

Water Quality Management and Compliance

The Wastewater Treatment Division (WTD) manages several programs to protect and preserve water quality. RWSP reporting policies call for RWSP annual reports to include a summary of WTD's water quality management programs and its compliance with the Endangered Species Act and with other agency regulations and agreements.

An important water quality protection task is to ensure that King County's wastewater treatment plants produce effluent that meets permit requirements and water quality standards. The quality of treated effluent from the treatment plants remained high in 2008. None of the four secondary plants—including the new Carnation plant—experienced National Pollutant Discharge Elimination System (NPDES) permit effluent limit exceptions during the year. Both the South plant and West Point plant earned the National Association of Clean Water Agencies (NACWA) Gold Peak Performance Award for achieving 100 percent compliance with their NPDES permits for an entire calendar year. These two plants also received the Platinum Peak Performance Award for multiple years of consecutive gold performance.

WTD is working to reduce marine discharges of treated effluent through expansion of its reclaimed water system (Chapter 8). In addition, it recycles 100 percent of the biosolids produced at the plants and recovers methane (digester gas) to generate energy for running plant operations and for sale to local utilities.

WTD has committed to controlling all its combined sewer overflow (CSO) locations by 2030 so that they meet the Washington State standard of an average of no more than one untreated discharge per year. Almost half of the county's CSOs are controlled thus far.

The best way to protect our waterways is to control pollutants at their sources. Two programs work to prevent pollutants from reaching King County treatment plants—the King County Industrial Waste Program and the Local Hazardous Waste Management Program. Among other achievements, these programs have helped to reduce the level of mercury in biosolids by 50 percent from measured levels in 2000.

This chapter reports on WTD water quality management and compliance activities in 2008. The 2008 results of the county's water quality monitoring program are included as Appendix C.

10.1 Wastewater Treatment Plant Capacity, Flows, and NPDES Compliance

On average, WTD's four secondary treatment plants processed over 161 million gallons of wastewater each day in 2008. All four plants operated without a single violation of their NPDES permit limits, although there were some violations of the CSO treatment plant limits in the West Point permit.

10.1.1 South Treatment Plant

The South Treatment Plant provides secondary treatment for wastewater flows from customers in the lower Green River basin, suburban cities east of Lake Washington, and Seattle's Rainier Valley, in addition to flows from parts of Snohomish and Pierce Counties. South plant also treats septic tank solids from the region and sludge from treatment facilities in neighboring areas such as Vashon Island and cities in the Snoqualmie Valley.

South plant is designed to manage an average dry-weather flow of 96 million gallons per day (mgd), average wet-weather flow of 115 mgd, and instantaneous maximum flow of 325 mgd.¹ Its dual outfalls at Duwamish Head in West Seattle discharge secondary effluent into Puget Sound 10,000 feet from shore at a depth of 600 feet into the denser deeper water layer.

Despite the fluctuation of influent volume and composition, South plant's secondary treatment process consistently produces high quality secondary effluent. In 2008, the plant accepted over 19.8 million gallons of septic tank solids, 33 percent more than in 2007. The increase in volume was mainly due to the temporary closure of a local company that also accepts septic tank solids. From November 2007 through April 2008, the plant managed an average wet-weather flow of 83.43 mgd and, in 2008, processed an average monthly volume of 70 mgd. Treatment efficiency remained high and consistent. During a high-intensity storm on December 3, 2007, primary treated effluent and secondary treated effluent were blended for 21 hours to maintain the optimum plant operation and to meet permit limits.

No NPDES permit effluent limit exceptions occurred during the year; the plant earned the NACWA Gold Peak Performance Award for 2008 and its Platinum Peak Performance Award for 10 consecutive years of gold performance.

An NPDES permit renewal application for South plant will be submitted to Washington State Department of Ecology (Ecology) early in 2009.

¹ For the South, Vashon, and Carnation plants, the average wet-weather flow (AWWF) is the average flow during the wet season, between November and April, on days when no rainfall has occurred on the previous day. For the West Point plant, the "non-storm" AWWF is calculated without counting the flow on days when it rains or the days immediately following a rain event.

10.1.2 West Point Treatment Plant

The West Point Treatment Plant provides secondary treatment for wastewater from customers located in the greater Seattle area and in southwest Snohomish County. West Point is the largest plant in the King County system. This plant is designed to manage an average dry-weather flow of 110 mgd, average non-storm wet-weather flow of 133 mgd, and instantaneous maximum flow of 440 mgd. After treatment, the secondary effluent is discharged through an outfall near the plant into Puget Sound. The outfall discharges 3,650 feet from shore at a depth of 240 feet.

West Point is designed to provide secondary treatment for up to 300 mgd of wastewater. Capacity between the 300-mgd capacity for secondary treatment (defined as 2.25 times the average wet-weather flow of 133 mgd) and the 440-mgd peak capacity is used to manage captured CSO flows. After receiving CSO treatment (equivalent to primary treatment), these flows are mixed with secondary effluent for disinfection, dechlorination, and discharge. The blended effluent must meet secondary effluent quality limits, with a small reduction in total suspended solids removal requirements (from 85 to 80 percent).

From November 2007 through April 2008, the average wet-weather flow through West Point was 130.77 mgd and, in 2008, the average monthly flow was 91.5 mgd. One disinfection failure occurred during the year. The failure had no effect on surface water quality, and its cause has since been corrected. No NPDES permit effluent limit exceptions occurred; however, the county paid a fine in 2008 because of a wastewater spill into Seattle's Ravenna Creek. The spill occurred after the county diverted wastewater into the Laurelhurst Trunk to facilitate repair of a flow sensor in the Lake City Tunnel. Unknown to the county, the diversion structure had an overflow weir that allowed flow to enter a storm sewer that leads to Ravenna Creek. During a significant rain event, the flow drained into the creek and then into University Slough. Major remediation of the creek was completed, and interim plugs were inserted in the system to prevent future flow of wastewater into the creek.

An NPDES permit renewal application for West Point was submitted to Ecology on June 30, 2008. The renewed permit was scheduled to be issued on December 31, 2008. The current permit was extended beyond December 31 to allow for a public hearing in January 2009 and subsequent comment period on provisions of the draft permit. Provisions of that draft permit include the following:²

- Disinfection system improvements at the plant
- Sediment monitoring at the plant outfall, and potential toxicity identification
- Increased scrutiny of CSOs, including more stringent fecal coliform limitations for CSO treatment plants, increased monitoring at the plant and CSO facilities, more frequent CSO data reporting, and gathering and synthesis of sediment data at CSO sites
- Additional study of pollutants from selected industrial areas
- Increased receiving water monitoring.

² These and other provisions of the draft NPDES permit are subject to revision based on Ecology review and public comment before issuance of the final permit.

West Point earned the NACWA Gold Peak Performance Award for 2008 and its Platinum Peak Performance Award for six consecutive years of gold performance.

10.1.3 Vashon Treatment Plant

The Vashon Treatment Plant is designed to manage an annual average flow of 0.18 mgd, maximum monthly average flow of 0.52 mgd, and instantaneous maximum flow of 2.05 mgd. An outfall discharges 2,900 feet offshore to Puget Sound at a depth of minus 200 feet mean lower low water.³

The 2007–2008 average wet-weather flow for the Vashon plant was 0.135 mgd, and the average monthly flow in 2008 was 0.124 mgd. The plant had no permit effluent limit exceptions during the year.

WTD also owns and operates the Beulah Park/Cove Treatment Facility on Vashon Island. This facility collects wastewater from approximately 60 residences via a vacuum system and pump station; treats the wastewater with a series of septic tanks, recirculating sand filters, and ultraviolet disinfection; and then pumps the effluent to a drip field for percolation to subsurface soils. King County reports quarterly on its operation. The facility did not consistently meet pH limits during five months in 2008. Operating procedures are being modified to address the pH problem.

10.1.4 Carnation Treatment Plant

The City of Carnation collects domestic wastewater from residential and commercial users and delivers it to the new King County–owned Carnation Treatment Plant. The plant began treating the city’s wastewater on May 5, 2008.

The Carnation plant is designed to manage an average dry-weather flow of 0.21 mgd, average wet-weather flow of 0.22 mgd, and instantaneous maximum flow of 1.4 mgd. A key component of the treatment plant design is that all effluent is treated to Class A reclaimed water standards through a combination of membrane bioreactor technology and ultraviolet disinfection.⁴

The plant has a dual discharge system: (1) an outfall to the Snoqualmie River 2 feet above the riverbed near the western abutment of the Carnation Farm Road Bridge and (2) an outfall to the Chinook Bend wetland enhancement project off of NE Carnation Farm Road. The plant discharged effluent to the river in 2008 and will start discharging to the wetland in 2009. The river outfall will be used only when required by a regulatory agency for reasons such as augmenting in-river flows, when a plant upset occurs or the ultraviolet disinfection system fails, or when scheduled maintenance is being done.

³ Mean lower low water is the average lower low tidal height over a 19-year period.

⁴ “Class A Reclaimed Water” is reclaimed water that, at a minimum, is at all times an oxidized, coagulated, filtered, and disinfected wastewater. Beneficial uses of Class A reclaimed water include irrigation of food and non-food crops, irrigation of open access areas such as golf courses and parks, enhancement of natural resources such as wetlands, and industrial cooling and process water.

The average monthly flow volume from May through December 2008 was 0.087 mgd. The NPDES permit for the plant was issued on April 15, 2008, became effective on April 16, 2008, and expires April 15, 2013. The plant had no permit effluent limit exceptions in 2008.

10.2 Sanitary Sewer Overflows and Permit Deviations

Extensive resources have been committed to maintaining the integrity of the regional wastewater system and preventing sanitary sewer overflows (SSOs).⁵ WTD's Maintenance and Asset Management groups regularly inspect, maintain, and repair facilities to prevent mechanical failures. In addition, WTD regularly updates its Conveyance System Improvement Program to ensure that conveyance facilities keep pace with projected needs for increased capacity.

Five SSOs and three permit deviations occurred in 2008 (Table 10-1 and Table 10-2), a significantly lower number compared to previous years. One type of permit deviation—interruption of disinfection—occurred at the West Point plant on one occasion during 2008, down from three in 2007. Because of short-term mechanical problems at both West Point and South plants, each plant experienced one occasion where a small volume of primary treated effluent was diverted around secondary treatment and then subsequently blended with the secondary effluent prior to discharge (also considered a permit deviation). The discharged blended effluent stayed within permit limits.

While there may be some short-term risk to public health and the environment from SSOs and permit deviations, the volumes of releases do not produce long-term effects. For all SSOs, WTD implements overflow response procedures, including posting the area, cleaning up the area as appropriate, and monitoring water quality in the vicinity of the overflow to determine when pollutant concentrations have returned to levels consistent with state Water Quality Standards.

⁵ SSOs are discharges of wastewater from separated sewer systems and from combined systems when no rain is occurring. They can flow from manholes, broken pipes, or pump stations to city streets, water bodies, and basements.

Table 10-1. Sanitary Sewer Overflows in 2008

Date	Location	Estimated Volume (gallons)	Duration	Discharge Type	Receiving Water	Reason for Overflow
Mar. 4	North Creek Pump Station	10–18,000	15 minutes	Untreated wastewater	Potentially Sammamish River	A drain was inadvertently left open while the force main was being put into service.
May 29	Ravenna Drop Structure	800,000	Up to 10 days	Combined wastewater and stormwater	Ravenna Creek/University Slough	Lake City Tunnel flows were diverted to the Laurelhurst Trunk to facilitate repair of a flow sensor in the tunnel. An overflow weir and open gate allowed diverted flow to enter an unknown connection to a storm sewer. Major creek remediation was done, and plugs were inserted to prevent future flows to the creek.
Aug. 24	Ravenna Drop Structure	100,000	1 hour	Combined wastewater and stormwater	Ravenna Creek/University Slough	The plugs were removed temporarily to respond to a Washington State Department of Fish and Wildlife directive, which has since been rescinded.
Nov. 13	Beulah Park/ Cove Treatment Facility	5,700	2.5 hours	Untreated wastewater	On the ground near the facility	A treatment tank overflowed and spilled onto the ground. The area was cleaned.
Dec. 17	Juanita Bay Pump Station	~10	55 minutes	Untreated wastewater	Onto the street	A partially drained force main was accidentally punctured while a new pump station was being connected.

Table 10-2. Permit Deviations in 2008

Date	Location	Estimated Volume (gallons)	Duration	Discharge Type	Receiving Water	Reason for Permit Deviation
June 3	West Point Treatment Plant	Unknown	12 minutes	Treated wastewater; no disinfection	Puget Sound	Operator error caused a chlorinator to be unavailable. The error was quickly addressed.
Nov. 2	West Point Treatment Plant	310,000	21 minutes	Partially treated wastewater mixed with fully treated effluent	Puget Sound	An internal gate opened part way, causing primary treated effluent to bypass secondary treatment. Causes were corrected.
Nov. 7	South Treatment Plant	10,000	4–5 minutes	Partially treated wastewater mixed with fully treated effluent	Puget Sound	A gate automatically opened part way while the system was preparing to shift process modes. The problem was quickly corrected.

10.3 Combined Sewer Overflows

King County’s CSO facilities are regulated through West Point’s NPDES permit. With each permit renewal application (about every five years), WTD submits a CSO plan update to Ecology. WTD also submits a report to Ecology each year on annual CSO volumes and frequencies and on progress made to control its CSOs.⁶

Plans for controlling CSOs in King County began as early as 1979, after regional treatment plants and conveyance lines were in place. Almost 20 years of data demonstrate progress toward the control goal (Figure 10-1). As of May 2008, about 16 of King County’s 38 CSOs are controlled. Two other CSOs—part of the Mercer/Elliott West CSO control system that came online in 2005—are expected to achieve control after startup adjustments and modifications are made to the system.⁷ Control status will be confirmed in the hydraulic model recalibration that is scheduled to be ready in 2010. The remaining 20 uncontrolled CSOs will meet state standards as projects listed in the RWSP are completed between 2013 and 2030.

This section presents the volumes and frequencies of untreated and treated CSOs during the 2007–2008 wet season and the status of treatment facilities in meeting regulatory requirements during that time. See Chapter 5 for more information on the county’s CSO control program.

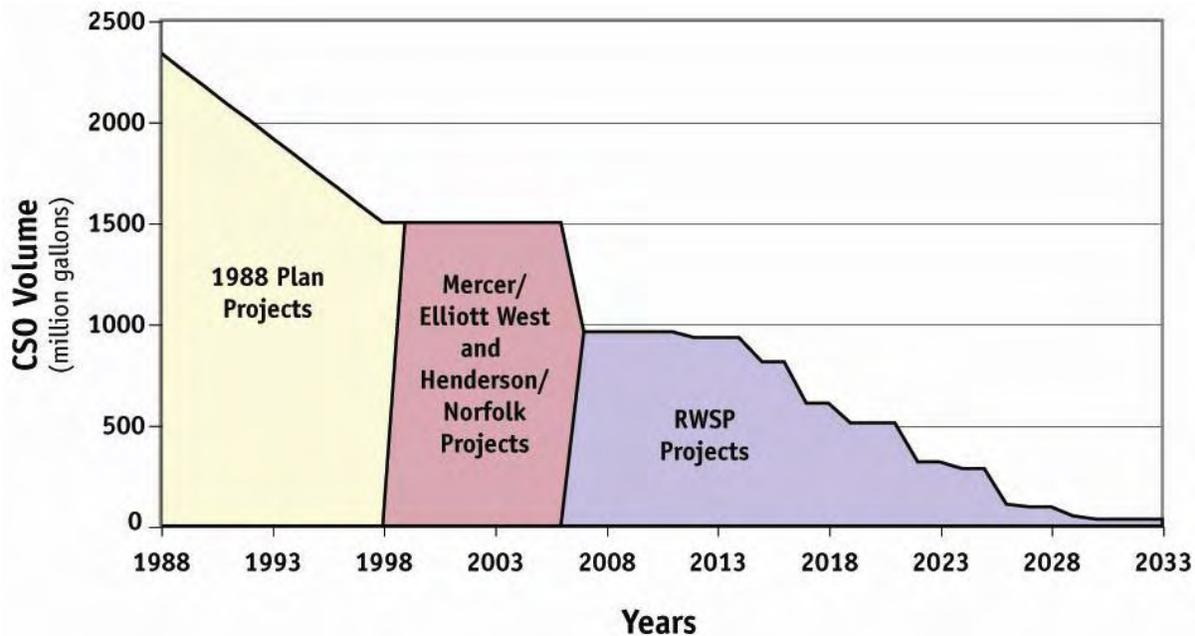


Figure 10-1. Actual and Planned CSO Reduction, 1988–2030

⁶ “Control” is defined as meeting the Washington State standard of an average of no more than one untreated discharge per year per outfall.

⁷ The two CSOs are the Denny Way and Dexter Avenue Regulator Stations.

10.3.1 Frequencies and Volumes of Untreated CSOs

King County assesses CSO data for the period from June 1 of one year through May 31 of the next year. The years 1981–1983 are used as the baseline for measuring progress toward controlling CSOs. Baseline volumes were determined using computer modeling. As shown in Figure 10-2, there is a pattern of decreasing volumes of untreated CSOs over time despite fluctuations in rainfall from year to year.⁸

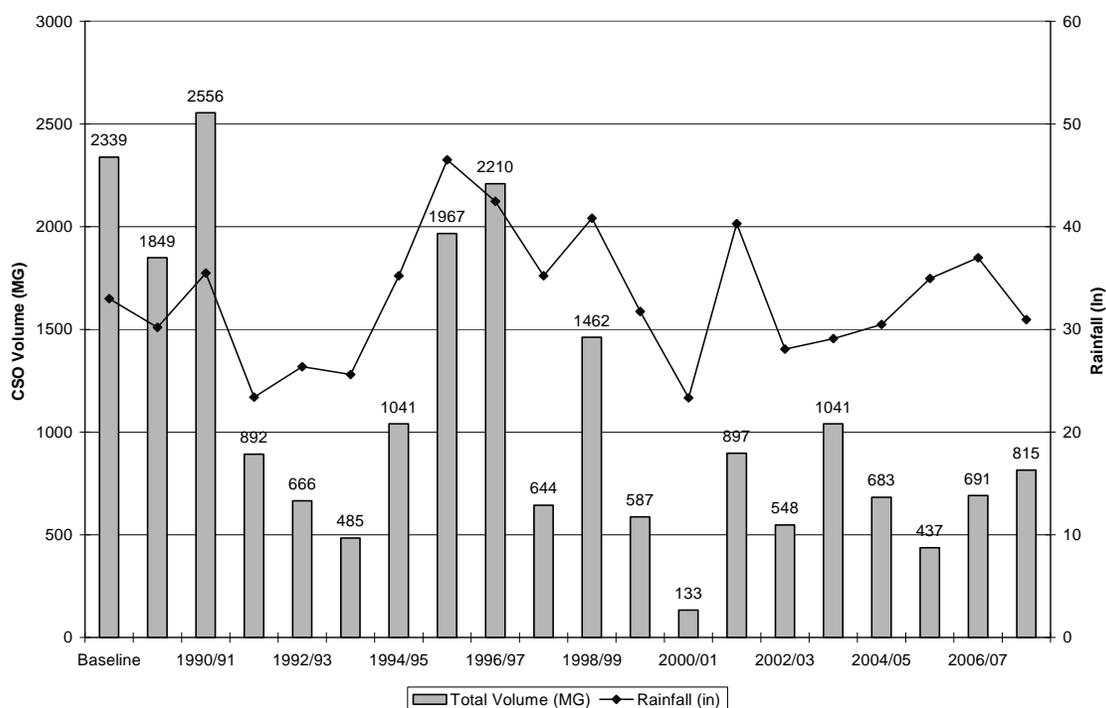


Figure 10-2. Annual CSO Volumes and Total Rainfall—1989 through 2008

In 2007–2008, a total of 87 untreated CSO events with a total discharge volume of 815.62 million gallons (MG) were recorded. These totals represent an 81.5 percent reduction in frequency over the 1981–1983 baseline of 471 events and a 65.2 percent reduction in volume over the 1981–1983 baseline of 2,339 MG.

While a reasonable relationship between annual rainfall and CSO volumes can be seen in Figure 10-2, large and/or intense storms can contribute most of the year’s CSO volume, especially if the storms cause power outages and flooding at WTD facilities. This was the case in 2007–2008, when approximately 96 percent of the annual CSO volume was related to a storm that occurred December 3, 2007. The storm brought 3.77 inches of rain for the day at SeaTac Airport, the second highest total on record in the past 50 years. Average rainfall at gauges in the Seattle area was slightly higher at 4.10 inches, with some gauges recording as much as

⁸ More information about volumes and frequencies for specific CSOs can be found in the Combined Sewer Overflow Program 2007–2008 Annual Report at http://your.kingcounty.gov/dnrp/library/wastewater/cso/docs/AnnualReport/2007-08_CSAnnual.pdf.

4.50 inches in a 24-hour period. The amount and intensity of rainfall during this storm overwhelmed most of the system.

10.3.2 Frequencies and Volumes of Treated CSOs

In 2007–2008, treated flows were discharged a total of 22 times from King County’s five CSO treatment facilities. Total discharge volume was 550.18 MG. Table 10-3 shows frequency and volume for each facility.

**Table 10-3. Frequency and Volume of Treated CSOs
June 2007–May 2008**

CSO Facility	Events ^a	Volume (million gallons)
Alki plant	1	77.80
Carkeek plant	1	35.63
Elliott West	3	188.73
Henderson/Norfolk	1	19.80
West Point CSO process	16	228.22
TOTAL	22	550.18

^a Events are defined by a 48-hour dry inter-event interval; West Point defines events in terms of days.

West Point Treatment Plant

For the 2007–2008 CSO year, there were 16 occurrences totaling 228.22 MG of treated CSO discharges from West Point.

Alki CSO Treatment Plant

The total volume of treated CSO discharged from the Alki CSO Treatment Plant was 77.80 MG; this discharge occurred during a single event in December 2007. Flows peaked over 60 mgd for most of the storm, which exceeded the capacity of the plant outfall under tidal conditions at the time. On the second day of the storm, the plant treated a record of 55 MG.

Modifications were made before the 2007–2008 season to address a flow surge that occurred in 2006–2007, to smooth out flow peaks, promote improved solids capture, and limit short circuiting of the bisulfite feed points. These problems were not experienced during the season. Further monitoring is required to gauge the success of these improvements, however, because only a single discharge occurred since they were made. The Alki plant met all its permit limits in

2007–2008 except for monthly and daily limits for chlorine residual. Improvements were made to the dechlorination system in late December 2007 to address this problem.

Carkeek CSO Treatment Plant

In the 2007–2008 wet season, the Carkeek CSO Treatment Plant operated nine times, with one discharge event totaling 35.63 MG. Pipers Creek flooded the plant during the December 2007 storm (Figure 10-3). The improved disinfection system and the new dechlorination system, both in their third year of operations, worked well in meeting the effluent fecal coliform and residual chlorine limits. All other permit limits were also met during the season.



Figure 10-3. Pipers Creek Overflowing into Carkeek CSO Plant on December 3, 2007.

Mercer/Elliott West CSO Control System

There were three discharge events in 2007–2008 from the Elliott West CSO outfall. The total discharge volume for the reporting period was 188.73 MG. During the first three years of operation, the Mercer/Elliott West CSO control system has presented several challenges. Such challenges are typical for large and complex CSO control systems. Moreover, the seasonal and intermittent operation of these facilities prolongs the commissioning period.

Hydraulic, solids management, and disinfection problems at the Elliott West CSO Treatment Facility are being identified and solutions are being implemented. In addition, the City of Seattle continues to investigate and try to remedy sources of sediments in its systems that are causing dry-weather flows to enter the Mercer Tunnel.



Despite improvements made to address these problems before the 2007–2008 season, an effluent overflow in Myrtle Edwards Park and a bacteria limit violation occurred as a result of the large December storm. Construction began in September 2008 to raise the elevation of the dechlorination and transition structures and to install new bisulfite mixing and sampling equipment to assist in meeting the chlorine discharge standards; modifications to the automatic sampling system were completed in 2008 to improve measurement of solids being captured and transported to West Point; and a contract is expected to be advertised in 2009 to improve performance of the chlorination and dechlorination systems. A final report containing recommendations for additional improvements to the facility is expected to be issued in November 2009.

Although the Mercer/Elliott West system has not yet achieved complete CSO control, it is making substantial progress toward meeting that goal. During the 2007–2008 wet season, the facilities met the total suspended solids percent removal limit for the first time. Substantial progress has also been made in controlling CSOs at the Denny and Dexter Regulator Stations. Untreated overflows at the Denny Regulator Station decreased to 1 from a baseline of 32 events, and volume decreased by 97.7 percent from pre-project levels. Programming changes made in August 2007 to the gate controls at the Dexter Regulator Station reduced the frequency of untreated overflows from an average of 15 to 5 events this year. While the volume of untreated CSO discharges was higher than the baseline, 99.7 percent occurred during the December 2007 storm. The second largest discharge was only 0.07 MG, suggesting that control may be achieved with additional refinement of the operating controls.

Henderson/Norfolk CSO Control System

In 2007–2008, 19.80 MG of treated CSO was discharged from the Henderson/Norfolk CSO Treatment Facilities to the Duwamish Waterway during one discharge event. This single discharge, which was in response to the December 2007 storm, occurred over 20 hours and was the largest discharge event to date from Henderson/Norfolk. No untreated discharges occurred at the three system outfalls (Henderson, Martin Luther King, and Norfolk).

The facility met all permit limits except the monthly and daily chlorine residual and fecal coliform limits. The hypochlorite feed rate required manual operation and chlorination was briefly lost during the December treatment event. Operations staff continues to troubleshoot and fine-tune the disinfection and dechlorination systems. Outcomes of their efforts will be evaluated during the coming season.

10.4 Pollution Source Control

Two source control programs in King County—the King County Industrial Waste Program and the Local Hazardous Waste Management Program—work to control pollutants at their source, thereby keeping them out of the wastewater system and, in turn, out of surface waters and the environment. The two programs complement each other. The King County Industrial Waste Program is operated by WTD. It focuses on larger businesses in a regulatory manner, issuing permits and discharge authorizations under a federally mandated pretreatment program. The

Local Hazardous Waste Management Program is a regional partnership under a state-mandated program that complements WTD's efforts to protect water quality. It focuses on smaller businesses and on households in a non-regulatory manner, providing technical assistance, resources, and education.

10.4.1 King County Industrial Waste Program

The King County Industrial Waste Program (KCIW) regulates industrial wastewater discharged into the King County wastewater system. The program serves to protect surface water and biosolids quality, the environment, public health, and the wastewater system and its workers. It does this by ensuring that industries treat wastewater for harmful substances such as metals, oils, acids, flammables, organic compounds, gases, and solids before discharging the wastewater to sewers.

The following sections describe KCIW's accomplishments in 2008. More information on the program can be found at <http://www.kingcounty.gov/environment/wastewater/IndustrialWaste.aspx>.

Permits, Authorizations, and Enforcement

KCIW may regulate any industry, from largest to smallest, if the industry discharges to the wastewater system. To do this, the program issues three main kinds of discharge approvals: letters of authorization, discharge authorizations, and permits. Letters of authorization are issued for limited-duration construction dewatering discharges. Discharge authorizations are issued to smaller industries. Permits are issued to industries that discharge more than 25,000 gallons per day and/or that are included in federally regulated categories. The U.S. Environmental Protection Agency (EPA) requires that at least 20 categories of industries obtain permits, whatever their size or quantity of wastewater. Permits have more comprehensive operating and self-monitoring requirements than do discharge authorizations.

Discharge of fats, oil, and grease from a petroleum or mineral origin (nonpolar FOG) is limited to 100 milligrams per liter. Industries must use oil/water separators to pretreat oily wastewater to prevent harm to the biological phase of wastewater treatment and must submit plans for the separators to the local sewer utility or to KCIW for review and approval before installing the separators. FOG from an animal or a vegetable origin (polar FOG) can block sewer lines. Although polar FOG has no numerical limit, dischargers are required to minimize free-floating polar FOG and may be required to complete a FOG control plan for King County's review and approval.

KCIW investigators inspect facilities before issuing discharge approvals and also inspect facilities with existing approvals to ensure that they are complying with regulations. Most companies are required to self-monitor their discharges. In addition, industrial waste specialists take verification samples at facilities that have been issued permits. If they find violations, the specialists conduct follow-up inspections and sampling.

The program issues a Notice of Violation when a company discharges more contaminants or volume than allowed, violates conditions of its discharge approval, or fails to submit required reports. For enforcement, KCIW uses tools such as compliance schedules, fines, charges for monitoring and inspections, and cost recovery for damages.

Table 10-4 shows the number of compliance samples collected versus the number of violations detected in 2008. During the year, 133 permits and 319 industrial waste discharge approvals were in effect and 435 inspections were conducted. A total of 112 Notices of Violation were issued to 29 companies (with several companies having multiple violations in more than one category):

- Seventeen companies had 35 discharge violations, including those based on self-monitoring data.
- Eleven companies had 48 permit/code violations.
- Nine companies had 29 reporting violations.

Three facilities had the most violations: Industrial Plating Corporation, a Seattle metal finishing company (11), the City of Redmond's decant facility (36), and TTM Technologies, Inc., a Redmond circuit board manufacturer (13).⁹

KCIW issued six fines totaling \$163,912. The largest fine, \$87,712, was issued to TTM Technologies, Inc. Sound Transit, the regional transit agency for central Puget Sound, was issued a fine of \$44,750. In lieu of including in Sound Transit's fine an amount that equaled what it had gained financially by avoiding compliance (\$54,872), KCIW agreed to allow the agency to perform a supplemental environmental project whose cost was equal in value to the amount of the fine that was avoided.

None of the violations identified by KCIW or by self-monitoring in 2008 caused NPDES permit exceptions at King County treatment plants.

⁹ A decant facility is a place where vector trucks that clean storm drains unload their water.

Table 10-4. Number and Type of Industrial Wastewater Compliance Samples Collected in 2008

	Compliance Monitoring	Post-Violation	Discharge Violation ^d
Cyanide amenable to chlorination	29		
Total cyanide	131		1
Metals	416	7	19
Organics			
BNA (base/neutral/acid)	34		4
VOA (volatile organic aromatic)	138		1
Fats, oils, and grease			
Polar ^a	20		1
Nonpolar	325		2
pH (field) ^b	527	17	6
Surcharge	490		
Miscellaneous ^c	98		2

^a The polar fats, oils, and grease (FOG) analyses are for the visual free-floating FOG test, not laboratory analyses.

^b The number of pH samples is somewhat misleading because it shows only discrete pH samples collected and analyzed in the field. The number does not include readings from continuous pH measurements.

^c Miscellaneous includes tests for dissolved sulfide, hydrogen sulfide (H₂S) field, polychlorinated biphenyls (PCBs), settleable solids, total phosphorus, and turbidity.

^d Discharge violations do not include those based on self-monitoring data.

Proposed Changes to King County Code and Public Rules

EPA's 2005 *Final Pretreatment Streamlining Rule* updated the National Pretreatment Program. The purpose of the rule is to reduce the burden of and provide flexibility in technical and administrative requirements for industrial users and publicly owned treatment works while continuing to protect the environment. For example, one provision has the potential to reduce KCIW monitoring from twice per year to once every other year or to once per year, depending on the industrial discharger. The reduced monitoring frequency could lower fees for some permit holders.

While parts of the rule were effective immediately, others require revisions to King County Code and public rules before they can be enacted. In 2008, KCIW proposed changes to both King County Code 28.84.060 and the public rules that govern the discharge of industrial waste into the wastewater treatment system. Two public hearings were held during the 45-day public comment period. The revised public rules (*Local Limits and Enforcement Response Plan*) became effective September 15. Final draft revisions to King County Code 28.84.060 will be presented to both Ecology and the King County Council in 2009. Additional opportunities for comment and review will be provided during the subsequent public comment process.

In light of the changes to code and public rule, KCIW proposed changes to the general requirements for the industrial pretreatment program during review of the draft NPDES permit

for the new Carnation Treatment Plant and the draft NPDES permit for the West Point Treatment Plant.

Mercury Reduction

KCIW’s nationally prominent dental waste program allows dentists to demonstrate that they are in compliance with the local limits for mercury by installing a pretreatment unit commonly known as an amalgam separator.

KCIW tracks the amount of mercury in biosolids produced at the West Point and South plants as a means to generally gauge the effects of the dental waste program and other programs aimed at reducing mercury coming into the plants.¹⁰ As shown in Figure 10-4, the amount of mercury in biosolids has dropped by over 50 percent from 2000, the year before King County began implementing the dental waste program, to 2004, the year in which a 97 percent compliance rate was achieved by local dentist offices. The 2008 median mercury concentration in biosolids from the West Point and South plants was 1.2 and 1.5 milligrams per kilogram (dry weight basis), respectively.¹¹ While West Point’s concentrations have remained stable since 2004, South plant’s concentrations reached a low point in 2006 and then rose in 2007 and 2008. Not enough data are available to determine if this is a trend.

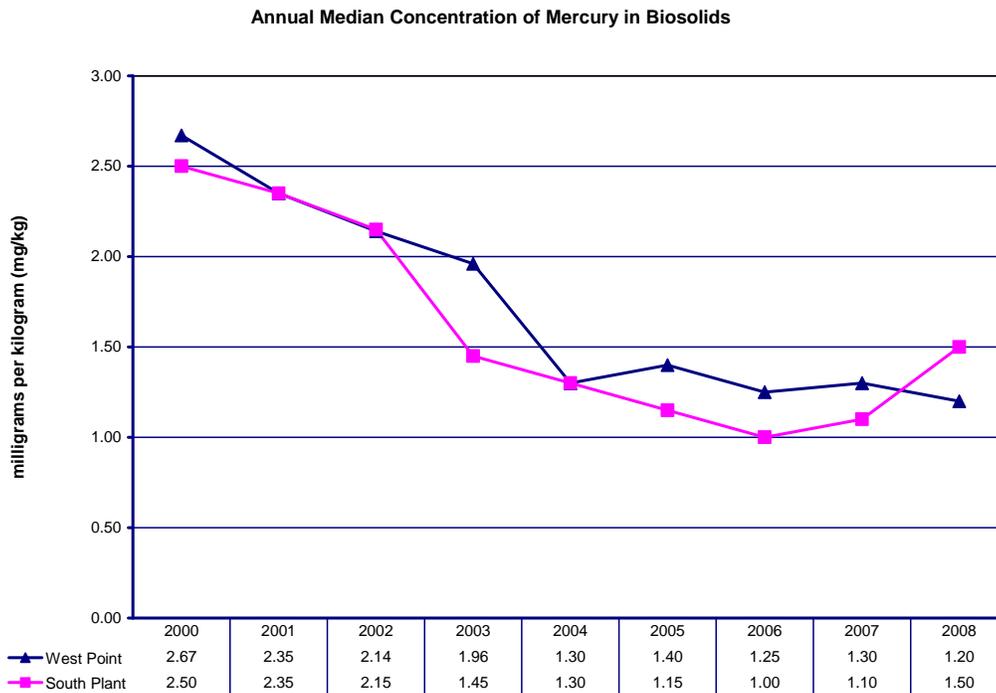


Figure 10-4. Decline of Mercury Concentrations in Biosolids, 2000 through 2008

¹⁰ See also the discussion on the EnviroStars program in the section on the Local Hazardous Waste Management Program.

¹¹ Washington State’s monthly average limit for mercury in biosolids is 17 milligrams per kilogram (WAC 173-308-160).

Other activities related to mercury reduction in 2008 include the following:

- Presented testimony before a subcommittee of the U.S. House of Representatives on King County's experience with both voluntary and regulatory programs to manage mercury discharges from dental offices.
- Participated in the Water Environment Research Foundation's project to estimate the potential for mercury bioaccumulation in waters that receive wastewater treatment plant effluent. KCIW provided samples and data from South plant.
- Conducted 97 random inspections of dental offices. All inspected offices were in compliance.
- Continued to be an active member of the Mercury Work Group under the NACWA.

Evaluation of Local Limits

Pretreatment programs are required to evaluate existing local discharge limits whenever there is a significant change in the wastewater treatment process or a significant change in influent quality at a wastewater treatment plant. New limits must be developed when the existing limits are determined to not be protective of an existing wastewater treatment system or when a new wastewater treatment plant is constructed. In 2008, KCIW evaluated whether the existing local discharge limits are protective of the new Carnation Treatment Plant's service area and planned for a similar evaluation of the future Brightwater Treatment Plant's service area.

Prior to startup of the Carnation plant in 2008, KCIW evaluated the proposed City of Carnation wastewater service area and conducted a survey of potential industrial users. The survey indicated that there are no industrial users in the Carnation service area that would require coverage under a discharge authorization or discharge permit. KCIW also evaluated the application of existing local discharge limits to discharges from hypothetical future industrial users in the service area. The evaluation determined that the existing local discharge limits would be protective as long as daily volume restrictions were imposed for specific parameters. If significant industrial users move into the Carnation service area, KCIW may need to reevaluate the efficacy of the limits.

Work in 2008 for the Brightwater plant involved fine-tuning flow-proportioning equipment and developing low-level metals sampling techniques. KCIW also developed a sampling and analysis plan for local limits sampling. In early 2009, the program will start collecting wastewater samples in the service area and, in 2010, will issue a local limits evaluation report.

Duwamish Waterway Source Control Projects

Although the sanitary wastewater component in CSOs is small and the industrial wastewater component even smaller still, KCIW actively seeks to control sewer-related pollution wherever it occurs in our system. To that end, the program is supporting efforts to clean up contaminated sediments in the Lower Duwamish Waterway (LDW) and East Waterway (EW) by participating in programs to control pollution at its sources and thus reduce the potential for recontamination

following cleanup. The efforts have helped hundreds of businesses and property owners meet regulatory obligations and correct issues such as hazardous waste storage, spill containment, and contaminant source removal.

Lower Duwamish Waterway

In 2008, KCIW performed the following source control activities in the Lower Duwamish drainage basin:

- **Sampling of industrial sewer dischargers for phthalates.** In 2006, KCIW collected 34 samples from industrial sewer dischargers in the LDW basin to analyze them for concentrations of two chemicals of concern—bis-2-ethylhexyl phthalate (BEHP) and butylbenzyl phthalate (BBzP)—and to determine if there are controllable industrial sources of these chemicals. Analysis indicated that the average industrial wastewater concentration of phthalates was at approximately the same concentration found in domestic/commercial areas of King County’s wastewater system. A final report was issued in early 2008; findings were presented to the Industrial Waste Advisory Committee and an LDW stakeholder group.
- **Atmospheric deposition sampling.** From October 2005 to April 2007, KCIW staff collected 16 rounds of atmospheric deposition sampling in the LDW basin. The sampling was conducted to evaluate the atmospheric deposition pathway to the LDW for phthalates, carcinogenic polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). Analysis of the samples indicated that atmospheric deposition is a pathway that needs to be considered when evaluating sources of contamination to the LDW. The final monitoring report was completed in early 2008; findings were presented to the Industrial Waste Advisory Committee and an LDW stakeholder group.
- **Participation in the LDW Source Control Work Group.** KCIW participates in monthly meetings of the Lower Duwamish Waterway Source Control Work Group (SCWG). The group is composed of King County, Port of Seattle, and City of Seattle and the two agencies (Ecology and EPA) with regulatory responsibility for different aspects of LDW sediment remediation. SCWG was formed to discuss source control issues and activities that can affect sediment remediation in the LDW; it has met regularly for several years.

In addition to these activities, KCIW staff has reviewed drafts of various Ecology source control action plans and data gap reports, coordinated on source control issues in areas of the King County International Airport, and contributed to LDW communication and outreach efforts, including Ecology fact sheets, the Duwamish River Festival, a virtual Duwamish Waterway tour, and stakeholder meetings.

East Waterway

In 2008, KCIW began work on the Harbor Island Superfund site’s East Waterway Operable Unit source control project. The project was initiated in 2007 in conjunction with sediment remediation, which is being implemented under an agreed order between the Port of Seattle and

EPA. The City of Seattle and King County are participating because of stormwater and CSO inputs to the EW.

Work in 2008 included planning and implementing source control activities, including business inspections and sampling, in order to supplement available chemistry data on CSOs. KCIW installed sediment traps and collected wet-weather wastewater samples from the Hanford No. 2 Regulator Station, collected solids samples during low flow from the Hanford No. 2 and Lander Street combined sewers, and collected wastewater samples for volatile organic compound analysis from the same sewers. In 2009, the effluent samples will be analyzed for PCBs, total organic carbon (TOC), semivolatile organic compounds (SVOCs), and metals. The solids samples are being analyzed for PCBs, total solids, TOC, SVOCs, and selected heavy metals. Results will indicate if additional source tracing is needed.

Also in 2008, KCIW collected samples of stormwater runoff to assess potential PCB concentrations in stormwater that enters the combined sewers from the south end of the old Rainier Brewery site that drains to the EW.

Urban Waters Initiative in Lower and East Duwamish Waterways

Ecology is implementing Urban Waters Initiative (UWI) source control inspections in the Lower Duwamish Waterway and East Waterway. UWI is being replicated simultaneously in two other urban basins in Washington State: Spokane and Commencement Bay. The City of Seattle and KCIW are participating in the initiative. During 2008, KCIW investigators conducted 16 inspections, which resulted in issuance of five discharge authorizations and three pending applications. KCIW also collected samples to follow up on source control issues observed during Ecology inspections. Some of the sampling data could be useful in interpreting CSO source characterization data. WTD is coordinating its sediment remediation activities in the Duwamish Waterway with the UWI work.

10.4.2 Local Hazardous Waste Management Program

The Local Hazardous Waste Management Program (LHWMP) brings together resources from four local government agencies and 37 suburban cities to protect and enhance public health and environmental quality by helping citizens, businesses, and government reduce the threat posed by the production, use, storage, and disposal of hazardous materials. The program is a regional partnership comprising King County Water and Land Resources Division and Solid Waste Division, Seattle Public Utilities, Public Health–Seattle & King County, and the Suburban Cities Association. In 2008, WTD paid about \$2.4 million into the Local Hazardous Waste Fund to support LHWMP. The fees are based on the actual volume of wastewater treated at King County's treatment plants.

The program provides collection and recycling services for household hazardous materials and wastes and offers public outreach aimed at proper handling and reduction in use of hazardous products. It also provides technical assistance, incentives, and recognition to businesses that generate small quantities of hazardous waste. The following sections focus on services in 2008

that helped keep hazardous materials out of sewers in King County's wastewater service area and, thus, out of surface waters in the region.

Waste Disposal and Recycling

LHWMP furnishes King County residents with household hazardous waste collection services at the Household Hazardous Wastemobile, which travels throughout the county, and at three fixed facilities located in Factoria (Bellevue), North Seattle, and South Seattle. In 2008, the program collected 1,826 tons of household hazardous waste from more than 44,877 customers. Also in 2008, LHWMP began a pilot project to determine whether it should provide collection for businesses that generate infrequent, small volumes of hazardous waste. By the end of the year, 278 businesses had brought in 31.2 tons of waste. The pilot project has been extended through the end of 2009 and now is being offered at all LHWMP facilities. Were it not for LHWMP's collection services, much of this waste could have ended up in regional landfills, sewers, storm drains, and the environment.

In addition, LHWMP is participating in a statewide medicine take-back pilot project that began in 2006. So far, LHWMP and its partners, Group Health Cooperative and Bartell Drugs, have collected over 16,000 pounds of waste pharmaceuticals for safe destruction. In addition, LHWMP is promoting policies at the state and national level that require pharmaceutical manufacturers to offer services for the safe management of unused drugs so that the drugs do not fall into the wrong hands or end up in the sewers and in the environment. For more information see <http://www.medicinereturn.com/>.

Strategic Planning and Refocus

During 2008, LHWMP continued implementing its 2006 strategic plan. While continuing many of the program's existing activities, the plan places increasing emphasis on eliminating the inclusion of the most problematic chemicals in commercial or consumer products; reducing the use of hazardous materials in sensitive environmental areas such as groundwater and wellhead protection zones, flood hazard zones, and commercial generators on septic systems; and allocating more resources to reducing the exposure of the most vulnerable and historically underserved populations to toxic materials.¹²

The program is encouraging companies that manufacture hazardous products to reduce the toxicity of their products and to view their responsibilities for those products expansively, through their full lifecycle. Progress is being made with respect to establishing take-back systems for consumer electronics, which is now in state law; pharmaceuticals, with major initiatives under way; lighting products, with a national system recently announced; and paint. Local take-back efforts have been developed for thermostats, fluorescent lamps, and other problem wastes.¹³

¹² The most problematic chemicals include priority pesticides, bisphenol-A, solvents, mercury, pharmaceuticals, lead, and polybrominated diphenyl ethers (PBDEs).

¹³ Take-back programs generally mean either that the manufacturers directly take back the product or that they pay for taking back and disposing of waste products, generally through a third party.

Community Outreach/Technical Assistance, Recognition, and Incentives for Businesses

LHWMP partners with community-based organizations, business organizations, trade organizations, housing authorities, and others to provide residents and businesses with information about ways to reduce the use of toxic and hazardous materials. Assistance and outreach programs and accomplishments in 2008 include the following:

- Recognizing businesses, through the EnviroStars program, for their efforts to reduce pollution. In 2008, 25 businesses in King County became new EnviroStars, bringing the total to 376, and 25 businesses increased their EnviroStars rating. Nine of the new EnviroStars were dental offices (some with more than one dentist) in recognition of their efforts to prevent discharge of mercury to sewers.
- Distributing at least 700 green home kits to historically underserved and vulnerable populations to promote proper disposal of household hazardous waste and the use of safer alternative products.
- Teaching students and educators about hazardous products and ways to reduce them, and working with schools to remove mercury and other hazardous materials.
- Providing technical consultations, fact sheets, brochures, and the Business Waste Line to help small businesses understand how to properly use, store, manage, and dispose of hazardous products and wastes. In 2008, the Business Waste Line assisted more than 1,626 callers, and field staff made at least 72 technical assistance visits to 70 businesses.
- Giving limited financial assistance to qualified businesses to facilitate waste disposal/reduction. In 2008, the Voucher Incentive Program reimbursed 68 businesses a total of approximately \$25,700.

For additional information about LHWMP services, visit www.govlink.org/hazwaste/.

10.5 Endangered Species Act Compliance

WTD continues to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (“Services”), as required under Section 7 of the Endangered Species Act (ESA), on projects that require a federal permit or receive federal funding. WTD’s past efforts to develop programmatic agreements with the Services (habitat conservation plan, programmatic biological assessments) and its funding of a position at National Marine Fisheries Service (NMFS) to review projects have helped make the Section 7 consultations more predictable and efficient.

In 2008, WTD ESA compliance activities included completing a technical memorandum on the impact of reclaimed water on ESA-listed species. The memorandum is available as a resource for any future reclaimed water projects that require environmental review and ESA Section 7 consultations. WTD also continued funding a position at NMFS to review WTD projects.