensive, lengthy process that requires extensive, site-specific data and technical analyses. Establishing stakeholder groups, building consensus, articulating goals and objectives, assessing water quality and water quality impacts of point sources and a vast array of non-point sources, reviewing and possibly revising water quality standards to reflect wet weather processes in water

bodies, establishing and implementing water quality based controls, evaluating their effectiveness and financing the cost of studies, design and implementation watershed-wide, requires extensive commitment and resources of a broad range of stakeholders. The process of watershed planning does not happen overnight. The City, nonetheless, is determined to reduce CSO discharges in the near term and undertake, in cooperation with other agencies and stakeholders, comprehensive watershed planning over the next several years.

In light of this commitment and consistent with the CSO LTCP, sections 3-9 describe the status of the various components of the initiative that PWD is undertake to initiate and support watershed-based planning in each of the watersheds within the PWD service area.

3.2 CSO Receiving Water Bodies and Their Watersheds

Water bodies receiving CSO discharges in the PWD service area include the Cobbs/Darby Creeks, the Pennypack Creek, the Tacony/Frankford Creeks, the Schuylkill River and the Delaware River. Although they do not have CSO discharges, the Wissahickon and Poquessing Creeks are important waterways within the PWD service area. These water bodies and the drainage area of the tributary watersheds served by combined sewers are shown in Figure 3-1. There are 178 point sources of CSO discharge from the PWD sewer system to these waterways. Table 3-1 below indicates the number of CSO point sources and the number of major separate stormwater outfalls on each waterway, as identified in the City's NPDES permits.

TABLE 3.2.1 CSO and Stormwater Point Source Discharges to Tributaries

Waterway	Number of CSO Point Sources	Number of Major Stormwater Outfalls
Cobbs/Darby Creeks	38	3
Delaware/Schuylkill Rivers (tidal)	100	30
Pennypack Creek	5	130
Poquessing Creek	0	141
Schuylkill River (non-tidal)	3	32
Tacony/Frankford Creeks	32	35
Wissahickon	0	63

3.3 Overview of Watershed Management Planning Work Scope

This section outlines the elements of the Phase III Watershed Planning Initiative as described in the PWD CSO LTCP. Watershed planning includes various task ranging from monitoring and resources assessment to technology evaluation and public participation. The following is a list of typical tasks and subtasks included in most watershed planning programs. It is provided here for purposes of defining the PWD's proposed program in the following pages:

General Activities

- Management and facilitation
- Public Participation and Information
- Funding Support

Step 1 Preliminary Reconnaissance Survey

- Data collection and assessment
- Preliminary water quality assessment
- Land use and resource mapping
- Inventory of point and non-point sources
- Definition of regulatory issues and requirements
- Preliminary biological habitat assessment
- Reconnaissance stream survey
- Preliminary problem assessment

Step 2 Watershed Work Plan and Assessment

- Monitoring, sampling and bioassessment
- QA/QC and data evaluation
- Watershed modeling
- Waterbody modeling
- Problem definition and water quality goal setting
- Technology evaluation
- Economic assessment and funding requirements
- Public Involvement
- Development of *Watershed Management Plan*

Step 3 Watershed Plan Implementation

- Institutional arrangements
- Implementation programs
- Monitoring and measures of success

The scope and importance of each task will vary among watersheds as a result of site-specific factors such as the environmental features of the watershed, regulatory factors such as the need to revise permits or complete TMDLs for the watershed, available funding, extent of previous work, land use and size of the watershed, the nature of businesses and industry, the level of involvement and resources of other stakeholders, and numerous other factors. The study area watersheds have a diverse range of planning needs that range from those of the Delaware, that has a long-standing river basin commission and has been the focus of major monitoring and modeling studies, to those of the Tacony Creek watershed, for which very little data and analysis are available. The actual scope of each task will be developed and described in a work plan or similar document by each stakeholder group at the commencement of watershed planning activities.

The purpose of the Step 1 Reconnaissance Survey is to review existing information, gain a good, non-quantitative understanding of the physical, chemical and biological conditions of the water bodies, understand the character of the watershed land uses that will drive wet weather water quality conditions, and build a common understanding of these factors among all stakeholders. From this understanding more detailed monitoring, modeling, mapping, and analytical work , which is more time consuming and expensive, can be better scoped and scheduled to meet the specific needs of the watershed. A key goal of this preliminary assessment is to define the particular pollutant parameters that are key to attainment of WQS and to define cost-effective baseline and Step 2 water quality and flow monitoring programs to supply information needed to determine attainment and develop an effective management plan.

At the beginning of each watershed program, a preliminary assessment must be performed of the conditions in each of the water body segments, supported either by direct observations or computer model simulations of current water quality conditions in each segment. Comparisons must be made to numeric and narrative limits relative to the water quality criteria appropriate for protection of both the present uses and those designated in the Commonwealth's regulations. In cases of non-attainment of criteria, it is necessary to determine if the non-attainment is related to dry weather conditions, wet weather conditions, or both. For all of the water bodies, except for the Delaware and tidal Schuylkill Rivers, the PWD will assist with the technical elements of these initial assessments. This assessment is confirmed with current, more detailed information during the Step 2 assessment. The goal will be to develop a matrix that could be used to describe the adequacy of existing data and the attainment of water quality standards for both wet and dry periods. Completion of this matrix for each major segment of each waterbody also would help define the baseline and wet weather monitoring programs that are required to determine attainment and measure improvement in water bodies. The overall purpose of Task 2 is to put in place the information, science and technology needed to make good decisions on pollution control actions and priorities.

Section 3 - Darby-Cobbs Watershed

1.0 CSO Capital Improvement Projects

1.1 Cobbs Creek Low Level (CCLL) Control Project

Start: 6/1/1998 End: 5/1/2000 Status: Complete

1.2 Cobbs Creek Low Level (CCLL) Improvements

Start: 4/2/1998 End: 12/1/2000 Status: Complete

Reference Long Term CSO Control Plan p. 2-16.

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Darby-Cobbs Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillywater.org/Darby-Cobbs

2.1 Preliminary Reconnaissance Survey

The Darby and Cobbs Creeks Watershed include parts of Chester, Delaware, Montgomery, and Philadelphia Counties and covers 77 square miles. The watershed discharges to the Delaware River through the wetlands of Tinicum Wildlife Refuge. The Cobbs Creek Watershed and Tinicum Wildlife Refuge are sub-watersheds of the Darby Creek. Cobbs Creek and its tributaries drain the eastern portion of the watershed and comprise about 29 percent of the watershed. The Tinicum Wildlife Refuge drains the southern-most portion of the watershed, which accounts for 19 percent of the total watershed area.

The watershed discharges to the Delaware River through the wetlands of Tinicum Wildlife Refuge. The watershed is highly urbanized in the lower reaches with mixed land uses, although mostly urban, in the upper reaches. Approximately 500,000 people live within the drainage area of the Darby and Cobbs Creeks, based on 1990 census data, yielding a population density of almost 10 persons/acre. In addition to CSO discharges to Cobbs Creek from the City of Philadelphia, both watersheds receive a number of point and non-point source discharges that likely impact water quality.

With the final addition of a comprehensive biologic study described in section 2.1.2 during calendar 2001, the technical aspect of the Step 1 - Preliminary Reconnaissance Survey has been completed. A general partnership, steering committee, technical committee, and a public participation committee now meet on a regular basis to discuss the integration of numerous Federal, State, and local programs into a more comprehensive watershed management plan. In addition to the formation of an initial stakeholder body, significant progress was made towards developing the technical tools that comprise the preliminary reconnaissance survey as described in the CSO LTCP. The following technical documents comprise the preliminary reconnaissance survey:

TM#1 - Historical Water Quality for The Darby and Cobbs Creeks Watershed
TM#2 - Analysis of 1999 Monitoring Data for The Darby and Cobbs Creeks Watershed
TM#3 – A screening Level Contaminant Loading Assessment for the Darby and Cobbs Creek Watershed
TM#4 –Documentation of the Biological Assessment of the Cobbs Creek Watershed.

2.2 Watershed Work Planning & Assessment

In order to characterize the Darby-Cobbs watershed and define particular pollutants that inhibit the attainment of water quality standards in the watershed, a water quality sampling plan was developed and implemented. In the year 2000, the Phase II water quality sampling plan was initiated and it continued through 2001. The sampling plans developed included discrete sampling and continuous water quality monitoring using Sondes. During the Phase I water quality sampling, the discrete samples were collected weekly in wet and dry weather. Phase II water quality sampling concentrated on wet weather the discrete sampling supplemented with Sonde data collection. The Phase II water quality sampling continued in 2001.

Specifically, continuous water quality measurements were made at four sites for a total of 3,802 hours of quality-assured data. During continuous sampling, data for selected parameters are collected at 15-minute increments by a submerged instrument (YSI Sonde 6600) over approximately two weeks. Parameters measured include stage, dissolved oxygen, temperature, pH, and turbidity. Sites sampled and duration sampling were as follows: DCC-110 (680 hours), DCC-115 (583 hours), DCC-455 (1,076 hours), and DCC-770 (1,462 hours). An updated watershed characterization and assessment report is being prepared for release in 2002. Quality Assurance and Control plans have been developed for each phase of the monitoring work to document the Standard Operating Procedures.

A set of watershed indicators was developed in 2001 and a draft outline of the Watershed Management Plan was also produced in calendar 2001.

2.3 Public Involvement and Education

The Darby-Cobbs Watershed Partnership was facilitated in 1999 by the Philadelphia Water Department to create a framework for all stakeholders in the 75 square mile Darby-Cobbs watershed basin to provide

environmentally sound solutions to improve the water quality of the Darby-Cobbs creeks. Permit holders, participating agencies, and community-based organizations are constructing this framework upon regulatory and voluntary activities. To this end, the Partnership itself is a public participation mechanism, and acts as a forum for participating members to work together to develop a watershed strategy that meets state and federal regulatory requirements but that also embraces the environmental/public sensitive approach to improve stream water quality and quality of life in communities. Members of the Darby-Cobbs Watershed Partnership include, in addition to the municipalities and townships that reside in the watershed:

- The Philadelphia Water Department
- The Fairmount Park Commission
- The Pennsylvania Environmental Council
- The PA Department of Environmental Protection
- The US Fish and Wildlife Commission
- The Cobbs Creek Community Environmental Education Center
- The Delaware Creek Valley Association
- The Delaware County Planning Department
- The Academy of Natural Sciences
- Lower Merion Township
- The Environmental Protection Agency
- Natural Lands Restoration Environmental Education Project
- Sunoco – South Philadelphia Refinery

As one of the first steps in defining its framework, the Partnership developed a mission statement:

"To improve the environmental health and safe enjoyment of the Darby-Cobbs Watershed by sharing resources through cooperation of the residents and other stakeholders in the Watershed."

The Partnership operates through three working committees. The committees include:

The Steering Committee serves as the coordinating body for various watershed projects and activities. The committee began the drafting of a municipal/partner resolution to formalize the roles and responsibilities of participating partners. This resolution will provide the basis for joint implementation of a watershed management plan. In 2001, the committee began researching a framework for a watershed management plan and met with PA DEP officials to discuss existing initiatives and has hired a consultant with experience in the development of such plans. In 2002, the Steering Committee will begin outlining this framework, establishing priorities for the watershed, identify potential funding opportunities, and begin the development of such plans on a subwatershed basis. In 2001, the Steering Committee met on January 4 and May 31 and then continued watershed management research in meetings and conference calls out of committee.

The Technical Committee role is to develop a common understanding of technical issues, share resources and information. This committee also evaluates alternatives for improving water quality and developing and promoting innovative management techniques. During 2000, this committee was instrumental in the review of a series of technical reports that were published and shared with Partnership members. These reports provide the data foundation for the development of the watershed management plan. The reports reviewed and published in 2000 include:
Technical Memo #1 – Historical Water Quality for the Darby and Cobbs Creeks Watersheds (begun in 1999).
Technical Memo #2 – Analysis of 1999 Monitoring Data for the Darby and Cobbs Creeks Watersheds.
Technical Memo #3 – A Screening Level Contaminant Loading Assessment for the Darby and Cobbs Creeks Watershed.

The investigative and sampling work for Technical Memo #4 – Preliminary Documentation of the Biological Assessment of the Cobbs Creek Watershed, was conducted in 2000. In 2001, the Technical Committee worked on identifying and prioritizing water quality and quantity problems in the watershed and choosing a framework to begin the development of a watershed management plan. Also, much time was devoted to data verification.

The Technical Committee also created a website for the Partnership that publicizes committee and partnership meeting dates, provides meeting minutes, and makes available all technical reports to interested public. The URL for the Partnership is reached at www.phillywater.org and clicking the "Watershed Partnerships" link.

In 2001, the Technical Committee met on February 22, in addition to monthly internal Water Department meetings.

The Public Participation and Education Committee's goal is to increase public understanding and encourage grassroots stewardship in the watershed. During 2001, the Public Participation Committee developed and/or sponsored the following projects and events:

The publishing of the Darby-Cobbs Watershed Residents' Survey which sought to determine resident housing stock, length of residency, watershed knowledge, knowledge of home and street drainage, understanding of non-point source pollutants and causes, changes seen in watershed, main sources of pollution, improvements desired, and interest in participating in watershed protection activities. The survey was distributed to schools, libraries, municipal offices, community centers, newspapers and placed on the Partnership website. A total of 7,000 surveys were printed and 240 were completed and received by the Partnership.

The watershed teacher-training module, developed and implemented in 2000 with support from a Partnership Growing Greener grant, was completed in the first quarter of 2001. Twenty teachers who teach within the Darby-Cobbs watershed completed the final session in spring 2001. The training modules included: Watershed Management, Stormwater Management, Water Quality, Ecological Restoration, and a final Workshop to assist in the creation of service learning projects.

3.0 Annual CSO Statistics

COBBS CREEK 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Cobbs Creek High Level	26	32	0 - 61	12	760 - 831	61% - 62%	0 - 253
Cobbs Creek Low Level	9	12	0 - 41	10	53 - 58	84% - 85%	0 - 121

Section 4 - Tacony-Frankford Watershed

1.0 CSO Capital Improvement Projects

1.1 Frankford Siphon Upgrade

Start: 10/1/1997 End: 7/30/1997 Status: Complete

1.2 RTC - Rock Run Relief Sewer (R_15)

Start: 10/16/1998 End: 9/3/2004 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-9 – 2-10.

Description: The Rock Run Relief Sewer provides flood relief to combined sewer areas upstream of regulator T_08 in the Northeast Drainage District (NEDD). Currently, CSO's discharge into the Tacony Creek at the Rock Run Relief Sewer outfall – an 11' by 14' sewer - during periods of moderate or greater rainfall. Installation of an inflatable dam in the Rock Run Relief Sewer allows for utilization of approximately 2.3 million gallons (MG) of in-system storage to retain combined flows during a majority of these wet weather events. The inflatable dam stores combined flows in the relief sewer until storm inflows have subsided and capacity exists in the Tacony Interceptor for conveyance of combined flows to the Northeast Water Pollution Control Plant (NEWPCP). This control technology provides an additional margin of protection against dry weather overflows while still maintaining flood protection for upstream areas. The estimated budget for this job is $490,000.

Status: A design memorandum was completed that lists the expected environmental benefits of the Rock Run Relief Project, quantifies the flooding risks associated with the project, and documents the designed control logic for the inflatable dam's operation and drain-down control. In support of this memorandum, several alternative control logics for the inflatable dam operation and drain-down gate were investigated to develop a logic that minimized the risks of flooding, increased Rock Run Relief storage utilization and eliminated adverse affects of the project at other CSO regulators on the Tacony Creek. A 120 million gallon (13%) reduction in average annual CSO volumes to the Tacony Creek, from the T_08 & R15 outfalls is expected to result from the implementation of this capital project.

1.3 RTC – Tacony Creek Park (T_14)

Start: 10/16/1998 End: 9/3/2004 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-8 – 2-9.

Description: The T_14 trunk sewer system conveys combined sewage from the largest combined sewershed in the PWD collection system. Currently, CSO's discharge into the Tacony Creek at the T_14 outfall – a 21' by 24' sewer - during periods of moderate or greater rainfall. Installation of an inflatable dam in the T_14 trunk sewer allows for utilization of approximately 10 million gallons (MG) of in-system storage to retain combined flows during a majority of these wet weather events. The inflatable dam stores combined flows in the trunk sewer until storm inflows have subsided and capacity exists in the Tacony Interceptor for conveyance of combined flows to the Northeast Water Pollution Control Plant (NEWPCP). This control technology provides an additional margin of protection against dry weather overflows and Tacony Creek

inflows to the combined system while still maintaining flood protection for upstream areas. The estimated budget for this job is $450,000.

Status: A design memorandum was completed that lists the expected environmental benefits of the T14 inflatable dam project, quantifies the flooding risks associated with the project, and documents the designed control logic for the inflatable dam's operation and drain-down control. In support of this memorandum, several alternative control logics for the inflatable dam operation and drain-down gate were investigated to develop a logic that minimized the risks of flooding, increased T14 trunk sewer storage utilization and eliminated adverse affects of the project at other CSO regulators on the Tacony Creek. A 430 million gallon (20%) reduction in average annual CSO volumes to the Tacony Creek, from the T_14 outfall is expected through the implementation of this capital project.

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Tacony-Frankford Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillywater.org/Tacony-Frankford

2.1 Preliminary Reconnaissance Survey

The goals of the Preliminary Reconnaissance Survey are to gain a general understanding of water quality and water pollution control problems within the Tacony and Frankford Creeks Watershed. Once a general idea of where impaired areas are located then a more specific study can be implemented focusing on the problematic sites. Actions taken during the reconnaissance survey include reviewing existing information, developing a preliminary understanding of the physical, chemical and biological conditions of the water bodies, understanding the relationship between land use and water quality and, communicating and facilitating understanding of these factors among the various groups of stakeholders.

The Tacony and Frankford Creeks Watershed study area includes parts of Montgomery County and the greater portion of Philadelphia County, and covers a total of 29 square miles or 20,900 acres. The drainage area discharges to the Delaware River through Frankford Creek, and is highly urbanized in the lower reaches primarily composed of Philadelphia County. The upper reaches of the Tacony-Frankford study area, mostly Montgomery County, are also highly urbanized, however, there is a more varying mixture of land use. Based upon 1990 census data, the population of the study area was approximately 362,000 people yielding an average population density of 20 persons/acre. In addition to CSO discharges to Frankford Creek from the City of Philadelphia, both watersheds receive a number of point and non-point source discharges that likely impact water quality.

In addition to the continued meetings, significant progress was made towards developing the technical tools that comprise the preliminary reconnaissance survey as described in the CSO LTCP. The water quality data obtained during 2000 was analyzed during 2001. Phase II water quality monitoring task were initiated as well. Three continuous sampling deployments were carried out in the Tacony-Frankford Creek watershed in 2001. Site TF01 was sampled in March over a period of 143 hours. Sites TF04 and TF06 were sampled in May for a total of 338 and 335 hours, respectively. Wet weather discrete sampling was carried out at three sites in the Tacony-Frankford Creek watershed 2001. During wet weather sampling, several discrete samples are collected just before and during the course of a wet weather event. The data allow characterization of water quality responses to stormwater runoff and wet weather sewer overflows. Site TF01 was sampled in March 2001; Sites TF02 and TF04 were sampled in May 2001.

Also during 2000-2001, the Office of Watersheds and Bureau of Laboratory Services continued its biological assessments on the Tacony-Frankford watershed. Eight benthic (RBP III) and four ichthyfaunal assessments (Index of Biological Integrity) were completed. Currently, macroinvertebrate identification and metric calculations are being completed along with fish analyses. Biological and physical habitat data are also being compared to the water quality monitoring data (10 week assessment) to provide insight on the current status of the watershed. Technical information is being disseminated to the public as well as stakeholders involved in the watershed planning initiative.

The following documents were produced:

- *Technical Memorandum 1 – Historical Flow and Water Quality*
- *Technical Memorandum 4 - Biologic Assessment of the Tacony-Frankford Watershed*

2.2 Watershed Work Planning & Assessment

A general partnership, technical committee, and a public participation committee have met on a regular basis during 2001. The draft outline for the watershed plan developed for the Darby-Cobbs watershed is expected to form the basis for the plan outline for the Tacony Frankford Watershed.

2.2 Public Involvement and Education

The PWD sponsored Tacony-Frankford Watershed kicked off with its first Partnership meeting on October 4th. The Tacony-Frankford Watershed drains 29 square miles, or 20,900 acres in Philadelphia and Montgomery counties. It is, for the most part, a highly urbanized watershed with a large diverse population that includes portions of the inner city as well as wealthy suburban communities. This partnership, geographically less diverse than the Darby-Cobbs Watershed, was able to tap into a number of organizations and groups that are already involved in neighborhood revitalization. Its members are anxious to tackle projects that will see immediate benefits. Members include:

- Philadelphia Water Department
- Fairmount Park Commission and the Natural Lands Restoration Project
- Pennsylvania Environmental Council
- Frankford Group Ministry
- Melrose Park Neighbors Association
- Friends of Tacony Park
- Edison High School
- Rohm and Haas Co.
- Senior Environmental Corps.
- Awbury Arboretum
- Frankford United Neighbors
- Frankford Style Community Arts
- PA Department of Environmental Protection
- US Environmental Protection Agency
- US Army Corps of Engineers
- Philadelphia Green

- Phila. Urban Resources Partnership
- Cheltenham Township

This Partnership will be modeled after the Darby-Cobbs Partnership in working structure and the technical documents generated. However, we envision that more "hands-on" type of projects will be encouraged and requested on a regular basis. To supplement the work of the Partnership and to further the development of a watershed management plan, the Water Department, Fairmount Park and the Frankford Group Ministry applied for a DCNR grant in October to develop a River Conservation Plan for the Philadelphia county portion of the Tacony-Frankford watershed. The Partnership will be working closely to coordinate this grant with the River Conservation Plan in progress on the Tookany Watershed in Montgomery County. Cheltenham Township, a Partnership member, is developing this RCP.

The creation of a River Conservation Plan (RCP) for the Frankford-Tacony Watershed will enable the City to create an environmental and cultural planning inventory for a highly urbanized watershed with the ultimate goal to develop an holistic management plan that will facilitate restoration, enhancement and sustainable improvements in the designated watershed

3.0 Annual CSO Statistics

TACONY CREEK 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency				CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem			Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Tacony	16	16	2	-	59	23	2314	-	2639	51%	-	53%	2	-	248
Upper Frankford Low Level	12	12	4	-	44	21	200	-	230	70%	-	72%	5	-	180

Section 5 - Pennypack Watershed

1.0 CSO Capital Improvement Projects

1.1 85% CSO Capture – Pennypack Watershed

Start: 2/1/1996 End: 9/7/2004 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-8.

Description: Addressing CSO discharges to Pennypack Creek is a high priority for the CSO Program and is mainly a result of the proximity of the CSO to a smaller receiving stream which enters the Delaware just below the Baxter WTP intake structure. This project will enable capture of 85% of the combined sewer flow in all five Pennypack (PP) CSO basin areas while maintaining existing overall system-wide CSO capture on an average annual basis by modifying the PP, UDLL and LFLL regulators. It was determined that an increase in capacity of approximately 20 cfs was required for the PP interceptor to achieve 85% capture (consistent with the "presumptive" CSO control target defined in national CSO policy). The construction project entails construction of new dry weather outlet (DWO) conduit at 3 of the Pennypack CSO regulators. In addition, the diversion dam height at four PP regulator locations will be raised. Lastly, modifications at twelve Brown & Brown type and automated regulators along the UDLL and LFLL interceptors will be completed in order to provide the required capacity in the UDLL interceptor. These actions will result in 85% CSO capture in the Pennypack watershed. The projected budget for this project is $230,000.

Environmental Benefits: This project will significantly reduce the CSO discharge into Pennypack Creek. The average annual volume of CSO is reduced by 91 MG, from 130 to 58 MG. This represents a reduction of roughly 55% in the average annual volume of CSO and the associated pollutants (bacteria and organic matter from untreated wastes, litter and other solid materials in both wastewater and stormwater runoff, etc.) discharged into Pennypack Creek between Frankford Avenue and the Delaware River. Additionally, this project protects a small stream surrounded by public parkland where recreational activities occur.

1.1.1 Regulator Modifications (P1-P4)

Start: 11/18/1998 End: 9/7/2004 Status: In-Progress

The hydrologic and hydraulic computer models developed by the PWD for the CSO Program were applied to determine new dry weather outlet (DWO) pipe diameters and diversion dam heights necessary to achieve 85% capture of combined flows in the Pennypack basins. A preliminary site plan for the CSO regulator modifications necessary to achieve 85% capture of Pennypack combined flows was completed. Additional monitoring was performed to verify model representations of wet weather inflows in the Pennypack interceptor.

Status: A preliminary site plan was developed for the construction of new CSO regulator chambers at P_1, P_2 and P_4. Model analyses in 1999 refined initial estimates of regulator modifications including new DWO pies and diversion dam heights at these three chambers. In 2000, PWD staff finalized the project's design memorandum and site plans documenting chamber modification specifics that allow for 85% capture of combined flows in the Pennypack basins while maintaining existing levels of CSO capture in the Northeast Low Level System.

The conceptual designs for the new CSO regulator chambers and DWO pipes were completed in 2001 and the project has moved into the final design phase. In 2002 the design plans and specifications should be completed with an expected bid date for the project in late 2002 or early in 2003.

1.1.2 Integrate Water Quality Programs with Storm Flood Relief (WQ & SRF) - Sheffield Ave.
Start: 2/1/1996 End: 6/31/2000 Status: Complete

Reference Long Term Control Plan on page 2-6.

Description: There are several flood relief projects defined and currently in various stages of implementation. However, these projects have been developed to better manage the relatively high flows associated with larger, less frequent events. CSO control is primarily concerned with lower, more frequent flows. There is a potential opportunity to realize multiple benefits from the flood relief projects by expanding the scope of these projects to address both storm flood relief and CSO control objectives. Generally this will require adjusting the design of the individual projects to manage both low and high flows, resulting in the dual benefit of CSO control and flood relief. For example, it may be possible to use a new flood relief sewer to provide storage of low flows for CSO control and conveyance of high flows for flood control. The costs for implementing CSO controls in flood relief projects will be defined on a case-by-case basis.

Environmental Benefits: The specific benefits that accrue will be defined on a case-by-case basis.

Status: The Sheffield Ave. Relief sewer project was undertaken as a demonstration project to examine the process by which the Department could utilize the existing flood relief sewer planning process to gain increased CSO benefit. Design level modeling of the Sheffield and Cottman Avenue sewershed was undertaken from the period from 2/1/1996 to 12/13/1996. The storage and treatment requirements to achieve the 85% capture objective were determined in conjunction with the DWO conduit re-sizing to be completed as part of project 10.3.2 Regulator Modifications (P_1 – P_4) from 12/16/1996 to 3/7/1997. The treatment rates and storage volumes required to achieve 85% capture were used to evaluate diversion structure and regulator alternatives from 3/10/1997 to 7/11/1997. Design specifications were developed from 7/14/1997 to 6/1/1998. The contract was awarded to Lisbon Contractor Inc., at a cost of $5,630,462. This project started on September 15, 1998. Because this project also incorporated 4500 feet of water main replacement in addition to the 3600 feet (various sizes) of sewer to be reconstructed, the contractor has indicated an implementation schedule of 500 calendar days, therefore the revised estimated project completion date for the 85% capture project was moved to November 1, 2000.

Approximately 1000 feet of sewer and most of the water mains were completed in 1998. The new regulator chamber and outfall structure including flexible flap gates for backflow prevention, dam, 24-inch diameter DWO pipe, and interceptor manholes have also been completed. In 2000, the bank rehabilitation work at the outfall, and the installation of approximately 2600 feet of sewer upstream of the outfall was completed.

During 1999, a significant portion of water main replacement and sewer reconstruction was completed. The contractor worked quicker than his original estimate and the majority of the pipe work was competed in March of 2000 and the remainder of the manhole and street level access work was completed in June of 2000. This project is now complete.

2.0 Annual CSO Statistics

PENNYPACK CREEK 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Pennypack	5	5	5 - 33	14	37 - 44	77% - 79%	8 - 115

Section 6 – Delaware River Watershed

1.0 CSO Capital Improvement Projects

1.1 Somerset Interceptor Cleaning

Start: 11/1/1997 End: 1/21/1998 Status: Complete

1.2 Inflow Reduction

An analysis of tidal inflows at CSO regulators was performed to quantify the frequency of river inflows across regulator emergency overflow weirs due to tidal-influenced river levels. Emergency overflow weirs are designed at CSO regulators to prevent flooding of upstream trunk sewer systems during tide gate malfunction. However, during extreme high tides, flow reversals may occur across these weirs resulting in an inflow of river water to the CSO regulator chamber and combined sewer system. To free up capacity taken up by this flow during high tide periods, the PWD has installed tide gates at CSO regulators with low-lying emergency overflow weirs. A list of regulators for installation of overflow weir tide gates was developed through review of PWD's CSO regulator level monitoring data and review of PWD's CSO regulator databases.

Model analyses and review of PWD CSO level monitoring regulator data were performed to estimate the reduction in inflow frequency due to installation of overflow weir gates. Model analyses were performed to quantify the expected decrease in inflow volumes and frequencies in the SEDD for a one-year period, 1998. Table 1 lists the expected decreases in tidal inflow frequencies and volumes in the SEDD, due to the installation of overflow weir tide gates.

Table 1-1 Tidal Inflow Reductions in the SEDD Due to Installation of Overflow Weir Gates

CSO regulator	Reduced inflow frequency	Reduced inflow volume (MG)
D_39	2	0.03
D_44	5	0.38
D_45	103	23.34
D_47	11	1.77
D_51	1	0.36
D_62	1	0.16
D_63	6	1.36
D_64	1	0.13
D_66	6	1.22
D_73	39	24.12

Additional model analyses will be performed in calendar year 2001 to quantify tidal inflow frequency and volume reductions in all three of PWD's drainage districts due to installation of emergency overflow weir gates.

2.0 Watershed Management Planning

In calendar 2001 the CSO sub-committee and the Estuary Model development committees did not meet, but some study reports were issued with CSO-related content. PWD supported the development of the PCB development in the Estuary, by participating in committee meetings, sampling, and contributing to the development of source track down and NPS and wet-weather monitoring programs.

Draft reports from the DRBC regarding wet weather impacts and overall monitoring suggest that fecal coliform standards are being met in the main stem estuary in the Philadelphia region most of the time. [1] DRBC indicated that further work on Bacteria Total Maximum Daily loads that might be required would occur in 2005. Dissolved oxygen concentrations in the Estuary were shown to be largely unaffected by CSO contributions. [2] As a result, monitoring and planning priorities continue to focus on the tributaries.

3.0 Annual CSO Statistics

DELAWARE RIVER 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency			CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem		Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Upper Delaware Low Level	12	12	2	-	37	14	462	-	534	69%	-	72%	3	-	146
Somerset	8	9	12	-	51	28	2296	-	2605	58%	-	60%	23	-	215
Lower Delaware Low Level	27	27	52	-	95	71	1454	-	1649	71%	-	73%	3	-	234
Oregon	5	6	21	-	38	28	780	-	833	47%	-	48%	64	-	125
Lower Frankford Low Level	5	6	8	-	43	22	611	-	685	56%	-	59%	14	-	166

[1] Santoro, E., Draft Delaware Estuary Monitoring Report, November 1999.
[2] Hydroqual, Inc., Task 3.0 Evaluation of Wet Weather Impacts, 1999

Section 7 – Schuylkill River

1.0 CSO Capital Improvement Projects

1.1 RTC – Main Relief Sewer

Start: 8/1/1999 End: 6/15/2004 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-13 – 2-14.

Description: The Main Relief Sewer provides flood relief to combined sewer areas in all three of PWD's drainage districts (Northeast, Southeast and Southwest). The Main Relief Sewer discharges to the Schuylkill River at Fairmount Park, a highly visible recreational area. Currently CSO is released into the river at the Main Relief Sewer outfalls during periods of moderate or greater rainfall. There exists within the single large (13.5' by 13.5' box) sewer above these outfalls a potential storage volume of approximately 4.0 million gallons (MG), and during all but the largest rainfalls most or all of this volume is available to store the overflow that otherwise discharges to the river. However, in order to use this 4.0 MG of storage, an inflatable dam is required in the box sewer just above the Main Relief Sewer outfalls to the Schuylkill River. This dam will reduce CSO discharges to the Schuylkill River by utilizing the relief sewer's in-system storage. This control technology provides an additional margin of protection against dry weather overflows while still maintaining flood protection for upstream communities. The inflatable dam maintains the stored flow in the relief sewer and a new connecting sewer drains the stored flow to an existing, nearby interceptor. The projected cost for this project is $650,000.

Environmental Benefits: This project will reduce the discharge of combined sewer overflow (CSO) into the Schuylkill River. An average annual reduction in CSO volume of 50 MG/year is expected at the Main Relief Sewer outfalls through use of the available in-system storage volume. This represents a reduction of approximately 70% in the average annual volume of CSO and a significant reduction in the associated pollutants (bacteria and organic matter from untreated wastes, litter and other solid materials in both wastewater and stormwater runoff, etc.) discharged into the Schuylkill River at this location, within Fairmount Park, at the historic Fairmount Water Works. Since this project modifies an existing structure (the Main Relief Sewer) rather than constructing a new one, it provides control very cost-effectively (unit cost for this storage is $0.10/gal versus roughly $6/gal for siting, designing, and constructing a new storage structure).

Status: A design memorandum was produced that lists the expected environmental benefits of the Main Relief Project, quantifies the flooding risks associated with the project, and documents the designed control logic for the inflatable dam's operation and drain-down control. In support of this memorandum, several alternative control logics for the inflatable dam operation and drain-down gate were investigated to develop a logic that minimized the risks of flooding, increased Main Relief storage utilization and eliminated adverse affects of the project at other CSO regulators on the Schuylkill River.

Design of the Main Relief Sewer DWO conduit and a new segment of CSES interceptor sewer including a drop structure to eliminate odors was completed in 1999. Construction of the DWO pipe was completed as well as the construction on the rehabilitation of the CSES interceptor and drop structure. Construction of the chambers that will store the electronic and mechanical equipment associated with the inflatable dam has also been completed. The plans and technical specifications for the inflatable dam in the Main Relief Sewer are complete and undergoing final review. Meetings will be held with Fairmount Park some time early in 2002 to finalize the coordination requirements and schedule for this project since it is located in a high profile area of the park adjacent to the Philadelphia Museum of Art. The project will be bid subsequent to the Park meetings.

1.2 Elimination / Consolidation of Outfalls - Main & Shurs

Start: 9/4/1998 End: 12/24/2004 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-15.

Description: The relief overflow at R_20 (Main Street and Shurs Lane) was constructed due to chronic flooding during wet weather. High flow in the Upper Schuylkill East Side (USES) Interceptor, caused by infiltration and inflow from separate sanitary areas, reduces the available capacity at R_20. Currently, overflows occur during periods of relative high rainfall. Preliminary estimates indicate that a 2.0 MG of storage would be required under current conditions to eliminate R_20. However, given the sensitivity of the project design to inflow and infiltration (I/I), further evaluation of I/I (see *Targeted Infiltration and Inflow Studies*) and available sewer capacity is required in order to refine the indicated facility size. The estimated cost (prior to design and land acquisition) for this project is $12,000,000.

Environmental Benefits: An average annual reduction in CSO volume of 10 MG is achieved by eliminating the R_20 overflow.

Status: During 2001, work has focused on I/I identification and removal, sewer maintenance, and the sizing and siting of a storage facility for various levels of I/I reduction.

Eight flow monitors and 2 level sensors were installed for various durations during 2001. The collected data has been used to characterize the system and identify sources of I/I that are contributing to the overflow problem. The flow data from the eight monitors was used to perform dry-weather characterizations of the contributing sewersheds. Dry weather flows were characterized on a per capita and per acre basis and compared with expected or typical values. This analysis indicated a significant source of inflow in the upper end of the intercepting system. Per capita dry weather flows were observed to be as much a seven times as much as values typically found elsewhere in the system. Per capita flows this high usually indicate a significant source of inflow such a stream. Further investigations identified the water distribution system as a potential source. Television inspections isolated the source of the inflow to the Upper Roxborough Storage Facilities. A 48-inch basin effluent main was taken out of service and the inflows decreased significantly. The main will be excavated to identify and repair the leak in 2002. The repair is expected to remove a minimum of 0.25 MGD of inflows from the interceptor freeing up additional capacity in the system.

Grit buildup has prevented reliable flow (only good levels) measurements directly in the interceptor at the overflow. Deployment was limited to branch sewers and the upper reaches of the interceptor. Only one sewershed had high levels of infiltration and inflow. The majority has been attributed directly to the interceptor. Video inspections of the interceptor were reviewed in an effort to identify additional sources.

Other sources identified include stormwater inlets connected directly to sanitary lines in the vicinity of Eva Street and Evergreen Street. Additionally, an interceptor manhole with an open grated cover was allowing significant amounts of direct inflow of runoff. This manhole has been properly covered to limit inflows from runoff.

Analyses conducted with hydraulic models of the collection system have demonstrated that grit deposition can have relatively large impact on flow conveyance in the Upper Schuylkill East Side Interceptor. Grit levels are estimated to be at there highest just prior to the cleaning conducted in 1999. The treatment rate (maximum flow prior to an overflow at this location) was estimated to be 15 MGD for this amount of grit deposition. If the sewer grit levels are maintained at a level equivalent to 5% of the interceptor's diameter, the treatment rate improves by 24% to 18.6 MGD. This added treatment rate could significantly reduce the size of the storage facility necessary to eliminate the overflow.

During 1999, a total 14,562 lineal feet (2.76 miles) of sewer was cleaned, removing 450.12 tons of debris at a cost of $285,112. A grit profile was conducted in February 2001 after reports of additional grit build up. Significant amounts of grit were observed between the Manayunk Canal Siphon and the confluence with the Wissahickon Low Level Interceptor. Mobil Dredging and Pumping Company (MD&P CO.) was contracted to perform a second interceptor cleaning. The cleaning began in early 2001 and was completed on September 28, 2001. The cleaning cost was $118,921.08 with a total of 464.44 tons of debris. A total of 13,980 lineal feet (2.65 miles) of sewer was cleaned. Comparisons of pre- and post- cleaning monitored data have shown a significant drop in flow levels in the interceptor.

The collected data has been used to complete the calibration of hydraulic and hydrologic models of the collection system tributary to Main & Shurs. Monitored data has been used to refine baseflow estimates and rain derived infiltration and inflows in monitored areas of the collection system. The calibrated model has been used to size the necessary storage facility for a range of potential alternatives including the removal of stormwater inlets, reducing SIU flows, reducing I&I, and consistently maintaining a clean intercepting system. Additionally, potential facility sites have been identified and all analyses will be summarized into a design memorandum for the Main & Shurs overflow elimination project in early 2002.

1.3 Elimination / Consolidation of Outfalls - 32nd & Thompson

Start: 4/1/1998 End: 9/15/2003 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-15.

Description: Structure R_19 (32nd and Thompson) is a storm relief chamber located on a trunk sewer chamber that flows to structure R_12 (Pennsylvania Ave. & Fairmount Ave). Due to flat conduit slopes and resulting low flow velocities, the trunk has experienced sediment and grit accumulation across 75% to 90% of its cross-section between R_19 and R_12. Flow Control Unit has operated a temporary monitor in the overflow conduit at R_19 for approximately one year. In this time, there have been six recorded wet-weather overflows. Inspections indicated this sewer is difficult to clean and the historical records indicated there might be structural deficiencies. Therefore this sewer will be reconstructed at a steeper grade.

Once the sewer is reconstructed, it will be monitored. Model runs currently indicate that a reconstructed sewer will have sufficient capacity to eliminate all overflows from this site. Grit accumulation will be monitored at this location and cleaning will be scheduled as needed. Subsequently R_19 will be bulkhead and removed from service. The estimated cost for this project is $1,500,000.

Environmental benefits: This project will eliminate one of the City's CSO overflows, resulting in 0.5 MG reduction of overflow volume on an average annual basis.

Status: The design plans for the sewer reconstruction were completed in 1998. The new design allows for an increased grade to be achieved and therefore the reoccurrence of grit deposition is expected to be eliminated. The contract development was coordinated with CSX and MCI who have track and duct bank facilities that coincide with the sewer alignment. The issues with CSX and MCI were resolved in the fall of 2000. Projects Control bid this project in April of 2001. The bids are currently under review in the Water Departments Design Branch. Construction should commence in the summer of 2002.

1.4 Elimination / Consolidation of Outfalls - Stokely & Roberts (R_ 22)

1.4.1 Stokely & Roberts (R_ 22) - Dobson's Run Phase I

Start: 5/1/1996 End: 10/4/1998 Status: Complete

Reference Long Term CSO Control Plan p. 2-14 – 2-15.

Description: Temporary dams were installed in the Dobson's run storm sewer. Flow was diverted to the Wissahickon High Level interceptor at Stokely St. & Roberts Ave. through hydraulic control point R_22, and to the Upper Schuylkill East Side interceptor at South Ferry Road and Kelly Drive through CSO S_01T. The LTCP includes a $6,500,000 program of sewer construction in the upper reaches that will allow R_22 to be removed from service. Two additional phases of the project will eliminate S_01T from service with an estimated cost of $18,700,000.

Environmental Benefits: This project will eliminate two of the City's intercepting chambers and will completely eliminate CSO overflows, resulting in a 173-MG reduction of overflow volume on an average annual basis.

Status: This project entails the reconstruction of the storm and sanitary sewer from Wissahickon Ave. to Roberts Ave. and elimination of the overflow chamber located at Stokely & Roberts (R_22). The contract was awarded to A.P. Construction and construction commenced on 7/18/1996. The construction, including the elimination of the R_22 chamber, was completed on 10/4/1998 at a total cost of $7,040,000. (The estimated construction cost was $ 5.8 million).

1.4.2 Kelly Drive (S_01T) - Dobson's Run Phase II

Start: 6/1/1997 End: 1/8/2004 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-14 – 2-15.

Phase II of the Dobson's Run Reconstruction consists of the sewer reach from Henry Ave. to Kelly Drive and eliminates temporary CSO S_01T. In order to take advantage of economies of scale, design work for Phase II and III of Dobson's Run has been combined into one project because both phases involve tunneling.

The estimated cost for both phases of the 4000 linear foot sewer reconstruction is $16.0 million. In 2001, a second phase of geotechnical investigations was undertaken to further clarify the subsurface conditions at several locations along the proposed tunneling route. The final geotechnical report will be completed by spring of 2002. Progress is being made in the obtainment of the required permits for the reconstruction of the storm water outfall to the Schuylkill River. A permit has been received from the Army Corps of Engineers and an approval letter from the PA Scenic Rivers Program for the proposed work. There are several minor items that will be addressed in regards to the PADEP permit for the outfall. The PWD has obtained the occupancy agreement for tunneling under the CSX railroad tracks and are currently in the process of securing easements from several property owners along the proposed tunnel route. PWD is optimistic that all the required permits and easements will be secured and the project ready for bid some time in 2002.

1.4.3 Kelly Drive (S_01T) - Dobson's Run Phase III

Start: 7/1/2001 End: 1/8/2004 Status: In-Progress

Reference Long Term CSO Control Plan p. 2-14 – 2-15.

Phase III will eliminate all CSO discharge from occurring at S_01T and has been combined with Phase II for contract development and bid purposes. See Above.

2.0 Watershed Management Planning

A comprehensive, watershed-based, Source Water Assessment was complete by PWD in conjunction with PA DEP and other watershed stakeholders for the Schuylkill River Basin. Reports, information, and updates can be accessed at www.schuylkillswa.org

3.0 Annual CSO Statistics

SCHUYLKILL RIVER 2001 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency				CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem			Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Central Schuylkill East Side	20	26	0	-	71	17	668	-	744	69%	-	71%	0	-	351
Central Schuylkill West Side	10	10	0	-	51	24	345	-	396	60%	-	64%	0	-	263
Lower Schuylkill East Side	7	9	2	-	47	25	400	-	455	65%	-	67%	3	-	227
Lower Schuylkill West Side	4	4	3	-	46	30	634	-	769	28%	-	32%	4	-	165
Southwest Main Gravity	2	2	2	-	41	22	1076	-	1218	74%	-	76%	3	-	175

Section 8 - Watershed Technology Center

During 2001, PWD continued to explore funding opportunities and institutional arrangements pursuant to advancing the concept of a sustainable watershed technology center as described in the CSO LTCP. Funding has been secured to implement the Urban Watershed Institute at the Fairmount Water Works Interpretive Center. During the watershed planning studies for each of the above watersheds, PWD has and will continue to supply technical resources towards completing watershed management plans. Web pages are up and running for the Darby-Cobbs Creek, Tacony-Frankford Creek, and Schuylkill River watersheds. Technical reports, event calendars, discussion forums, water quality data, photo libraries, GIS maps, and other technical resources are available.

Appendix A – Flow Control CSO Maintenance Summaries

PWD FLOW CONTROL

COMBINED SEWER OVERFLOW MAINTENANCE

CALENDAR YEAR 2001

PART 1 PHILADELPHIA WATER DEPARTMENT **Section 1**

DRY WEATHER STATUS WASTE AND STORM WATER COLLECTION

REPORT FLOW CONTROL UNIT **FY 2001**

COLLECTOR	Jul-00	Aug-00	Sep-00	Oct-00	Nov-00	Dec-00	Jan-01	Feb-01	Mar-01	Apr-01	May-01	Jun-01	Totals
UPPER PENNYPACK - 5 UNITS													
INSPECTIONS	21	35	38	27	29	31	26	30	25	20	26	28	336
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
UPPER DELAWARE LOW LEVEL - 12 UNITS													
INSPECTIONS	38	61	38	66	50	43	59	67	35	47	61	52	617
DISCHARGES	0	0	0	0	0	0	0	0	1	0	0	0	1
LOWER FRANKFORD CREEK - 6 UNITS													
INSPECTIONS	13	24	27	30	26	19	20	14	32	22	26	30	283
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
LOWER FRANKFORD LOW LEVEL - 10 UNITS													
INSPECTIONS	41	66	27	53	30	31	36	54	51	60	46	38	533
DISCHARGES	0	3	0	0	0	0	0	0	0	0	0	0	3
FRANKFORD HIGH LEVEL - 14 UNITS													
INSPECTIONS	73	82	68	87	65	50	100	85	88	101	77	61	937
DISCHARGES	0	1	2	0	0	1	0	0	0	0	0	1	5
SOMERSET - 9 UNITS													
INSPECTIONS	21	31	39	48	23	18	34	25	26	31	29	41	366
DISCHARGES	0	0	1	0	0	0	0	0	0	0	0	0	1
LOWER DELAWARE LOW LEVEL - 33 UNITS													
INSPECTIONS	172	162	176	121	152	139	163	164	177	144	120	116	1806
DISCHARGES	0	1	0	0	1	0	1	0	0	0	0	0	3
CENTRAL SCHUYLKILL EAST - 18 UNITS													
INSPECTIONS	84	88	100	93	62	71	103	75	95	75	108	102	1056
DISCHARGES	0	1	1	0	0	0	0	0	0	0	0	0	2
LOWER SCHUYLKILL EAST - 9 UNITS													
INSPECTIONS	26	11	26	47	29	20	40	27	37	37	47	32	379
DISCHARGES	0	0	0	1	0	0	0	0	0	0	0	0	1
CENTRAL SCHUYLKILL WEST - 9 UNITS													
INSPECTIONS	32	40	45	37	20	30	33	33	49	43	44	48	454
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTHWEST MAIN GRAVITY - 10 UNITS													
INSPECTIONS	52	57	48	65	38	44	52	51	59	63	48	42	619
DISCHARGES	0	0	1	0	0	0	0	0	0	0	0	0	1
LOWER SCHUYLKILL WEST - 4 UNITS													
INSPECTIONS	31	26	33	20	24	11	20	16	22	17	19	20	259
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
COBBS CREEK HIGH LEVEL - 23 UNITS													
INSPECTIONS	57	76	70	87	89	28	56	61	110	72	84	74	864
DISCHARGES	0	0	1	0	0	1	0	0	0	0	0	0	2
COBBS CREEK LOW LEVEL - 13 UNITS													
INSPECTIONS	28	41	44	39	31	23	40	28	43	40	20	40	417
DISCHARGES	1	0	0	0	1	1	0	0	0	0	0	0	3

PHILADELPHIA WATER DEPARTMENT
WASTE AND STORM WATER COLLECTION
FLOW CONTROL UNIT

FY2001 BLOCKAGES CLEARED

COLLECTOR	Jul-00	Aug-00	Sep-00	Oct-00	Nov-00	Dec-00	Jan-01	Feb-01	Mar-01	Apr-01	May-01	Jun-01	Totals
UPPER PENNYPACK - 5 UNITS													
BLOCKS CLEARED	1	5	0	0	0	0	1	0	1	1	0	2	11
UPPER DELAWARE LOW LEVEL - 12 UNITS													
BLOCKS CLEARED	0	7	2	3	3	0	0	3	2	5	0	4	29
LOWER FRANKFORD CREEK - 6 UNITS													
BLOCKS CLEARED	0	0	0	0	1	0	0	0	2	3	0	2	8
LOWER FRANKFORD LOW LEVEL - 10 UNITS													
BLOCKS CLEARED	0	7	0	1	0	0	0	0	4	4	0	4	20
FRANKFORD HIGH LEVEL - 14 UNITS													
BLOCKS CLEARED	0	4	5	3	0	2	0	1	0	1	0	5	21
SOMERSET - 9 UNITS													
BLOCKS CLEARED	1	5	4	7	0	1	0	0	1	3	0	3	25
LOWER DELAWARE LOW LEVEL - 32 UNITS													
BLOCKS CLEARED	4	17	25	13	13	3	2	2	14	11	0	12	116
CENTRAL SCHUYLKILL EAST - 18 UNITS													
BLOCKS CLEARED	0	12	5	13	4	0	2	1	1	2	0	6	46
LOWER SCHUYLKILL EAST - 9 UNITS													
BLOCKS CLEARED	0	0	5	6	1	0	0	0	1	1	0	2	16
CENTRAL SCHUYLKILL WEST - 9 UNITS													
BLOCKS CLEARED	0	4	0	2	1	0	0	2	4	2	0	0	15
SOUTHWEST MAIN GRAVITY - 10 UNITS													
BLOCKS CLEARED	1	21	24	18	0	0	0	2	9	23	0	0	98
LOWER SCHUYLKILL WEST - 4 UNITS													
BLOCKS CLEARED	0	3	6	5	6	0	0	0	0	6	0	2	28
COBBS CREEK HIGH LEVEL - 23 UNITS													
BLOCKS CLEARED	1	2	1	5	1	3	0	1	2	0	0	0	16
COBBS CREEK LOW LEVEL - 13 UNITS													
BLOCKS CLEARED	1	2	1	0	2	1	0	0	0	0	0	0	7
RELIEF SEWERS - 27 UNITS													
BLOCKS CLEARED	0	0	0	0	0	0	0	0	0	0	0	0	0
200 CSO UNITS													
TOTALS / MONTH													
TOTAL BLOCKS CLEARED	9	89	78	76	32	10	5	12	41	62	0	42	456
AVER. # of INSP. / BC	82	9	11	12	22	61	166	63	22	13	n/a	18	44

FY 2001 **CSO REGULATING CHAMBER MONTHLY INSPECTION** **NEWPC & SEWPC PLANT REGULATORS**

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
UPPER PENNYPACK									**5**	**NEWPC UNITS**					
TOTAL	**21**	**35**	**38**	**27**	**29**	**31**	**26**	**30**	**25**	**20**	**26**	**28**	336	5.6	5.5
P01	4	7	8	5	6	6	6	6	6	4	5	6	69	5.8	5.3
P02	4	8	7	5	5	6	5	5	5	4	6	6	66	5.5	5.5
P03	5	9	8	6	6	7	7	8	5	6	5	6	78	6.5	4.7
P04	4	6	10	6	6	6	5	8	5	3	5	5	69	5.8	5.3
P05	4	5	5	5	6	6	3	3	4	3	5	5	54	4.5	6.8
UPPER DELAWARE LOW LEVEL									**12**	**NEWPC UNITS**					
TOTAL	**38**	**61**	**38**	**66**	**50**	**43**	**59**	**67**	**35**	**47**	**61**	**52**	617	4.3	7.4
D02	4	5	5	6	7	5	7	6	4	7	4	5	65	5.4	5.6
D03	4	5	5	6	6	5	5	8	4	6	5	6	65	5.4	5.6
D04	3	5	5	6	6	5	7	7	4	6	6	6	66	5.5	5.5
D05	3	5	3	6	7	5	4	5	4	2	6	6	56	4.7	6.5
D06	3	6	4	6	5	3	5	7	4	5	6	5	59	4.9	6.2
D07	3	5	3	5	4	3	5	6	3	2	4	4	47	3.9	7.8
D08	3	6	2	5	3	3	6	6	2	3	5	3	47	3.9	7.8
D09	2	5	2	5	2	2	5	6	2	2	6	3	42	3.5	8.7
D11	3	5	2	6	3	3	4	5	2	3	5	4	45	3.8	8.1
D12	3	5	2	5	3	3	5	4	2	3	5	4	44	3.7	8.3
D13	4	5	3	5	2	3	4	4	2	4	5	3	44	3.7	8.3
D15	3	4	2	5	2	3	2	3	2	4	4	3	37	3.1	9.9
LOWER FRANKFORD CREEK									**6**	**NEWPC UNITS**					
TOTAL	**13**	**24**	**27**	**30**	**26**	**19**	**20**	**14**	**32**	**22**	**26**	**30**	283	3.9	7.8
F13	2	4	6	5	5	4	4	2	5	4	4	6	51	4.3	7.2
F14	3	4	5	5	5	3	4	2	5	4	5	6	51	4.3	7.2
F21	2	4	4	5	3	3	3	2	5	3	5	5	44	3.7	8.3
F23	2	4	4	5	5	3	3	3	6	4	5	5	49	4.1	7.4
F24	2	4	4	5	4	3	3	3	6	4	4	4	46	3.8	7.9
F25	2	4	4	5	4	3	3	2	5	3	3	4	42	3.5	8.7
LOWER FRANKFORD LOW LEVEL									**10**	**NEWPC UNITS**					
TOTAL	**41**	**66**	**27**	**53**	**30**	**31**	**36**	**54**	**51**	**60**	**46**	**38**	533	4.4	7.2
F03	5	7	3	6	2	5	5	5	6	6	6	6	62	5.2	5.9
F04	5	7	4	6	4	5	4	7	8	8	7	6	71	5.9	5.1
F05	5	5	2	6	2	3	3	7	8	7	7	3	58	4.8	6.3
F06	5	5	2	6	3	4	3	6	7	7	4	4	56	4.7	6.5
F07	4	5	2	5	3	4	3	6	5	6	4	3	50	4.2	7.3
F08	4	5	2	5	4	2	4	5	4	6	4	3	48	4.0	7.6
F09	4	10	3	5	4	2	4	6	5	7	4	5	59	4.9	6.2
F10	4	10	3	5	3	3	5	6	4	7	4	5	59	4.9	6.2
F11	3	5	3	4	2	1	2	3	2	2	3	1	31	2.6	11.8
F12	2	7	3	5	3	2	3	3	2	4	3	2	39	3.3	9.4
FRANKFORD HIGH LEVEL									**14**	**NEWPC UNITS**					
TOTAL	**73**	**82**	**68**	**87**	**65**	**50**	**100**	**85**	**88**	**101**	**77**	**61**	937	5.6	5.9
T01	3	3	3	5	3	2	3	2	5	3	4	3	39	3.3	9.4
T03	5	6	6	6	5	4	8	6	7	7	5	6	71	5.9	5.1
T04	7	8	6	8	7	4	10	5	9	8	6	6	84	7.0	4.3

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
SOMERSET LOW LEVEL									**9**	**NEWPC UNITS**					
TOTAL	**21**	**31**	**39**	**48**	**23**	**18**	**34**	**25**	**26**	**31**	**29**	**41**	366	3.4	9.2
D17	3	3	7	6	3	2	5	3	3	5	4	6	50	4.2	7.3
D18	3	3	4	6	4	2	5	3	3	5	4	6	48	4.0	7.6
D19	3	3	6	5	3	2	3	3	4	5	4	6	47	3.9	7.8
D20	3	4	6	5	3	3	3	3	4	4	3	5	46	3.8	7.9
D21	1	4	3	5	2	2	3	2	2	2	3	5	34	2.8	10.7
D22	2	4	3	5	2	2	4	3	2	3	3	3	36	3.0	10.1
D23	1	3	4	6	2	2	4	2	3	2	3	3	35	2.9	10.4
D24	1	3	3	6	2	1	4	3	2	3	3	3	34	2.8	10.7
D25	4	4	3	4	2	2	3	3	3	2	2	4	36	3.0	10.1
LOWER DELAWARE LOW LEVEL									**33**	**SEWPC UNITS**					
TOTAL	**172**	**162**	**176**	**121**	**152**	**139**	**163**	**164**	**177**	**144**	**120**	**116**	1806	4.6	6.8
D37	6	4	5	4	9	6	7	5	6	7	3	4	66	5.5	5.5
D38	6	4	5	4	5	6	8	6	6	7	4	3	64	5.3	5.7
D39	6	5	4	4	3	4	7	4	3	6	3	4	53	4.4	6.9
D40	5	3	5	4	4	5	8	6	5	6	4	4	59	4.9	6.2
D41	5	3	3	4	4	3	6	4	4	4	4	4	48	4.0	7.6
D42	5	3	2	4	4	4	6	5	5	4	4	4	50	4.2	7.3
D43	5	3	2	4	7	4	6	6	5	5	4	4	55	4.6	6.6
D44	8	4	6	4	2	5	7	5	7	5	4	4	61	5.1	6.0
D45	6	6	8	7	6	5	8	7	5	3	4	5	70	5.8	5.2
D46	6	5	5	4	6	5	7	7	4	3	4	5	61	5.1	6.0
D47	5	7	8	4	6	3	5	7	7	3	5	5	65	5.4	5.6
D48	7	8	9	4	7	4	8	6	8	4	4	4	73	6.1	5.0
D49	5	6	7	4	4	3	5	7	5	5	5	5	61	5.1	6.0
D50	7	8	9	4	4	3	7	5	7	5	5	3	67	5.6	5.4
D51	6	5	8	4	4	4	5	5	5	4	4	4	58	4.8	6.3
D52	4	5	5	3	4	3	5	6	6	3	5	4	53	4.4	6.9
D53	4	4	4	3	4	4	3	4	6	3	4	3	46	3.8	7.9
D54	4	4	4	3	4	4	3	4	6	3	3	3	45	3.8	8.1
D58	4	5	6	3	4	4	5	6	6	6	4	4	57	4.8	6.4
D61	5	5	4	3	4	5	4	4	5	3	4	4	50	4.2	7.3
D62	4	6	4	3	3	5	4	4	5	4	4	3	49	4.1	7.4
D63	4	8	8	3	5	6	5	5	7	5	3	4	63	5.3	5.8
D64	5	5	6	3	4	5	2	5	4	5	3	3	50	4.2	7.3
D65	4	4	7	4	4	3	2	5	5	4	3	3	48	4.0	7.6
D66	5	3	7	3	5	3	2	6	5	5	2	2	48	4.0	7.6
D67	6	7	4	3	5	5	3	6	5	4	3	3	54	4.5	6.8
D68	8	7	7	4	5	4	4	4	7	5	3	2	60	5.0	6.1
D69	5	3	4	4	5	4	2	3	5	3	3	3	44	3.7	8.3
D70	5	4	4	4	4	4	4	4	6	4	3	3	49	4.1	7.4
D71	5	4	4	4	5	4	4	3	5	4	3	3	48	4.0	7.6
D72	4	5	3	2	4	5	3	2	3	4	3	3	41	3.4	8.9
D73	4	4	4	3	4	4	3	2	3	4	3	3	41	3.4	8.9
D75 *	4	5	5	3	4	3	5	6	6	4	3	1	49	4.1	7.4

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK									**5 UNITS**				
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
P01													0
P02													0
P03													0
P04													0
P05													0
UPPER DELAWARE LOW LEVEL									**12 UNITS**				
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
D02													0
D03													0
D04													0
D05													0
D06													0
D07									1				1
D08													0
D09													0
D11													0
D12													0
D13													0
D15													0
LOWER FRANKFORD CREEK									**6 UNITS**				
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
F13													0
F14													0
F21													0
F23													0
F24													0
F25													0
LOWER FRANKFORD LOW LEVEL									**10 UNITS**				
TOTAL	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
F03													0
F04													0
F05													0
F06													0
F07													0
F08													0
F09		2											2
F10		1											1
F11													0
F12													0
FRANKFORD HIGH LEVEL									**14 UNITS**				
TOTAL	**0**	**1**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**5**
T01													0
T03			1										1
T04													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL										**9 UNITS**			
TOTAL	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
D17			1										1
D18													0
D19													0
D20													0
D21													0
D22													0
D23													0
D24													0
D25													0
LOWER DELAWARE LOW LEVEL										**33 UNITS**			
TOTAL	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**
D37													0
D38													0
D39													0
D40							1						1
D41													0
D42													0
D43					1								1
D44													0
D45													0
D46													0
D47													0
D48													0
D49													0
D50													0
D51													0
D52													0
D53													0
D54													0
D58													0
D61													0
D62													0
D63		1											1
D64													0
D65													0
D66													0
D67													0
D68													0
D69													0
D70													0
D71													0
D72													0
D73													0
D75													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK 5 UNITS													
TOTAL	**1**	**5**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**2**	11
P01									1			1	2
P02													0
P03	1	3					1			1			6
P04		2											2
P05												1	1
UPPER DELAWARE LOW LEVEL 12 UNITS													
TOTAL	**0**	**7**	**2**	**3**	**3**	**0**	**0**	**3**	**2**	**5**	**0**	**4**	29
D02		1	1						1			1	4
D03				1									1
D04		1						1				2	4
D05													0
D06		1	1					2	1	3		1	9
D07		1			1								2
D08				1	1					2			4
D09					1								1
D11		2											2
D12		1											1
D13				1									1
D15													0
TOTAL	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**3**	**0**	**2**	8
F13									1	1		1	3
F14					1				1	1			3
F21													0
F23										1		1	2
F24													0
F25													0
LOWER FRANKFORD LOW LEVEL 10 UNITS													
TOTAL	**0**	**7**	**0**	**1**	**0**	**0**	**0**	**0**	**4**	**4**	**0**	**4**	20
F03												1	1
F04									1	1		1	3
F05		1		1					1	3			6
F06													0
F07													0
F08													0
F09		2										1	3
F10		1										1	2
F11									1				1
F12		3							1				4
FRANKFORD HIGH LEVEL 14 UNITS													
TOTAL	**0**	**4**	**5**	**3**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**5**	21
T01				1								1	2
T03			1					1					2
T04			1	1						1		1	4

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL 9 UNITS													
TOTAL	**1**	**5**	**4**	**7**	**0**	**1**	**0**	**0**	**1**	**3**	**0**	**3**	25
D17			3	2						1		1	7
D18		1	1	1								1	4
D19	1	4		1								1	7
D20				1									1
D21										1			1
D22													0
D23				1		1			1				3
D24				1									1
D25										1			1
LOWER DELAWARE LOW LEVEL 32 UNITS													
TOTAL	**4**	**17**	**25**	**13**	**13**	**3**	**2**	**2**	**14**	**11**	**0**	**12**	116
D37				1	1				1			1	4
D38			2										2
D39									3			1	4
D40			1	1			2		1			1	6
D41		1		1								1	3
D42													0
D43		1		1	3								5
D44		1		2				1	1			1	6
D45			3	2	1				1	1		1	9
D46			1		1					1			3
D47	1		1	1					1	1		1	6
D48	2	2	3		1	1				1		1	11
D49												2	2
D50		3	2										5
D51			2	1									3
D52					1								1
D53													0
D54										1			1
D58								1	1	1		1	4
D61	1									1			2
D62		1	1							1			3
D63		3	1	1					1				6
D64		1											1
D65		2	2		1	1				1			7
D66		1	1	1	1	1							5
D67		1		1	1								3
D68									1				1
D69													0
D70			1						1	1			3
D71			2		2				2				6
D72			1							1			2
D73			1									1	2
D75													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
CENTRAL SCHUYLKILL EAST SIDE 18 UNITS															
TOTAL	**84**	**88**	**100**	**93**	**62**	**71**	**103**	**75**	**95**	**75**	**108**	**102**	**1056**	**4.9**	**6.4**
S05	6	7	8	5	4	6	5	6	6	4	6	6	69	5.8	5.3
S06	6	7	6	5	4	5	5	5	6	4	6	6	65	5.4	5.6
S07	7	7	7	6	4	5	13	5	5	5	6	7	77	6.4	4.7
S08	7	7	6	5	4	6	6	6	7	6	6	8	74	6.2	4.9
S09	6	6	6	5	4	4	5	5	6	6	6	6	65	5.4	5.6
S10	4	5	6	5	3	5	4	4	4	5	6	6	57	4.8	6.4
S12	5	4	5	5	4	5	7	5	5	5	6	6	62	5.2	5.9
S12A	5	5	5	5	4	5	6	5	5	4	6	6	61	5.1	6.0
S13	4	5	3	5	5	4	5	4	4	4	5	6	54	4.5	6.8
S15	5	5	5	6	5	4	6	5	5	5	6	4	61	5.1	6.0
S16	4	5	5	5	3	4	6	4	5	4	6	5	56	4.7	6.5
S17	4	5	5	5	2	4	6	3	6	4	6	5	55	4.6	6.6
S18	3	4	5	5	2	3	4	3	6	4	6	5	50	4.2	7.3
S19	3	3	6	4	1	3	5	4	5	4	6	4	48	4.0	7.6
S21	4	4	6	6	4	4	5	5	6	5	7	5	61	5.1	6.0
S23	4	3	7	6	3	2	5	2	5	2	6	6	51	4.3	7.2
S25	3	3	6	5	3	1	5	2	5	2	6	5	46	3.8	7.9
S26	4	3	3	5	3	1	5	2	4	2	6	6	44	3.7	8.3
LOWER SCHUYLKILL EAST SIDE 9 UNITS															
TOTAL	**26**	**11**	**26**	**47**	**29**	**20**	**40**	**27**	**37**	**37**	**47**	**32**	**379**	**3.5**	**8.9**
S31	6	3	6	5	4	3	5	3	4	5	6	5	55	4.6	6.6
S35	6	2	5	7	4	2	5	3	4	4	5	4	51	4.3	7.2
S36	1	1	1	4	3	2	4	3	4	4	5	4	36	3.0	10.1
S36A	5	1	4	5	3	3	5	3	4	4	5	4	46	3.8	7.9
S37	0	0	2	5	3	2	7	3	4	4	5	4	39	3.3	9.4
S42	1	0	0	6	3	3	4	3	5	4	5	4	38	3.2	9.6
S42A	1	0	1	5	3	1	4	3	4	4	5	2	33	2.8	11.1
S44	0	2	2	4	3	2	3	3	4	4	5	3	35	2.9	10.4
S46	6	2	5	6	3	2	3	3	4	4	6	2	46	3.8	7.9
CENTRAL SCHUYLKILL WEST 9 UNITS															
TOTAL	**32**	**40**	**45**	**37**	**20**	**30**	**33**	**33**	**49**	**43**	**44**	**48**	**454**	**4.2**	**7.3**
S01	6	5	5	5	2	2	4	4	6	5	6	6	56	4.7	6.5
S02	6	5	5	4	2	2	4	4	6	5	6	6	55	4.6	6.6
S03	6	5	5	4	1	2	4	3	5	5	6	6	52	4.3	7.0
S04	4	5	5	4	2	3	4	4	7	6	6	6	56	4.7	6.5
S11	2	4	5	4	2	4	4	4	5	5	4	5	48	4.0	7.6
S14	2	4	4	4	2	3	4	2	5	5	4	5	44	3.7	8.3
S20	2	4	5	4	3	4	3	4	4	3	4	4	44	3.7	8.3
S22	2	4	5	4	3	5	3	4	5	4	4	5	48	4.0	7.6
S24	2	4	6	4	3	5	3	4	6	5	4	5	51	4.3	7.2
SOUTHWEST MAIN GRAVITY 10 UNITS															
TOTAL	**52**	**57**	**48**	**65**	**38**	**44**	**52**	**51**	**59**	**63**	**48**	**42**	**619**	**5.2**	**8.4**
S27	6	5	4	4	2	3	4	6	5	5	4	5	53	4.4	6.9
S28	3	4	3	4	2	3	4	5	5	5	4	5	47	3.9	7.8

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
COBBS CREEK HIGH LEVEL 23 UNITS															
TOTAL	**57**	**76**	**70**	**87**	**89**	**28**	**56**	**61**	**110**	**72**	**84**	**74**	**864**	**3.1**	**9.9**
C01	2	4	3	4	4	1	2	3	4	3	4	3	37	3.1	9.9
C02	3	4	3	4	4	1	2	2	4	3	4	3	37	3.1	9.9
C04	2	3	3	4	5	2	3	2	5	3	4	3	39	3.3	9.4
C04A	2	3	3	4	5	2	2	2	5	3	4	3	38	3.2	9.6
C05	3	3	2	4	4	1	2	2	5	3	4	3	36	3.0	10.1
C06	2	6	2	4	3	1	2	2	6	3	4	3	38	3.2	9.6
C07	2	4	2	4	4	1	2	2	5	3	4	3	36	3.0	10.1
C09	3	3	4	3	5	2	4	4	8	3	3	5	47	3.9	7.8
C10	3	3	4	3	5	3	4	4	8	3	3	5	48	4.0	7.6
C11	2	3	3	2	3	1	2	1	4	3	2	3	29	2.4	12.6
C12	2	3	3	2	3	1	2	1	4	3	2	3	29	2.4	12.6
C13	3	3	2	2	3	1	2	1	4	3	3	3	30	2.5	12.2
C14	4	2	4	3	3	1	3	3	5	4	3	3	38	3.2	9.6
C15	4	3	4	3	3	1	2	3	5	4	3	3	38	3.2	9.6
C16	4	3	4	3	3	1	4	3	5	4	3	3	40	3.3	9.1
C17	2	2	3	3	3	1	3	2	5	3	3	3	33	2.8	11.1
C31	2	3	3	5	4	1	3	3	4	3	4	3	38	3.2	9.6
C32	2	4	3	5	4	1	2	3	4	3	4	3	38	3.2	9.6
C33	2	3	3	5	5	1	2	3	4	3	4	3	38	3.2	9.6
C34	2	3	3	5	5	1	2	4	4	3	4	3	39	3.3	9.4
C35	2	4	3	5	4	1	2	3	4	3	5	4	40	3.3	9.1
C36	2	4	3	5	4	1	2	4	4	3	5	3	40	3.3	9.1
C37	2	3	3	5	3	1	2	4	4	3	5	3	38	3.2	9.6
COBBS CREEK LOW LEVEL 13 UNITS															
TOTAL	**28**	**41**	**44**	**39**	**31**	**23**	**40**	**28**	**43**	**40**	**20**	**40**	**417**	**2.7**	**11.8**
C18	2	2	5	3	4	1	2	2	4	4	2	4	35	2.9	10.4
C19	3	4	5	3	3	3	3	2	4	3	3	3	39	3.3	9.4
C20	2	5	5	3	4	3	4	3	3	3	2	3	40	3.3	9.1
C21	3	5	4	3	5	4	8	2	4	3	2	3	46	3.8	7.9
C22	2	3	2	3	2	1	3	2	3	3	2	3	29	2.4	12.6
C23	2	3	2	3	4	2	2	2	3	3	1	3	30	2.5	12.2
C24	4	6	3	3	2	1	2	3	4	3	2	3	36	3.0	10.1
C25	3	2	3	3	2	1	3	2	3	3	1	3	29	2.4	12.6
C26	1	2	3	3	1	1	3	2	3	3	1	3	26	2.2	14.0
C27	1	2	3	3	1	1	3	2	3	3	1	3	26	2.2	14.0
C28A	3	2	4	3	1	3	2	2	3	3	1	3	30	2.5	12.2
C29	1	2	2	3	1	1	2	2	3	3	1	3	24	2.0	15.2
C30	1	3	3	3	1	1	3	2	3	3	1	3	27	2.3	13.5
TOTAL	310	339	366	388	293	227	344	291	415	347	370	358	4048		
I /D/C	3.4	3.7	4.0	4.3	3.2	2.5	3.8	3.2	4.5	3.8	4.1	3.9			

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE									**18 UNITS**				
TOTAL	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
S05		1											1
S06													0
S07													0
S08													0
S09													0
S10													0
S12													0
S12A													0
S13													0
S15													0
S16													0
S17													0
S18													0
S19													0
S21													0
S23			1										1
S25													0
S26													0
LOWER SCHUYLKILL EAST SIDE									**9 UNITS**				
TOTAL	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
S31													0
S35													0
S36													0
S36A													0
S37				1									1
S42													0
S42A													0
S44													0
S46													0
CENTRAL SCHUYLKILL WEST									**9 UNITS**				
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
S01													0
S02													0
S03													0
S04													0
S11													0
S14													0
S20													0
S22													0
S24													0
TOTAL	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
S27													0
S28													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL									**23 UNITS**				
TOTAL	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
C01													0
C02													0
C04													0
C04A													0
C05													0
C06													0
C07													0
C09			1			1							2
C10													0
C11													0
C12													0
C13													0
C14													0
C15													0
C16													0
C17													0
C31													0
C32													0
C33													0
C34													0
C35													0
C36													0
C37													0
COBBS CREEK LOW LEVEL									**13 UNITS**				
TOTAL	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
C18													0
C19													0
C20													0
C21	1				1	1							3
C22													0
C23													0
C24													0
C25													0
C26													0
C27													0
C28A													0
C29													0
C30													0
TOTAL DISC	1	1	3	1	1	2	0	0	0	0	0	0	9
	NO OF UNITS IN DISTRICT BLOCKED												
CSE	0	1	1	0	0	0	0	0	0	0	0	0	2
LSE	0	0	0	1	0	0	0	0	0	0	0	0	1

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE 18 UNITS													
TOTAL	**0**	**12**	**5**	**13**	**4**	**0**	**2**	**1**	**1**	**2**	**0**	**6**	**46**
S05		1	1	1									3
S06		1		1			1						3
S07		1			1							1	3
S08		2		1			1					1	5
S09				1								1	2
S10													0
S12					1								1
S12A													0
S13													0
S15		1		1	2					1			5
S16		1		1					1				3
S17		1	1	2									4
S18													0
S19		2		1									3
S21		1		4				1		1			7
S23		1	3									2	6
S25												1	1
S26													0
LOWER SCHUYLKILL EAST SIDE 9 UNITS													
TOTAL	**0**	**0**	**5**	**6**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**2**	**16**
S31			1	1						1			3
S35													0
S36													0
S36A													0
S37			2	1								1	4
S42				3	1				1				5
S42A													0
S44			1										1
S46			1	1								1	3
CENTRAL SCHUYLKILL WEST 9 UNITS													
TOTAL	**0**	**4**	**0**	**2**	**1**	**0**	**0**	**2**	**4**	**2**	**0**	**0**	**15**
S01				1									1
S02													0
S03													0
S04		3						1					4
S11					1				1				2
S14		1								1			2
S20													0
S22				1					2	1			4
S24								1	1				2
SOUTHWEST MAIN GRAVITY 10 UNITS													
TOTAL	**1**	**21**	**24**	**18**	**0**	**0**	**0**	**2**	**9**	**23**	**0**	**0**	**98**
S27													0
S28			1					1					2

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL 23 UNITS													
TOTAL	**1**	**2**	**1**	**5**	**1**	**3**	**0**	**1**	**2**	**0**	**0**	**0**	**16**
C01						1							1
C02	1												1
C04													0
C04A													0
C05				1		1							2
C06													0
C07													0
C09			1	1		1							3
C10													0
C11													0
C12													0
C13													0
C14									1				1
C15													0
C16					1			1	1				3
C17													0
C31		1											1
C32													0
C33				1									1
C34		1											1
C35				1									1
C36				1									1
C37													0
COBBS CREEK LOW LEVEL 13 UNITS													
TOTAL	**1**	**2**	**1**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**7**
C18													0
C19					1								1
C20													0
C21	1		1		1	1							4
C22													0
C23													0
C24		2											2
C25													0
C26													0
C27													0
C28A													0
C29													0
C30													0
TOTAL	3	44	42	49	15	4	2	6	17	34	0	10	226

FY 2001 **RELIEF SEWER MONTHLY INSPECTION**

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
	THOMAS RUN RELIEF SEWER							6	UNITS				
R1	2	2	4	2	2	2	2	1	2	2	2	1	24
R2	2	2	4	2	2	2	2	1	2	2	2	1	24
R3	2	2	4	2	2	2	2	1	2	2	2	1	24
R4	2	2	3	2	2	2	2	1	2	2	2	1	23
R5	2	2	3	2	2	2	2	1	2	2	2	1	23
R6	2	2	3	2	2	2	2	1	2	2	2	1	23
	MAIN RELIEF SEWER							7	UNITS				
R7	2	2	2	2	2	2	2	1	2	2	3	2	24
R8	2	2	2	2	2	2	2	1	2	2	3	1	23
R9	2	2	2	2	2	2	2	1	2	2	3	1	23
R10	2	2	2	2	2	2	2	1	2	2	3	1	23
R11	2	2	2	2	2	2	2	1	2	2	3	2	24
R11A	2	2	2	2	1	2	2	1	2	2	3	2	23
R12	2	2	2	1	2	1	2	1	2	2	3	1	21
	WAKLING RELIEF SEWER							2	UNITS				
R13	1	1	2	3	1	2	1	1	2	1	3	1	19
R14	1	1	2	3	1	2	1	1	2	1	3	0	18
	ROCK RUN STORM FLOOD RELIEF SEWER							1	UNITS				
R15	1	1	1	3	1	2	2	1	2	1	2	2	19
	OREGON AVE RELIEF SEWER							2	UNITS				
R16	4	3	2	2	2	2	3	2	4	3	1	1	29
R17	4	3	2	2	2	3	3	2	4	3	2	1	31
	FRANKFORD HIGH LEVEL RELIEF SEWER							1	UNITS				
R18	1	1	2	4	2	2	2	1	2	1	3	1	22
	32ND ST RELIEF SEWER							1	UNITS				
R19	1	1	2	3	2	2	2	1	2	1	2	1	20
	MAIN STREET RELIEF SEWER							1	UNITS				
R20	1	1	2	2	2	2	2	1	2	1	2	0	18
	SOMERSET SYSTEM DIVERSION CHAMBER							1	UNITS				
R21	1	1	2	3	1	3	2	1	2	11	2	1	30
	TEMPORARY REGULATOR CHAMBER							1	UNITS				
R22													0
R23	1	1	2	2	2	2	1	1	2	1	3	0	18
	ARCH ST RELIEF SEWER							1	UNITS				
R24	3	3	2	2	2	2	3	3	2	1	2	1	26
	16TH & SNYDER							1	UNITS				
R25	2	2	2	2	2	2	1	1	2	2	3	2	23
	GRANT & STATE RD. RELIEF								UNITS				
R26	-----	-----	-----	3	1	2	1	1	2	2	4	2	18
TOTAL	47	45	58	59	46	53	50	29	56	55	65	29	593
AVER	1.7	1.7	2.1	2.2	1.7	2.0	1.9	1.1	2.1	2.0	2.4	1.1	1.8

RELIEF SEWER MONTHLY DISCHARGE PAGE 7

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
	THOMAS RUN RELIEF SEWER							6	UNITS				
R1													0
R2													0
R3													0
R4													0
R5													0
R6													0
	MAIN RELIEF SEWER							7	UNITS				
R7													0
R8													0
R9													0
R10													0
R11													0
R11A													0
R12													0
	WAKLING RELIEF SEWER							2	UNITS				
R13													0
R14													0
	ROCK RUN STORM FLOOD RELIEF SEWER							1	UNITS				
R15													0
	OREGON AVE RELIEF SEWER							2	UNITS				
R16													0
R17													0
	FRANKFORD HIGH LEVEL RELIEF SEWER							1	UNITS				
R18													0
	32ND ST RELIEF SEWER							1	UNITS				
R19													0
	MAIN STREET RELIEF SEWER							1	UNITS				
R20													0
	SOMERSET SYSTEM DIVERSION CHAMBER							1	UNITS				
R21													0
	TEMPORARY REGULATOR CHAMBER							1	UNITS				
R22													0
R23													0
	ARCH ST RELIEF SEWER							1	UNITS				
R24													0
	16TH & SNYDER							1	UNITS				
R24													0
	GRANT & STATE RD. RELIEF							1	UNITS				
R26													0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
UNITS	0	0	0	0	0	0	0	0	0	0	0	0	

FY 2001 **RELIEF SEWER MONTHLY BLOCKS CLEARED**

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
	THOMAS RUN RELIEF SEWER								6 UNITS				
R1													0
R2													0
R3													0
R4													0
R5													0
R6													0
	MAIN RELIEF SEWER								7 UNITS				
R7													0
R8													0
R9													0
R10													0
R11													0
R11A													0
R12													0
	WAKLING RELIEF SEWER								2 UNITS				
R13													0
R14													0
	ROCK RUN STORM FLOOD RELIEF SEWER								1 UNITS				
R15													0
	OREGON AVE RELIEF SEWER								2 UNITS				
R16													0
R17													0
	FRANKFORD HIGH LEVEL RELIEF SEWER								1 UNITS				
R18													0
	32ND ST RELIEF SEWER								1 UNITS				
R19													0
	MAIN STREET RELIEF SEWER								1 UNITS				
R20													0
	SOMERSET SYSTEM DIVERSION CHAMBER								1 UNITS				
R21													0
	TEMPORARY REGULATOR CHAMBER								1 UNITS				
R22						DISCONTINUED PROBLEM CORRECTED								0
R23													0
	ARCH ST RELIEF SEWER								1 UNITS				
R24													0
	16TH & SNYDER								1 UNITS				
R25													0
	GRANT & STATE RD. RELIEF								1 UNITS				
R26													0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
AVER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FY2001 Dry Weather Discharges

Discharge Observed		Discharge Stopped						
Date	Time	Date	Time	Site ID	Collector	Type Unit	Location	Comment
07/03/00	09:10 AM	07/03/00	01:00 PM	C-21	CCLL	SLOT	68th St. & Cobbs Cr. Parkway	Unknown object stuck in the DWO connecting pipe caused a blockage.
08/16/00	08:45 AM	08/16/00	03:30 PM	F-09	LFLL	WH-S	Frankford Ave. N or Frankford Cr.	DWO pipe was blocked with debris. Flushed line to clear the obstruction.
08/17/00	09:00 AM	08/17/00	01:45 PM	F-09	LFLL	WH-S	Frankford Ave. N or Frankford Cr.	5 gal. bucket came down sewer & blocked the DWO opening.
08/17/00	01:45 PM	08/17/00	02:10 PM	F-10	LFLL	WH-S	Frankford Ave. S of Frankford Cr.	Book came down sewer and blocked the DWO opening.
08/22/00	01:00 PM	08/22/00	02:00 PM	D-63	LDLL	B & B	Christian St. W of Delaware Ave.	Shutter gate stuck in the partially closed position. Regulator unit was serviced.
08/26/00	07:15 AM	08/26/00	10:15 AM	T-13	FHL	SLOT	Whitaker Ave. W of Tacony Cr.	Slot opening and connecting pipe filled with grit and needed flushing.
08/30/00	09:30 AM	08/30/00	11:00 AM	S-05	CSES	B & B	24th St. 155 S of Park Towne Place	Large boulders and brick blocked the connecting line.
09/02/00	09:45 AM	09/02/00	10:30 AM	T-11	FHL	SLOT	Ruscomb St. E of Tacony Creek.	A 12" bike rim and tire blocked the slot opening.
09/05/00	02:15 PM	09/05/00	02:50 PM	D-17	SOM	B & B	Castor Ave. & Balfour St.	The shutter gate remained stuck in the closed position.
09/05/00	02:35 PM	09/05/00	03:25 PM	S-23	CSES	B & B	Schuylkill Ave. & Bainbridge St.	A 4' tree trunk was lodged in the regulator opening.
09/11/00	10:05 AM	09/11/00	10:35 AM	T-03	FHL	SLOT	Champlost Ave. W of Tacony Creek.	Rags and other debris blocked the mouth of the slot.
09/11/00	01:36 PM	09/11/00	02:15 PM	S-30	SWM	SLOT	46th St. & Paschall Ave.	Unseen debris blocked the regulator opening.
09/27/00	09:00 AM	09/27/00	02:30 PM	C-09	CCHL	SLOT	64th St. & Cobbs Creek.	Construction lumber blocked the slot opening.
10/02/00	08:38 AM	10/02/00	09:00 AM	S-37	LSES	B & B	Vare Ave. & Jackson St.	Shutter gate blocked with debris.
11/15/00	09:00 AM	11/15/00	11:30 AM	D-43	LDLL	SLOT	Marlborough St. & Delaware Ave.	Debris, rocks & grit blocked the slot opening and connecting pipe.
11/27/00	01:10 PM	11/27/00	06:20 PM	C-21	CCLL	SLOT	68th St. & Cobbs Creek. Parkway	Leaves and plastic containers became lodged in the connecting pipe.
12/14/00	11:15 AM	12/14/00	02:00 PM	C-09	CCHL	SLOT	64th St. & Cobbs Creek.	Small board blocked the DWO connecting pipe.
12/15/00	01:00 PM	12/15/00	02:15 PM	C-21	CCLL	SLOT	68th St. & Cobbs Creek. Parkway	A plastic bottle blocked the DWO connecting
12/29/00	10:30 AM	12/29/00	12:10 PM	T-13	FHL	SLOT	Whitaker Ave. W of Tacony Creek.	The slot box was blocked with wood sticks.
01/03/01	09:00 AM	01/03/01	09:50 AM	D-40	LDLL	SLOT	Berks St. E of Beach St.	Debris blocked the mouth of the DWO connecting pipe.

* There were no observed discharges for this reporting period. Feb. 2001

03/24/01	07:30 AM	03/24/01	11:00 AM	D-07	UDLL	CC-S	Lardner St. SE of Milnor St.	A faulty position sensor on the DWO gate caused the DWO gate to close in dry weather. This raised the trunk level above the overflow point until repairs could be made.

* There were no observed discharges for this reporting period. April. 2001

PART 1 PHILADELPHIA WATER DEPARTMENT **Section 1**

DRY WEATHER STATUS WASTE AND STORM WATER COLLECTION

REPORT FLOW CONTROL UNIT **FY 2002**

COLLECTOR	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02	Totals
UPPER PENNYPACK - 5 UNITS													
INSPECTIONS	22	13	18	10	24	21	38						146
DISCHARGES	0	0	0	1	1	0	0						2
UPPER DELAWARE LOW LEVEL - 12 UNITS													
INSPECTIONS	28	53	48	51	35	50	69						334
DISCHARGES	0	0	0	0	0	0	0						0
LOWER FRANKFORD CREEK - 6 UNITS													
	18	18	15	20	17	16	30						134
DISCHARGES	0	1	0	0	0	0	0						1
LOWER FRANKFORD LOW LEVEL - 10 UNITS													
INSPECTIONS	25	45	37	50	36	35	53						281
DISCHARGES	1	1	0	0	0	0	0						2
FRANKFORD HIGH LEVEL - 14 UNITS													
INSPECTIONS	40	94	96	87	100	89	125						631
DISCHARGES	0	2	0	1	1	0	1						5
SOMERSET - 9 UNITS													
INSPECTIONS	16	31	25	31	23	32	29						187
DISCHARGES	0	0	0	0	0	0	0						0
LOWER DELAWARE LOW LEVEL - 33 UNITS													
INSPECTIONS	148	149	112	144	140	153	169						1015
DISCHARGES	0	0	0	0	0	0	1						1
CENTRAL SCHUYLKILL EAST - 18 UNITS													
INSPECTIONS	97	76	90	82	70	116	96						627
DISCHARGES	0	0	0	1	2	1	0						4
LOWER SCHUYLKILL EAST - 9 UNITS													
INSPECTIONS	42	21	19	23	20	25	23						173
DISCHARGES	0	0	0	0	0	0	0						0
CENTRAL SCHUYLKILL WEST - 9 UNITS													
INSPECTIONS	36	45	13	38	28	27	40						227
DISCHARGES	0	1	0	0	0	0	1						2
SOUTHWEST MAIN GRAVITY - 10 UNITS													
INSPECTIONS	53	59	33	44	47	47	56						339
DISCHARGES	0	0	0	0	0	0	0						0
LOWER SCHUYLKILL WEST - 4 UNITS													
INSPECTIONS	20	14	20	20	22	27	24						147
DISCHARGES	0	0	0	0	0	0	0						0
COBBS CREEK HIGH LEVEL - 23 UNITS													
INSPECTIONS	74	70	69	74	54	56	94						491
DISCHARGES	0	0	0	2	0	0	1						3
COBBS CREEK LOW LEVEL - 13 UNITS													
INSPECTIONS	39	39	31	39	19	27	39						233
DISCHARGES	1	0	0	0	0	0	0						1

PHILADELPHIA WATER DEPARTMENT
WASTE AND STORM WATER COLLECTION
FLOW CONTROL UNIT

FY2001 BLOCKAGES CLEARED

COLLECTOR	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02	Totals
UPPER PENNYPACK - 5 UNITS													
BLOCKS CLEARED	0	0	0	0	6	0	2	0	0	0	0	0	8
UPPER DELAWARE LOW LEVEL - 12 UNITS													
BLOCKS CLEARED	2	6	4	4	8	0	4	3	0	0	0	0	31
LOWER FRANKFORD CREEK - 6 UNITS													
BLOCKS CLEARED	2	1	1	1	1	0	0	0	0	0	0	0	6
LOWER FRANKFORD LOW LEVEL - 10 UNITS													
BLOCKS CLEARED	1	2	1	0	2	0	2	0	0	0	0	0	8
FRANKFORD HIGH LEVEL - 14 UNITS													
BLOCKS CLEARED	0	4	1	4	1	0	2	1	0	0	0	0	13
SOMERSET - 9 UNITS													
BLOCKS CLEARED	2	2	2	5	20	0	4	0	0	0	0	0	35
LOWER DELAWARE LOW LEVEL - 32 UNITS													
BLOCKS CLEARED	8	8	19	20	11	0	36	2	0	0	0	0	104
CENTRAL SCHUYLKILL EAST - 18 UNITS													
BLOCKS CLEARED	6	10	19	11	15	0	23	1	0	0	0	0	85
LOWER SCHUYLKILL EAST - 9 UNITS													
BLOCKS CLEARED	0	1	1	4	1	0	3	0	0	0	0	0	10
CENTRAL SCHUYLKILL WEST - 9 UNITS													
BLOCKS CLEARED	0	1	0	4	4	0	3	2	0	0	0	0	14
SOUTHWEST MAIN GRAVITY - 10 UNITS													
BLOCKS CLEARED	12	20	18	21	26	0	23	2	0	0	0	0	122
LOWER SCHUYLKILL WEST - 4 UNITS													
BLOCKS CLEARED	1	0	6	11	3	0	8	0	0	0	0	0	29
COBBS CREEK HIGH LEVEL - 23 UNITS													
BLOCKS CLEARED	1	0	0	4	5	0	4	1	0	0	0	0	15
COBBS CREEK LOW LEVEL - 13 UNITS													
BLOCKS CLEARED	2	2	1	2	2	0	1	0	0	0	0	0	10
RELIEF SEWERS - 27 UNITS													
BLOCKS CLEARED	0	0	1	0	0	0	1	0	0	0	0	0	2
200 CSO UNITS													
TOTALS / MONTH													
TOTAL BLOCKS CLEARI	37	57	74	91	105	0	116	12	0	0	0	0	492
AVER. # of INSP. / BC	19	14	9	9	7	n/a	8	n/a	n/a	n/a	n/a	n/a	11

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
NORTH RUN C	**UPPER PENNYPACK**								**5**	**NEWPC UNITS**					
TOTAL	**22**	**13**	**18**	**10**	**24**	**21**	**38**	**0**	**0**	**0**	**0**	**0**	146	4.2	7.4
P01	5	3	3	2	6	5	8						32	4.6	6.7
P02	4	3	4	2	4	2	6						25	3.6	8.5
P03	6	2	4	2	7	5	9						35	5.0	6.1
P04	3	3	4	2	4	5	9						30	4.3	7.1
P05	4	2	3	2	3	4	6						24	3.4	8.9
	UPPER DELAWARE LOW LEVEL								**12**	**NEWPC UNITS**					
TOTAL	**28**	**53**	**48**	**51**	**35**	**50**	**69**	**0**	**0**	**0**	**0**	**0**	334	4.0	8.1
D02	4	6	4	5	4	5	6						34	4.9	6.3
D03	4	9	4	4	4	6	8						39	5.6	5.5
D04	2	6	5	4	3	6	8						34	4.9	6.3
D05	2	7	5	4	3	5	6						32	4.6	6.7
D06	2	6	6	4	3	5	7						33	4.7	6.4
D07	2	4	4	4	2	4	4						24	3.4	8.9
D08	2	4	4	6	3	5	8						32	4.6	6.7
D09	2	3	3	4	3	4	5						24	3.4	8.9
D11	2	2	4	4	3	3	5						23	3.3	9.3
D12	2	2	3	4	1	3	4						19	2.7	11.2
D13	2	2	3	4	2	2	4						19	2.7	11.2
D15	2	2	3	4	4	2	4						21	3.0	10.1
	LOWER FRANKFORD CREEK								**6**	**NEWPC UNITS**					
TOTAL	**18**	**18**	**15**	**20**	**17**	**16**	**30**	**0**	**0**	**0**	**0**	**0**	134	3.2	9.8
F13	4	2	3	3	3	1	6						22	3.1	9.7
F14	4	4	3	3	3	1	6						24	3.4	8.9
F21	2	2	2	3	2	2	4						17	2.4	12.5
F23	3	4	3	4	3	7	5						29	4.1	7.3
F24	3	4	2	4	3	3	5						24	3.4	8.9
F25	2	2	2	3	3	2	4						18	2.6	11.8
	LOWER FRANKFORD LOW LEVEL								**10**	**NEWPC UNITS**					
TOTAL	**25**	**45**	**37**	**50**	**36**	**35**	**53**	**0**	**0**	**0**	**0**	**0**	281	4.0	7.8
F03	2	7	3	4	3	2	5						26	3.7	8.2
F04	3	7	4	4	4	2	5						29	4.1	7.3
F05	3	5	3	5	5	5	6						32	4.6	6.7
F06	3	5	4	7	4	3	6						32	4.6	6.7
F07	2	4	4	7	4	3	6						30	4.3	7.1
F08	2	4	4	7	3	4	6						30	4.3	7.1
F09	3	4	4	5	4	5	6						31	4.4	6.9
F10	2	4	4	5	4	4	6						29	4.1	7.3
F11	3	2	3	2	2	3	2						17	2.4	12.5
F12	2	3	4	4	3	4	5						25	3.6	8.5
	FRANKFORD HIGH LEVEL								**14**	**NEWPC UNITS**					
TOTAL	**40**	**94**	**96**	**87**	**100**	**89**	**125**	**0**	**0**	**0**	**0**	**0**	631	6.4	5.3
T01	2	1	4	2	3	1	3						16	2.3	13.3
T03	4	4	6	6	5	8	8						41	5.9	5.2
T04	4	5	6	8	7	6	9						45	6.4	4.7

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
	SOMERSET LOW LEVEL								**9**	**NEWPC UNITS**					
TOTAL	**16**	**31**	**25**	**31**	**23**	**32**	**29**	**0**	**0**	**0**	**0**	**0**	187	3.0	10.4
D17	2	4	3	4	3	4	3						23	3.3	9.3
D18	2	4	3	3	3	4	3						22	3.1	9.7
D19	1	4	2	3	3	5	3						21	3.0	10.1
D20	1	4	3	3	3	4	4						22	3.1	9.7
D21	2	2	3	2	3	3	3						18	2.6	11.8
D22	1	3	3	3	2	3	3						18	2.6	11.8
D23	2	3	2	6	2	3	3						21	3.0	10.1
D24	2	3	2	3	2	3	3						18	2.6	11.8
D25	3	4	4	4	2	3	4						24	3.4	8.9
	LOWER DELAWARE LOW LEVEL								**33**	**SEWPC UNITS**					
TOTAL	**148**	**149**	**112**	**144**	**140**	**153**	**169**	**0**	**0**	**0**	**0**	**0**	1015	4.4	7.2
D37	3	5	4	6	6	5	7						36	5.1	5.9
D38	4	3	3	7	5	5	8						35	5.0	6.1
D39	3	4	3	6	5	7	6						34	4.9	6.3
D40	3	4	3	6	3	6	4						29	4.1	7.3
D41	3	4	3	5	3	4	2						24	3.4	8.9
D42	3	5	3	6	3	4	3						27	3.9	7.9
D43	3	5	2	7	3	4	3						27	3.9	7.9
D44	3	5	3	6	3	6	4						30	4.3	7.1
D45	6	4	2	6	5	5	5						33	4.7	6.4
D46	7	7	5	6	5	7	6						43	6.1	4.9
D47	7	4	2	5	5	6	6						35	5.0	6.1
D48	6	5	4	4	6	7	7						39	5.6	5.5
D49	5	4	2	3	5	6	5						30	4.3	7.1
D50	5	4	3	2	6	8	4						32	4.6	6.7
D51	5	5	3	3	3	4	5						28	4.0	7.6
D52	4	4	3	3	4	3	5						26	3.7	8.2
D53	6	4	3	2	3	3	3						24	3.4	8.9
D54	5	4	3	2	3	3	4						24	3.4	8.9
D58	4	6	3	3	4	4	6						30	4.3	7.1
D61	4	5	2	3	3	4	7						28	4.0	7.6
D62	4	5	2	3	4	5	6						29	4.1	7.3
D63	4	4	2	3	4	4	4						25	3.6	8.5
D64	4	4	4	3	5	4	6						30	4.3	7.1
D65	5	4	4	3	4	3	8						31	4.4	6.9
D66	5	4	5	4	6	4	6						34	4.9	6.3
D67	6	5	8	6	4	4	6						39	5.6	5.5
D68	6	8	6	7	5	6	7						45	6.4	4.7
D69	6	4	4	4	5	5	5						33	4.7	6.4
D70	6	5	5	4	5	3	5						33	4.7	6.4
D71	3	5	4	5	6	6	5						34	4.9	6.3
D72	3	3	4	4	4	4	5						27	3.9	7.9
D73	3	3	2	6	5	1	5						25	3.6	8.5
D75	4	4	3	1	0	3	1						16	2.3	13.3

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK 5 UNITS													
TOTAL	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
P01													0
P02				1									1
P03					1								1
P04													0
P05													0
UPPER DELAWARE LOW LEVEL 12 UNITS													
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
D02													0
D03													0
D04													0
D05													0
D06													0
D07													0
D08													0
D09													0
D11													0
D12													0
D13													0
D15													0
LOWER FRANKFORD CREEK 6 UNITS													
TOTAL	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
F13													0
F14		1											1
F21													0
F23													0
F24													0
F25													0
LOWER FRANKFORD LOW LEVEL 10 UNITS													
TOTAL	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
F03													0
F04													0
F05													0
F06													0
F07													0
F08													0
F09	1												1
F10													0
F11													0
F12		1											1
FRANKFORD HIGH LEVEL 14 UNITS													
TOTAL	**0**	**2**	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**5**
T01													0
T03				1									1
T04													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL 9 UNITS													
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
D17													0
D18													0
D19													0
D20													0
D21													0
D22													0
D23													0
D24													0
D25													0
LOWER DELAWARE LOW LEVEL 33 UNITS													
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**
D37													0
D38													0
D39													0
D40													0
D41													0
D42													0
D43													0
D44													0
D45													0
D46													0
D47													0
D48													0
D49													0
D50													0
D51													0
D52													0
D53													0
D54													0
D58							1						1
D61													0
D62													0
D63													0
D64													0
D65													0
D66													0
D67													0
D68													0
D69													0
D70													0
D71													0
D72													0
D73													0
D75													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK 5 UNITS													
TOTAL	**0**	**0**	**0**	**0**	**6**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	8
P01					3		1						4
P02					1								1
P03					1								1
P04					1								1
P05							1						1
UPPER DELAWARE LOW LEVEL 12 UNITS													
TOTAL	**2**	**6**	**4**	**4**	**8**	**0**	**4**	**3**	**0**	**0**	**0**	**0**	31
D02				1									1
D03	1	3			3		1						8
D04				2	2		1	1					6
D05		3			1		1						5
D06			1					2					3
D07			1										1
D08	1		2	1			1						5
D09													0
D11					1								1
D12													0
D13													0
D15					1								1
TOTAL	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	6
F13													0
F14	1	1		1	1								4
F21													0
F23													0
F24	1		1										2
F25													0
LOWER FRANKFORD LOW LEVEL 10 UNITS													
TOTAL	**1**	**2**	**1**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	8
F03													0
F04													0
F05			1										1
F06													0
F07													0
F08													0
F09	1												1
F10					1		1						2
F11					1								1
F12		2					1						3
FRANKFORD HIGH LEVEL 14 UNITS													
TOTAL	**0**	**4**	**1**	**4**	**1**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	13
T01				1									1
T03				2				1					3
T04		2		1			1						4

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL 9 UNITS													
TOTAL	**2**	**2**	**2**	**5**	**20**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	35
D17		2			3		1						6
D18					3								3
D19					1		1						2
D20			1		1		2						4
D21	1		1	1	12								15
D22													0
D23				3									3
D24													0
D25	1			1									2
LOWER DELAWARE LOW LEVEL 32 UNITS													
TOTAL	**8**	**8**	**19**	**20**	**11**	**0**	**36**	**2**	**0**	**0**	**0**	**0**	104
D37	1	2	1		1		3						8
D38			1				1						2
D39			2	1			12						15
D40			1				1						2
D41				1									1
D42													0
D43			1										1
D44			1	12			1	1					15
D45	1		1	1	1		1						5
D46		1	1	1									3
D47													0
D48			1				1						2
D49			1				2						3
D50		1											1
D51							2						2
D52							1						1
D53													0
D54							1						1
D58			1				2	1					4
D61							1						1
D62					1		2						3
D63			1		1								2
D64			1		1								2
D65					1		1						2
D66	1		1		1		1						4
D67	1	1	3				1						6
D68	1	1		2	1		1						6
D69	1												1
D70	1												1
D71	1			1	1								3
D72		1	1										2
D73		1		1	2								4
D75							1						1

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
CENTRAL SCHUYLKILL EAST SIDE 18 UNITS															
TOTAL	**97**	**76**	**90**	**82**	**70**	**116**	**96**	**0**	**0**	**0**	**0**	**0**	**627**	**5.0**	**6.4**
S05	6	5	5	5	2	6	5						34	4.9	6.3
S06	6	5	5	5	3	5	5						34	4.9	6.3
S07	6	5	5	5	3	6	5						35	5.0	6.1
S08	7	5	5	5	4	6	5						37	5.3	5.8
S09	6	5	5	5	4	5	6						36	5.1	5.9
S10	7	4	4	5	4	5	5						34	4.9	6.3
S12	6	4	7	5	6	15	12						55	7.9	3.9
S12A	6	4	6	5	6	13	11						51	7.3	4.2
S13	6	3	7	4	4	6	7						37	5.3	5.8
S15	5	5	6	6	6	10	6						44	6.3	4.8
S16	5	5	4	4	4	4	4						30	4.3	7.1
S17	4	5	4	4	3	4	4						28	4.0	7.6
S18	4	5	4	4	4	5	4						30	4.3	7.1
S19	5	2	5	4	5	7	4						32	4.6	6.7
S21	4	4	6	4	3	6	4						31	4.4	6.9
S23	4	4	4	4	3	5	3						27	3.9	7.9
S25	5	3	4	4	3	3	3						25	3.6	8.5
S26	5	3	4	4	3	5	3						27	3.9	7.9
LOWER SCHUYLKILL EAST SIDE 9 UNITS															
TOTAL	**42**	**21**	**19**	**23**	**20**	**25**	**23**	**0**	**0**	**0**	**0**	**0**	**173**	**2.7**	**11.6**
S31	5	3	2	3	3	4	4						24	3.4	8.9
S35	5	3	3	3	4	4	4						26	3.7	8.2
S36	4	2	2	2	2	2	1						15	2.1	14.2
S36A	5	2	2	2	2	4	3						20	2.9	10.6
S37	4	2	2	2	2	1	1						14	2.0	15.2
S42	5	2	2	3	2	3	3						20	2.9	10.6
S42A	5	3	2	3	1	4	3						21	3.0	10.1
S44	4	2	2	2	2	1	1						14	2.0	15.2
S46	5	2	2	3	2	2	3						19	2.7	11.2
CENTRAL SCHUYLKILL WEST 9 UNITS															
TOTAL	**36**	**45**	**13**	**38**	**28**	**27**	**40**	**0**	**0**	**0**	**0**	**0**	**227**	**3.6**	**8.5**
S01	4	5	2	4	3	4	4						26	3.7	8.2
S02	4	5	2	4	3	4	4						26	3.7	8.2
S03	4	5	1	4	3	3	4						24	3.4	8.9
S04	4	5	1	5	4	4	4						27	3.9	7.9
S11	4	5	1	5	3	2	4						24	3.4	8.9
S14	4	5	1	4	3	2	4						23	3.3	9.3
S20	4	5	1	4	3	2	4						23	3.3	9.3
S22	4	5	2	4	3	3	6						27	3.9	7.9
S24	4	5	2	4	3	3	6						27	3.9	7.9
SOUTHWEST MAIN GRAVITY 10 UNITS															
TOTAL	**53**	**59**	**33**	**44**	**47**	**47**	**56**	**0**	**0**	**0**	**0**	**0**	**339**	**4.8**	**8.5**
S27	4	5	2	3	3	4	4						25	3.6	8.5
S28	4	5	2	3	3	4	4						25	3.6	8.5

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
COBBS CREEK HIGH LEVEL 23 UNITS															
TOTAL	**74**	**70**	**69**	**74**	**54**	**56**	**94**	**0**	**0**	**0**	**0**	**0**	**491**	**3.0**	**10.0**
C01	3	3	3	3	2	3	4						21	3.0	10.1
C02	3	3	3	3	3	3	4						22	3.1	9.7
C04	3	3	3	3	2	2	4						20	2.9	10.6
C04A	3	3	3	3	2	2	4						20	2.9	10.6
C05	3	3	3	3	2	7	4						25	3.6	8.5
C06	3	3	3	4	5	2	4						24	3.4	8.9
C07	3	3	3	4	3	2	4						22	3.1	9.7
C09	4	3	3	2	4	2	5						23	3.3	9.3
C10	3	3	3	2	2	2	5						20	2.9	10.6
C11	3	4	3	2	2	2	4						20	2.9	10.6
C12	3	3	3	2	2	1	4						18	2.6	11.8
C13	4	3	3	2	2	1	4						19	2.7	11.2
C14	3	3	3	3	2	3	4						21	3.0	10.1
C15	3	3	3	3	2	2	4						20	2.9	10.6
C16	3	3	3	3	2	2	4						20	2.9	10.6
C17	3	3	3	3	1	2	4						19	2.7	11.2
C31	5	3	3	4	2	2	4						23	3.3	9.3
C32	2	3	3	4	2	2	4						20	2.9	10.6
C33	4	3	3	4	4	3	4						25	3.6	8.5
C34	4	3	3	4	2	2	4						22	3.1	9.7
C35	3	3	3	5	2	2	4						22	3.1	9.7
C36	3	3	3	4	2	5	4						24	3.4	8.9
C37	3	3	3	4	2	2	4						21	3.0	10.1
TOTAL	**39**	**39**	**31**	**39**	**19**	**27**	**39**	**0**	**0**	**0**	**0**	**0**	**233**	**2.6**	**11.9**
C18	3	3	3	3	3	2	3						20	2.9	10.6
C19	3	3	3	3	2	2	3						19	2.7	11.2
C20	3	3	3	3	2	2	3						19	2.7	11.2
C21	3	3	2	3	2	2	3						18	2.6	11.8
C22	3	3	2	3	1	2	3						17	2.4	12.5
C23	3	3	2	3	2	2	3						18	2.6	11.8
C24	3	3	2	3	1	3	3						18	2.6	11.8
C25	3	3	2	3	1	2	3						17	2.4	12.5
C26	3	3	2	3	1	2	3						17	2.4	12.5
C27	3	3	5	3	1	2	3						20	2.9	10.6
C28A	4	3	2	3	1	2	3						18	2.6	11.8
C29	3	3	2	3	1	2	3						17	2.4	12.5
C30	2	3	1	3	1	2	3						15	2.1	14.2
TOTAL	361	324	275	320	260	325	372	0	0	0	0	0	2237		
I /D/C	4.0	3.6	3.0	3.5	2.8	3.6	4.1	0.0	0.0	0.0	0.0	0.0			

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE 18 UNITS													
TOTAL	**0**	**0**	**0**	**1**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
S05													0
S06													0
S07													0
S08													0
S09													0
S10													0
S12				1	1	1							3
S12A													0
S13													0
S15													0
S16													0
S17													0
S18													0
S19					1								1
S21													0
S23													0
S25													0
S26													0
LOWER SCHUYLKILL EAST SIDE 9 UNITS													
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
S31													0
S35													0
S36													0
S36A													0
S37													0
S42													0
S42A													0
S44													0
S46													0
CENTRAL SCHUYLKILL WEST 9 UNITS													
TOTAL	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**
S01		1											1
S02													0
S03							1						1
S04													0
S11													0
S14													0
S20													0
S22													0
S24													0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
S27													0
S28													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL 23 UNITS													
TOTAL	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**3**
C01													0
C02													0
C04													0
C04A													0
C05													0
C06				2									2
C07													0
C09							1						1
C10													0
C11													0
C12													0
C13													0
C14													0
C15													0
C16													0
C17													0
C31													0
C32													0
C33													0
C34													0
C35													0
C36													0
C37													0
COBBS CREEK LOW LEVEL 13 UNITS													
TOTAL	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
C18													0
C19	1												1
C20													0
C21													0
C22													0
C23													0
C24													0
C25													0
C26													0
C27													0
C28A													0
C29													0
C30													0
TOTAL DISC	1	1	0	3	2	1	2	0	0	0	0	0	10
NO OF UNITS IN DISTRICT BLOCKED													
CSE	0	0	0	1	2	1	0	0	0	0	0	0	4
LSE	0	0	0	0	0	0	0	0	0	0	0	0	0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE — 18 UNITS													
TOTAL	**6**	**10**	**19**	**11**	**15**	**0**	**23**	**1**	**0**	**0**	**0**	**0**	**85**
S05			2	1	1		1						5
S06				1	1		1						3
S07			1	1			1						3
S08	1	1	2	1	1		1						7
S09			1		1								2
S10													0
S12			2	1	1		3						7
S12A			1		2		3						6
S13			6				1						7
S15	1	1			2		2						6
S16	1	1			1		2						5
S17		1					1						2
S18		2	1				2						5
S19	1	1	2		3		2						9
S21			1		2		1	1					5
S23	2	1		4			1						8
S25		1		1			1						3
S26		1		1									2
LOWER SCHUYLKILL EAST SIDE — 9 UNITS													
TOTAL	**0**	**1**	**1**	**4**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**10**
S31			1	2			1						4
S35													0
S36													0
S36A				1			1						2
S37													0
S42													0
S42A				1									1
S44													0
S46		1			1		1						3
CENTRAL SCHUYLKILL WEST — 9 UNITS													
TOTAL	**0**	**1**	**0**	**4**	**4**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**14**
S01		1			1								2
S02													0
S03							1						1
S04				1			1	1					3
S11							1						1
S14				1	1								2
S20													0
S22				1	2								3
S24				1				1					2
SOUTHWEST MAIN GRAVITY — 10 UNITS													
TOTAL	**12**	**20**	**18**	**21**	**26**	**0**	**23**	**2**	**0**	**0**	**0**	**0**	**122**
S27					2								2
S28					1			1					2

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL — 23 UNITS													
TOTAL	**1**	**0**	**0**	**4**	**5**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**15**
C01													0
C02							1						1
C04													0
C04A													0
C05													0
C06				3									3
C07					1								1
C09					1		1						2
C10													0
C11													0
C12													0
C13													0
C14							1						1
C15													0
C16								1					1
C17	1												1
C31				1									1
C32													0
C33					2								2
C34													0
C35					1		1						2
C36													0
C37													0
COBBS CREEK LOW LEVEL — 13 UNITS													
TOTAL	**2**	**2**	**1**	**2**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**10**
C18	1			1									2
C19	1						1						2
C20				1	1								2
C21					1								1
C22													0
C23													0
C24		1											1
C25													0
C26													0
C27		1	1										2
C28A													0
C29													0
C30													0
TOTAL	22	34	45	57	56	0	65	6	0	0	0	0	285

JANUARY 2002 RELIEF SEWER MONTHLY INSPECTION

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
	THOMAS RUN RELIEF SEWER							6 UNITS					
R1	2	2	2	2	2	2	3						15
R2	2	2	2	2	2	2	3						15
R3	2	2	2	2	2	2	3						15
R4	2	2	2	2	2	2	3						15
R5	2	2	2	2	2	2	3						15
R6	2	2	2	2	2	2	3						15
	MAIN RELIEF SEWER							7 UNITS					
R7	2	2	2	2	2	2	3						15
R8	2	2	1	2	2	2	3						14
R9	2	2	1	2	2	2	3						14
R10	2	2	1	2	2	2	3						14
R11	2	2	1	2	2	2	3						14
R11A	2	2	1	2	2	2	3						14
R12	2	2	1	2	2	2	2						13
	WAKLING RELIEF SEWER							2 UNITS					
R13	1	2	1	3	1	2	2						12
R14	1	2	1	3	1	2	2						12
	ROCK RUN STORM FLOOD RELIEF SEWER							1 UNITS					
R15	5	9	5	3	3	4	2						31
	OREGON AVE RELIEF SEWER							2 UNITS					
R16	3	2	3	5	3	3	3						22
R17	3	2	3	5	3	3	3						22
	FRANKFORD HIGH LEVEL RELIEF SEWER							1 UNITS					
R18	1	2	2	2	3	2	1						13
	32ND ST RELIEF SEWER							1 UNITS					
R19	1	2	1	2	2	2	2						12
	MAIN STREET RELIEF SEWER							1 UNITS					
R20	1	2	1	2	1	2	2						11
	SOMERSET SYSTEM DIVERSION CHAMBER							1 UNITS					
R21	1	2	1	2	2	2	2						12
	TEMPORARY REGULATOR CHAMBER							1 UNITS					
R22													0
R23	1	2	1	2	2	2	2						12
	ARCH ST RELIEF SEWER							1 UNITS					
R24	2	2	2	2	2	2	2						14
	16TH & SNYDER							1 UNITS					
R25	2	2	2	2	2	1	2						13
	GRANT & STATE RD. RELIEF							1 UNITS					
R26	2	2	2	2	1	1	2						12
TOTAL	50	59	45	61	52	54	65	0	0	0	0	0	386
AVER	1.9	2.2	1.7	2.3	1.9	2.0	2.4	0.0	0.0	0.0	0.0	0.0	2.0

RELIEF SEWER MONTHLY DISCHARGE PAGE 7

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
	THOMAS RUN RELIEF SEWER							6 UNITS					
R1													0
R2													0
R3													0
R4													0
R5													0
R6													0
	MAIN RELIEF SEWER							7 UNITS					
R7													0
R8													0
R9													0
R10													0
R11													0
R11A													0
R12													0
	WAKLING RELIEF SEWER							2 UNITS					
R13													0
R14													0
	ROCK RUN STORM FLOOD RELIEF SEWER							1 UNITS					
R15													0
	OREGON AVE RELIEF SEWER							2 UNITS					
R16													0
R17													0
	FRANKFORD HIGH LEVEL RELIEF SEWER							1 UNITS					
R18													0
	32ND ST RELIEF SEWER							1 UNITS					
R19													0
	MAIN STREET RELIEF SEWER							1 UNITS					
R20													0
	SOMERSET SYSTEM DIVERSION CHAMBER							1 UNITS					
R21													0
	TEMPORARY REGULATOR CHAMBER							1 UNITS					
R22													0
R23													0
	ARCH ST RELIEF SEWER							1 UNITS					
R24													0
	16TH & SNYDER							1 UNITS					
R24													0
	GRANT & STATE RD. RELIEF							1 UNITS					
R26													0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
UNITS	0	0	0	0	0	0	0	0	0	0	0	0	

JANUARY 2002 RELIEF SEWER MONTHLY BLOCKS CLEARED

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
	THOMAS RUN RELIEF SEWER							6	UNITS				
R1													0
R2													0
R3													0
R4													0
R5													0
R6													0
	MAIN RELIEF SEWER							7	UNITS				
R7													0
R8							1						1
R9													0
R10													0
R11													0
R11A													0
R12													0
	WAKLING RELIEF SEWER							2	UNITS				
R13													0
R14													0
	ROCK RUN STORM FLOOD RELIEF SEWER							1	UNITS				
R15													0
	OREGON AVE RELIEF SEWER							2	UNITS				
R16													0
R17													0
	FRANKFORD HIGH LEVEL RELIEF SEWER							1	UNITS				
R18			1										1
	32ND ST RELIEF SEWER							1	UNITS				
R19													0
	MAIN STREET RELIEF SEWER							1	UNITS				
R20													0
	SOMERSET SYSTEM DIVERSION CHAMBER							1	UNITS				
R21													0
	TEMPORARY REGULATOR CHAMBER							1	UNITS				
R22						DISCONTINUED PROBLEM CORRECTED								0
R23													0
	ARCH ST RELIEF SEWER							1	UNITS				
R24													0
	16TH & SNYDER							1	UNITS				
R25													0
	GRANT & STATE RD. RELIEF							1	UNITS				
R26													0
TOTAL	0	0	1	0	0	0	1	0	0	0	0	0	2
AVER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FY2002 Dry Weather Discharges To Date

Discharge Observed		Discharge Stopped		Last Inspection						
Date	Time	Date	Time	Date	Time	Site ID	Collector	Type Unit	Location	Comment
10/13/01	08:55 AM	10/13/01	09:35 AM	10/05/01	-------	C-06	CCHL	SLOT	Lebanon Ave. & 68th St.	Connecting pipe became blocked with grit.
10/22/01	12:11 PM	10/22/01	01:00 PM	10/15/01	-------	S-12	CSES	SLOT	24th St. N of Chestnut St. Bridge	The connecting pipe was blocked with debris and waste.
10/22/01	02:15 PM	10/22/01	02:40 PM	10/13/01	-------	C-06	CCHL	SLOT	Lebanon Ave. & 68th St.	Slot box was blocked with trash and rags.
10/29/01	11:35 AM	10/29/01	12:30 PM	10/19/01	-------	T-03	FHL	SLOT	Champlost Ave. W of Tacony Creek.	Slot box was blocked with grit and debris.
10/31/01	09:00 AM	10/31/01	10:10 AM	10/29/01	-------	D-02	UDLL	CC-S	Cottman St. SE of Milnor St.	A car tire and tree limbs were jammed in the SWO gate preventing it from closing fully.
11/01/01	11:30 AM	11/01/01	12:10 PM	10/19/01	01:40 PM	P-03	PP	SLOT	Torresdale Ave., NW of Pennypack St.	Mouth of the slot regulator was blocked with grit and debris.
11/06/01	11:16 AM	11/06/01	12:27 PM	10/26/01	11:30 AM	S-12	CSES	SLOT	24th St. N of Chestnut St. Bridge	Grease accumulation in slot and connecting pipe caused a backup. PWD Ind. Waste Unit is investigating the source.
11/07/01	12:45 PM	11/07/01	03:00 PM	10/29/01	09:30 AM	S-19	CSES	B & B	Lombard St. W of 27th St.	DWO connecting pipe was blocked with unknown debris.
11/10/01	11:15 AM	11/10/01	12:25 PM	10/08/01	12:00 PM	T-10	FHL	SLOT	Roosevelt Blvd. E of Tacony Creek.	12" connecting pipe was blocked with Styrofoam.
12/03/01	01:35 PM	12/03/01	02:15 PM	11/26/01	09:40 AM	S-12	CSES	SLOT	24th St. N of Chestnut St. Bridge	Accumulation of grease in DWO connecting pipe caused a blockage. IWU is still investigating source of this grease. PWD has scheduled line flushing once a week until problem is rectified.
01/10/02	02:38 PM	01/10/02	03:50 PM	01/09/02	11:45 AM	D-58	LDLL	B & B	South St. & Delaware Ave.	Connecting pipe was blocked with grease and debris.
01/17/02	11:40 AM	01/17/02	01:00 PM	01/09/02	11:25 AM	C-09	CCHL	SLOT	64th St. & Cobbs Creek.	A broom stick and rags accumulated in the slot causing a discharge.
01/28/02	11:30 AM	01/28/02	12:30 PM	01/23/02	01:35 PM	S-03	CSW	SLOT	Spring Garden St. W of Schuylkill Exp.	The slot mouth became blocked with debris.
01/28/02	01:40 PM	01/28/02	02:30 PM	01/25/02	09:15 AM	T-13	FHL	SLOT	Whitaker Ave. W of Tacony Creek.	Leaves and tree branched were blocking slot.

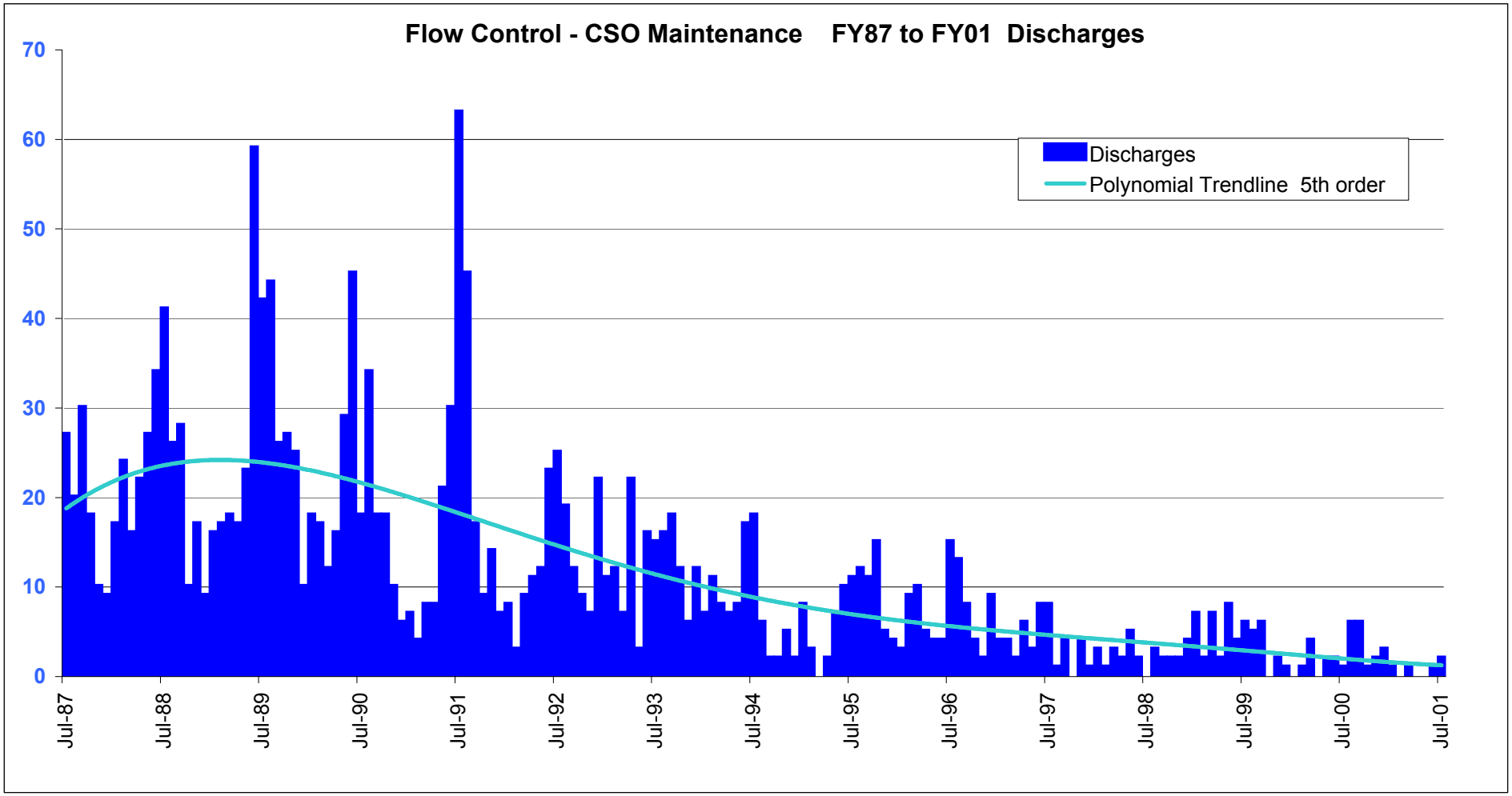
FY 2002 - CSO Regulator and Tide Gate - Comprehensive Maintenance Completion Dates

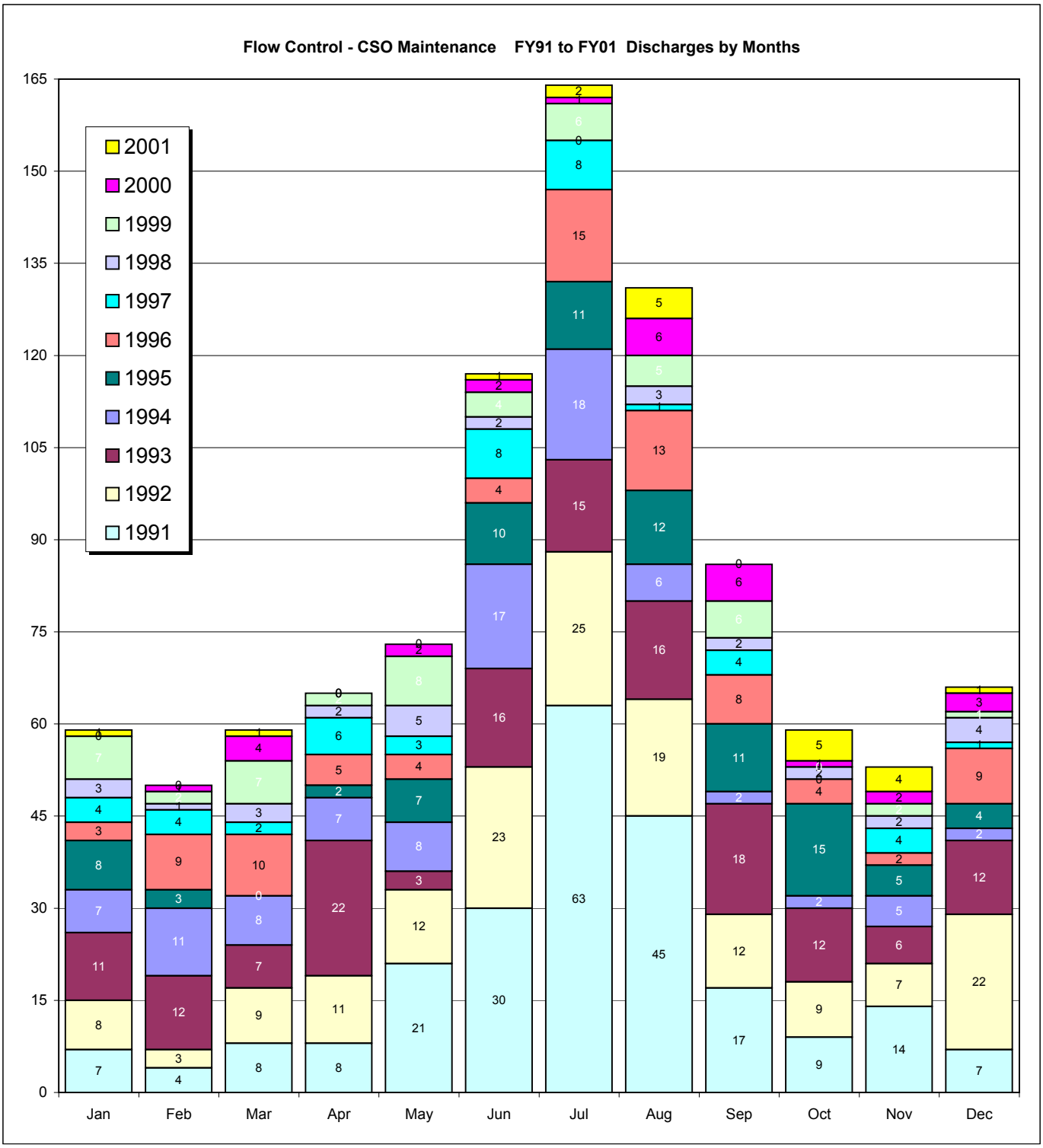
SITE ID	REG PM DATE	TG PM DATE
	UPPER PENNYPACK	
P01		
P02		
P03		
P04		
P05		
	UPPER DELAWARE LOW LEVEL	
D02		
D03		
D04		
D05		
D06		
D07		
D08		
D09		
D11		
D12		
D13		
D15		
	LOWER FRANKFORD CREEK	
F13		11/06/01
F14		
F21		
F23		
F24		
F25		
	LOWER FRANKFORD LOW LEVEL	
F03		
F04		
F05		
F06		
F07		
F08		
F09		
F10		
F11		
F12		
	FRANKFORD HIGH LEVEL	
T01		
T03		
T04		
T05		
T06		
T07		
T08		

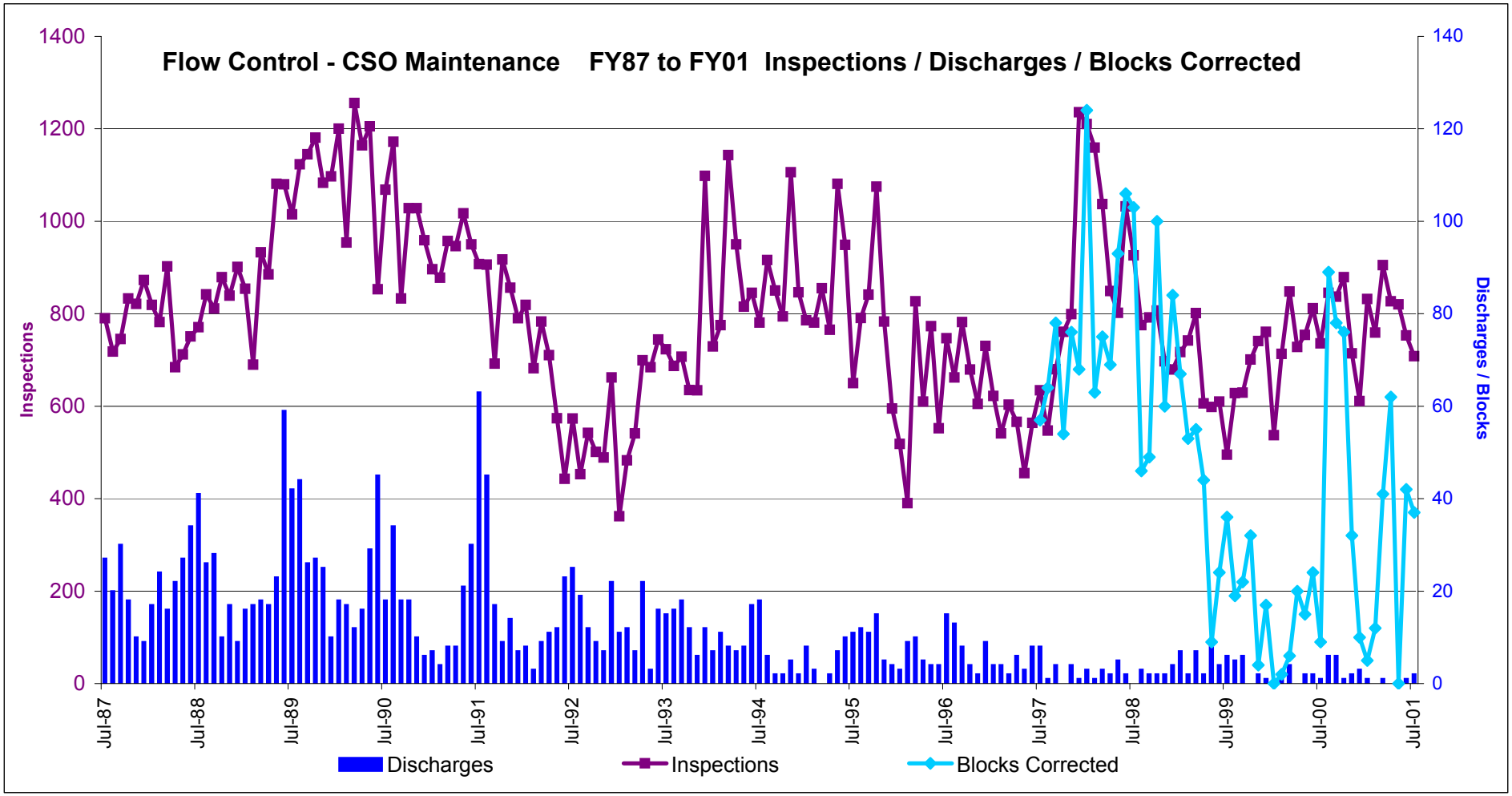
SITE ID	REG PM DATE	TG PM DATE
	SOMERSET LOW LEVEL	
D17		
D18		
D19		
D20	12/28/01	
D21	07/23/01	07/23/01
D22		
D23		
D24		
D25		05/11/01
	LOWER DELAWARE LOW LEVEL	
D37		01/04/02
D38	01/05/02	
D39	08/16/01	09/04/01
D40		
D41		
D42		
D43		
D44	01/03/02	01/03/02
D45	01/03/02	01/03/02
D46		
D47	12/08/01	
D48	12/08/01	
D49	12/15/01	
D50		
D51		
D52		
D53		
D54		
D58	01/11/02	
D61	01/19/02	
D62	01/19/02	
D63		
D64		07/21/01
D65		
D66		
D67		
D68	12/28/01	01/05/02
D69		
D70		
D71		
D72		
D73		

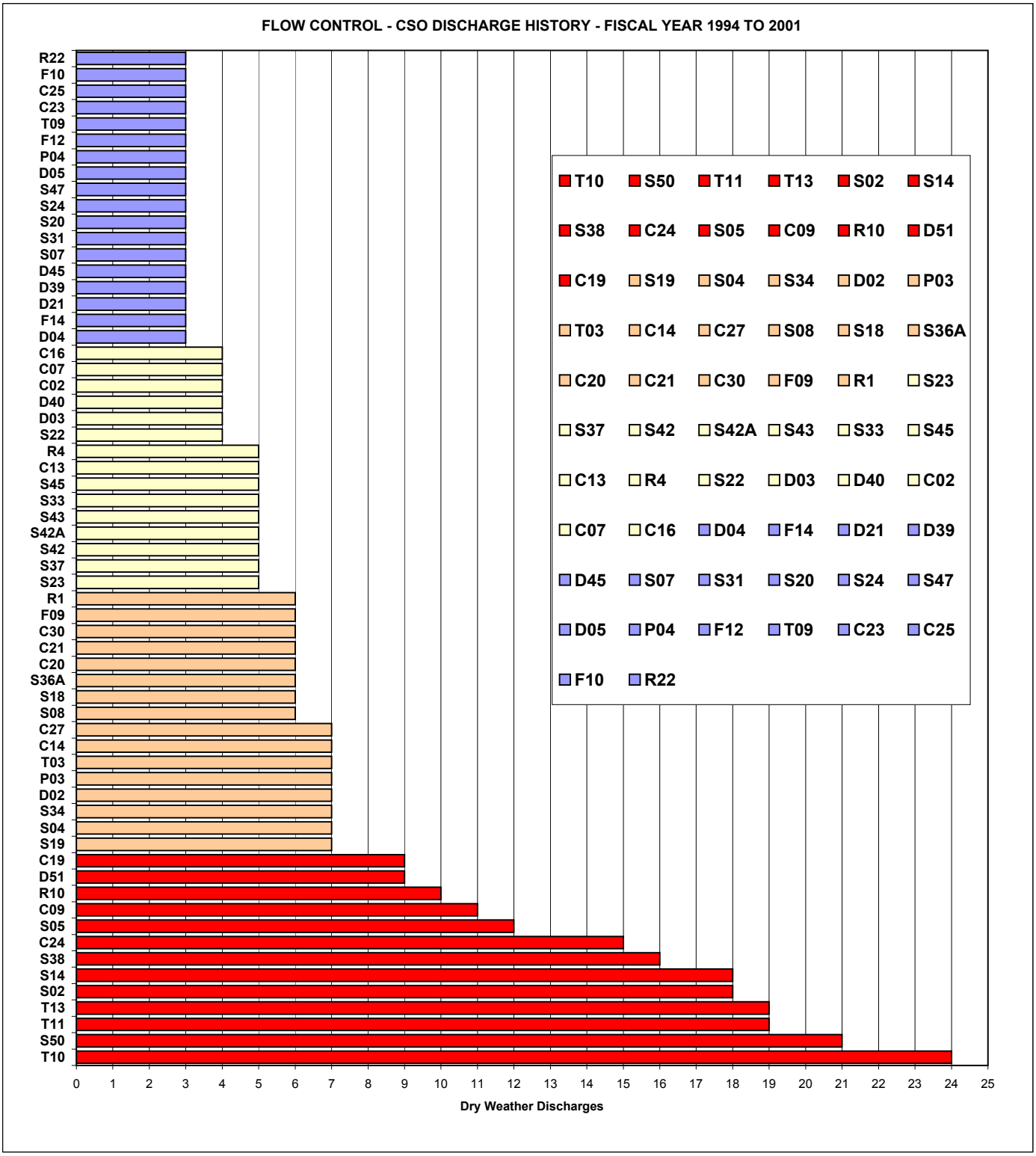
SITE ID	REG PM DATE	TG PM DATE
	CENTRAL SCHUYLKILL EAST SIDE	
S05		
S06		
S07		
S08		
S09		
S10		
S12		
S12A		
S13		
S15	11/28/01	11/28/01
S16	12/08/01	
S17		
S18	12/08/01	
S19	08/15/01	01/15/02
S21		
S23	02/13/02	
S25	02/13/02	
S26		
	LOWER SCHUYLKILL EAST SIDE	
S31		
S35		
S36		
S36A		
S37		
S42		
S42A		
S44		
S46	07/20/01	
	CENTRAL SCHUYLKILL WEST	
S01	12/22/01	
S02		
S03		
S04		
S11		
S14		
S20		
S22		
S24		03/04/02
	SOUTHWEST MAIN GRAVITY	
S27		
S28		
S30		
S34		
S39		

SITE ID	REG PM DATE	TG PM DATE
	COBBS CREEK HIGH LEVEL	
C01		
C02		
C04		
C04A	12/28/01	
C05		
C06		
C07		
C09		
C10		
C11		
C12		
C13		
C14		
C15		
C16		
C17		
C31		
C32		
C33		
C34		
C35	12/08/01	
C36	12/08/01	
C37	12/15/01	
	COBBS CREEK LOW LEVEL	
C18		
C19		
C20		
C21		
C22		
C23		
C24		
C25		
C26		
C27		
C28A		
C29		
C30	12/28/01	


Flow Control - CSO Maintenance FY87 to FY01 Discharges
70
60
50
40
30
20
10
0
Jul-87
Jul-88
Jul-89
Jul-90
Jul-91
Jul-92
Jul-93
Jul-94
Jul-95
Jul-96
Jul-97
Jul-98
Jul-99
Jul-00
Jul-01
Discharges
Polynomial Trendline 5th order


Flow Control - CSO Maintenance FY91 to FY01 Discharges by Months
2001
2000
1999
1998
1997
1996
1995
1994
1993
1992
1991
0
15
30
45
60
75
90
105
120
135
150
165
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Flow Control - CSO Maintenance FY87 to FY01 Inspections / Discharges / Blocks Corrected
Inspections
Discharges / Blocks
1400
1200
1000
800
600
400
200
0
140
120
100
80
60
40
20
0
Jul-87
Jul-88
Jul-89
Jul-90
Jul-91
Jul-92
Jul-93
Jul-94
Jul-95
Jul-96
Jul-97
Jul-98
Jul-99
Jul-00
Jul-01
Discharges
Inspections
Blocks Corrected


FLOW CONTROL - CSO DISCHARGE HISTORY - FISCAL YEAR 1994 TO 2001
R22
F10
C25
C23
T09
F12
P04
D05
S47
S24
S20
S31
S07
D45
D39
D21
F14
D04
C16
C07
C02
D40
D03
S22
R4
C13
S45
S33
S43
S42A
S42
S37
S23
R1
F09
C30
C21
C20
S36A
S18
S08
C27
C14
T03
P03
D02
S34
S04
S19
C19
D51
R10
C09
S05
C24
S38
S14
S02
T13
T11
S50
T10
T10 S50 T11 T13 S02 S14
S38 C24 S05 C09 R10 D51
C19 S19 S04 S34 D02 P03
T03 C14 C27 S08 S18 S36A
C20 C21 C30 F09 R1 S23
S37 S42 S42A S43 S33 S45
C13 R4 S22 D03 D40 C02
C07 C16 D04 F14 D21 D39
D45 S07 S31 S20 S24 S47
D05 P04 F12 T09 C23 C25
F10 R22
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Dry Weather Discharges

T-04 FLOATABLES CONTROL - MAINTENANCE COST - 1997 / 2001

Servicing of the debris net at the T-04 regulator is approximately 1 hours work.
This includes a 2 man crew from Inlet Cleaning to remove the bags and dump the debris
and a 2 man crew from Flow Control to install new nets. Each replacement costs roughly $384.70

Net cost for 2 nets	$110.00
Crew cost	$270.85
Disposal cost	$3.85
Total per Job	$384.70
Roughly 9 times per Yr.	$3,462.32

Total Crew Cost	**$270.85**
Combo, hourly cost	$31.95
Utility Large, hourly cost	$15.38
Total cost	$47.33
* from Unified Indirect Cost Plan 1996	
Flow Control labor / Hr.	$15.07
x's 2 workers	$30.14
Inlet Cleaning labor / Hr.	$12.87
x's 2 workers	$25.74
Total Man Hour cost	$55.88
Man Hour cost	$55.88
Unified Indirect cost percent markup	300.00%
Total Labor cost	$223.52

Disposal cost	**$3.85**
Debris disposal cost / ton	$53.40
Debris disposal cost / lb.	$0.03
average weight lbs.	144.26

REPLACEMENT HISTORY	
Date Replaced	Total weight 2 bags
04/24/97	75
05/08/97	150
06/06/97	200
07/18/97	200
08/19/97	150
10/02/97	75
11/19/97	75
12/27/97	90
03/06/98	100
07/08/98	125
08/13/98	150
09/04/98	150
11/18/98	150
01/20/99	225
04/07/99	175
06/02/99	100
06/15/99	75
08/10/00	265
09/11/00	115
10/12/00	160
03/08/00	150
04/06/00	250
06/09/00	130
07/05/00	Net lost
11/01/00	100
02/21/01	275
03/13/01	Net lost
04/05/01	135
06/05/01	235
07/20/01	105
08/23/01	185
10/04/01	155
01/03/02	240
02/13/02	140
TOTAL	**4905**

Appendix B – Flow Control Pumping Station Maintenance Summaries

PWD FLOW CONTROL

PUMPING STATION MAINTENANCE

CALENDAR YEAR 2001

CALENDAR YEAR 2001

FLOW CONTROL - WASTEWATER PUMPING UNIT

OUTLYING PUMPING STATION - CAPACITIES

There are thirteen outlying wastewater pumping stations maintained by PWD that pump to the three Water Pollution Control Plants . Listed below are the station capacities maximum flows and general condition.

WASTEWATER PUMPING STATION	NO. PUMPS IN STATION	RATED CAPACITY PER PUMP GPM	ACTUAL STATION CAPACITY GPM	MAXIMUM INFLOW PERIOD GPM	WPC PLANT FLOW DESTINATION	GENERAL CONDITION
BANK STREET	2	250 GPM @28FT TDH	496	49	SEWPC	Good, rebuilt in 1994 One pump rebuilt in 2001
BELFRY DRIVE	2	150 GPM @75FT TDH	389	71	SWWPC	Good, built 1978 One pump rebuilt in 2000 One pump rebuilt in 1998
C.S.P.S. VARIABLE SPEED UNIT CONSTANT SPEED UNIT	 4 2	 29000 GPM @50FT TDH 29000 GPM @50FT TDH	135,417	135,417	SWWPC	Good, station was fully automated in Oct.. 1996. One pump rebuilt in 2002 Two pumps rebuilt in 1997 One pump rebuilt in 1998 Two pumps rebuilt in 1999
FORD ROAD	2	900 GPM @83FT TDH	1,467	148	SWWPC	Excellent, station completely One pump rebuilt in 2000 One pump rebuilt in 2001
HOG ISLAND ROAD	2	500 GPM @150FT TDH	927	450	SWWPC	Excellent, new facility in 1989 One pump rebuilt in 2000 One pump rebuilt in 2001
LINDEN AVENUE	2	1400 GPM @26FT TDH	2,378	179	NEWPC	Good, built in 1967 One pump rebuilt in 2001 One pump rebuilt in 2000
LOCKART STREET	2	600 GPM @60FT TDH	1,243	148	NEWPC	Good, built in 1967 One pump rebuilt in 2001 One pump rebuilt in 2001
MILNOR STREET	3	300 GPM @24FT TDH	1,096	479	NEWPC	Good, built in 1947 One pump rebuilt in 2000 One in 2001, one in 2001
NEILL DRIVE	3	1800 GPM @172FT TDH	5,568	3,712	SWWPC	Good, completely One pump rebuilt in 2000 Two pumps rebuilt 1998
POLICE ACADEMY	2	110 GPM @24FT TDH	53	22	NEWPC	Good, rebuilt in 1993 Both pumps rebuilt in 2000
RENNARD STREET	2	400 GPM @46FT TDH	329	49	NEWPC	Good, built in 1968 Two pumps rebuilt in 1999
SPRING LANE	2	120 gpm @ 95' TDH	143	2	SWWPC	Excellent - New Station in 1999
42ND STREET	3	2000 GPM @45FT TDH	5,953	5,953	SWWPC	Good, complete rehab in 1984 One pump rebuilt in 2000 Two pumps rebuilt in 1999

WASTEWATER PUMPING
FY2002 OVERHAUL SCHEDULE

REPORT FOR: FY2002

COMPLETED 10
PROGRESSING 0

9.11 AVERAGE DAYS TO OVERHAUL IN FY2001

47.3 AVERAGE DAYS TO OVERHAUL PAST YRS

START	FINISH	MAIN PUMPING UNITS			STATUS	OOS DAYS
01/07/02	02/14/02	CSPS	#	3	COMPLETE	38 DAYS
		CSPS	#	6		DAYS
10/09/01	10/18/01	LOCKART ST.	#	1	COMPLETE	9 DAYS
07/27/01	08/01/01	LOCKART ST.	#	2	COMPLETE	5 DAYS
11/13/01	11/17/01	FORD RD.	#	2	COMPLETE	4 DAYS
10/30/01	11/05/01	FORD RD.	#	1	COMPLETE	6 DAYS
11/06/01	11/16/01	HOG IS.	#	1	COMPLETE	10 DAYS
10/24/01	10/29/01	MILNOR ST.	#	1	COMPLETE	5 DAYS
10/19/01	10/23/01	MILNOR ST.	#	2	COMPLETE	4 DAYS
03/12/02	03/13/02	Navy Yard P120	#	1	COMPLETE	1 DAYS
		NEILL DR.	#	1		DAYS
09/14/01	09/26/01	Navy Yard P120	#	2	COMPLETE	13 DAYS

START	FINISH	AUXILIARY EQUIPMENT	STATUS	OOS DAYS
03/22/01	07/30/01	26th & VARE (VENT)	New Installation	130 DAYS
10/16/01	10/17/01	Mingo(heater)	Complete	2 Days
10/23/01	10/23/01	Ridge Hypo-Heater	Replacement	1 Days
10/23/01	10/23/01	Ridge Hypo-Vent	Replacement	1 Days

FLOW CONTROL UNIT

FY 2001 PUMP STATION YEARLY FLOW REPORT

WASTEWATER PUMP STATIONS	PUMP #1	PUMP #2	PUMP #3	PUMP #4	PUMP #5	PUMP #6	STATION FLOW (MG)
BANK STREET	3.995	3.914					7.909
BELFRY DRIVE	4.141	4.502					8.642
CENTRAL SCHUYLKILL	3,882.390	5,237.025	320.559	668.021	5,441.916	4,826.813	20,376.724
FORD ROAD	40.092	46.479					86.571
FORT MIFFLIN	0.021	0.000	0.000	0.025			0.025
HOG ISLAND	4.153	4.586					8.739
LINDEN AVENUE	38.750	30.760					69.511
LOCKHART STREET	33.662	31.840					65.502
MILNOR STREET	2.201	2.290	2.414				6.905
NEILL DRIVE	210.429	188.133	104.659				503.220
POLICE ACADEMY	2.193	2.065					4.257
RENNARD STREET	4.848	4.647					9.496
SPRING LANE	2.503	2.491					4.994
42ND STREET	857.489	768.883	1,050.662				2,677.035
STORMWATER PUMP STATIONS							
BROAD & BOULEVARD	14.503	67.066	0.138	0.409			82.117
MINGO CREEK	0.338	0.000	403.333	456.706	228.691	499.944	1,589.011
26TH & VARE	0.349	0.351					0.700

FLOW CONTROL UNIT

FY 2001 PUMP STATION YEARLY RUNTIME REPORT

WASTEWATER PUMP STATIONS	PUMP #1	PUMP #2	PUMP #3	PUMP #4	PUMP #5	PUMP #6	STATION RUNTIME HR
BANK STREET	256.800	275.500					532.3
BELFRY DRIVE	536.800	573.800					1,110.6
CENTRAL SCHUYLKILL							
FORD ROAD	1,017.400	1,071.300					2,088.7
FORT MIFFLIN	5.500	0.100	0.100	6.200			6.300
HOG ISLAND	149.000	154.400					303.4
LINDEN AVENUE	502.800	462.100					964.9
LOCKHART STREET	938.200	877.300					1,815.5
MILNOR STREET	94.600	88.300	103.900				286.8
NEILL DRIVE	1,774.000	1,663.800	922.000				4,359.8
POLICE ACADEMY	783.060	756.470					1,539.5
RENNARD STREET	502.000	473.900					975.9
SPRING LANE	342.170	336.790					679.0
42ND STREET	6,154.200	7,813.200	7,540.600				21,508.0
STORMWATER PUMP STATIONS							
BROAD & BOULEVARD	70.100	365.200	0.400	1.100			436.8
MINGO CREEK	0.100	0.000	119.400	135.200	67.700	148.000	470.4
26TH & VARE	5.200	4.800					10.0

PHILADELPHIA WATER DEPARTMENT			SERVICE LEVEL GOALS AND PERFORMANCE MEASURES											
DIVISION: OPERATIONS	BY: GEORGE COLLIER	NO.	RESPONSIBILITY CENTER: COLLECTOR SYSTEM - FLOW CONTROL								NO.	FUND: WATER	DATE PREPARED: FOR : FY 2001	
MAJOR SERVICE ACTIVITIES PERFORMED BY THIS DIVISION/RESPONSIBILITY CENTER														
NAME/DESCRIPTION OF SERVICE	UNIT OF MEASUREMENT (1)	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	TOTAL OR MTHLY. AVG.
FISCAL YEAR 2001 ACTUAL														
Main Wastewater Pump Availability (goal is 90% or higher)	Percent	95.7%	95.6%	94.7%	96.1%	97.7%	91.3%	97.6%	94.9%	91.9%	96.4%	99.8%	99.8%	96.0%
CSO Dry Weather Discharges (goal is less than 1)	CSO Discharges / 100 Inspections	0.1	0.7	0.7	0.1	0.3	0.5	0.1	0.0	0.1	0.0	0.0	0.1	0.2
CCTV Inspections of Sewer Infrastructure (goal - greater than 20,000 ft)	Feet	27,415	21,604	26,335	27,928	27,470	28,937	23,692	26,654	29,957	28,318	30,480	32,909	27,642

FLOW CONTROL - WW PUMPING UNIT MAIN PUMP UNIT OOS HOURS - 2001

DATE OUT	TIME OUT	DATE IN	TIME IN	UNIT	STATION	TYPE	REASON	DAYS OUT
02/09/02	12:30 PM	02/20/02	11:00 AM	2	MINGO CK	BD	SEALWATER VALVE STUCK OPEN, PUMP NOT RUNNING.	11
01/09/02	11:10 AM	01/10/02	1:50 PM	2	BROAD ST	BD	VIBRATION	1
01/07/02	9:00 AM	02/14/02	11:00 AM	3	CSPS	OV	OVERHAUL	38
12/17/01	8:39 AM	12/19/01	11:00 AM	1	BROAD ST	BD	AUTO CONTROL BAD, CHECK VALVE CLOGGED	2
11/13/01	9:00 AM	11/17/01	11:00 AM	2	FORD RD	OV	OVERHAUL	4
11/06/01	9:00 AM	11/16/01	1:00 PM	1	HOG ISLAND	OV	OVERHAUL	10
10/30/01	8:00 AM	11/05/01	2:00 PM	1	FORD RD	OV	OVERHAUL	6
10/24/01	10:00 AM	10/29/01	2:30 PM	1	MILNOR ST	OV	OVERHAUL	5
10/19/01	9:00 AM	10/23/01	2:35 PM	2	MILNOR ST	OV	OVERHAUL	4
10/09/01	10:00 AM	10/18/01	12:00 AM	1	LOCKHART ST	OV	OVERHAUL	9
08/22/01	9:00 AM	08/24/01	2:30 PM	2	NEILL DR	PM	PUMP REPLACEMENT	2
07/27/01	9:00 AM	08/03/01	3:00 PM	2	LOCKHART ST	OV	OVERHAUL PUMP	7
07/18/01	9:00 AM	07/23/01	3:00 PM	2	CSPS	PM	REPACKING PUMP, TROUBLE GETTING SHUTOFF.	5
07/14/01	9:00 AM	08/02/01	11:30 AM	5	MINGO CK	BD	NEED PRESSURE GAUGE AND SEAL WATER VALVE	19
06/17/01	9:30 AM	06/18/01	3:00 PM	4	MINGO CK	BD	SEALWATER FAILURE	1
05/22/01	2:10 PM	05/24/01	2:00 PM	5	MINGO CK	PM	UNABLE TO LOCATE OIL FOR PUMP	2
04/26/01	9:00 AM	04/27/01	2:00 PM	2	NEILL DR	PM	RE- ALIGNMENT	1
01/01/01	7:00 AM	04/23/01	12:00 AM	2	MINGO CK	OV	VARIOUS INSTRUMENTATION PARTS NEEDED	112
01/01/01	8:00 AM	04/23/01	2:15 PM	1	MINGO CK	OV	VARIOUS INSTRUMENTATION PARTS NEEDED	112
03/08/01	9:00 AM	03/17/01	7:30 AM	6	MINGO CK	PM	SEAL WATER VALVE REPLACEMENT	9
01/31/01	2:00 PM	03/23/01	12:00 PM	5	MINGO CK	BD	INSTRUMENTATION PROBLEM	51
02/28/01	9:00 AM	03/03/01	11:00 AM	1	BANK ST	OV	OVERHAUL	3
02/15/01	8:00 AM	02/22/01	3:30 PM	2	42ND ST	OV	OVERHAUL- MOTOR ONLY ,COMPLETE OVERHAUL	7
02/13/01	11:00 AM	02/14/01	3:00 PM	3	42ND ST	BD	BAD MOTOR	1
01/29/01	11:00 AM	01/31/01	2:00 PM	5	MINGO CK	BD	SEAL WATER CONTROL PROBLEM (INST)	2
01/18/01	8:00 AM	01/24/01	2:00 PM	2	LINDEN AVE	OV	OVERHAUL	6
12/30/00	10:00 AM	01/24/01	11:00 AM	3	NEILL DR	BD	LEAKING OIL	25

FLOW CONTROL - SERVICE LEVEL GOAL
WASTEWATER PUMP MONTHLY AVAILABILITY