

Regional Wastewater Services Plan

2012 Annual Report

September 2013



King County

Department of Natural Resources and Parks
Wastewater Treatment Division

For comments or questions, contact:

Pam Elardo, P.E.

Division Director, King County Wastewater Treatment Division

201 South Jackson Street

KSC-NR-0501

Seattle, WA98104-3856

206-684-1236

pam.elardo@kingcounty.gov

This information is available in
alternative formats on request at
206-684-1280 (voice) or 711 (TTY).

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Executive Summary

The Regional Wastewater Services Plan (RWSP) 2012 Annual Report summarizes the progress made during 2012 in implementing the plan's major programs and projects. The report is presented in accordance with the RWSP reporting policies outlined in Ordinance 15384 and in King County Code 28.86.165. This is the 13th RWSP annual report that the Wastewater Treatment Division (WTD) in the Department of Natural Resources and Parks has prepared.¹

Highlights of RWSP implementation in 2012 are as follows:

- The Brightwater conveyance system was completed, and the full operation of the Brightwater Treatment System began on Oct. 29, 2012, including use of the new outfall into Puget Sound.
- The South Treatment Plant and the West Point Treatment Plant each received Platinum Peak Performance awards from the National Association of Clean Water Agencies (NACWA). Platinum level awards indicate multiple consecutive years of compliance with effluent limits established by National Pollutant Discharge Elimination System (NPDES) permit under the federal Clean Water Act and the state's Water Pollution Control Law.
- Progress was made on four RWSP conveyance system improvement (CSI) projects, including completion of the Bellevue Influent Trunk Improvement project.
- Construction was completed in March 2012 on the initial infiltration and inflow (I/I) reduction project in the Skyway Water and Sewer District.
- Work on four combined sewer overflow (CSO) control projects focused on project design and meetings with community members.
- The King County Council approved the 2012 CSO Control Program review report and amendment to the County's long-term CSO control plan.
- The final feasibility study for the Lower Duwamish Waterway Superfund project, which describes 11 sediment cleanup alternatives, was completed.
- West Point, South, and Brightwater treatment plants produced 114,255 wet tons of biosolids, all of which was recycled and used as a fertilizer and soil amendment for forestry and agricultural applications or used to make compost.
- Approximately 320 million gallons (MG) of reclaimed water produced at the South, West Point, Brightwater, and Carnation treatment plants was used for landscape irrigation, wetland enhancement, and industrial processes.
- Over 2.1 million therms of digester gas were used for treatment plant processes at West Point, South, and Brightwater treatment plants, and approximately 1.8 million therms of natural gas produced at South plant were sold to Puget Sound Energy (PSE).²

¹Previous RWSP annual reports are available at <http://www.kingcounty.gov/environment/wtd/Construction/planning/rwsp/Library/AnnualReport.aspx>.

²A therm is a unit of heat energy equal to 100,000 British thermal units. It is approximately the energy equivalent of burning 100 cubic feet of natural gas.

Background

King County adopted the RWSP in 1999 by Ordinance 13680 to ensure that the regional wastewater system keeps pace with growth and protects public health, the environment, and the economy. The RWSP outlines programs and projects through 2030 to increase system capacity and function and improve water quality; gives guidance on recovering and recycling beneficial resources from the wastewater treatment process; and provides direction on protecting and monitoring water quality and meeting permit conditions.

The adopted policies that guide RWSP implementation are in King County Code 28.86.010 through 28.86.180.

More information on the RWSP is available at

<http://www.kingcounty.gov/environment/wtd/Construction/planning/rwsp.aspx>.

Brightwater Treatment System

The Brightwater Treatment System is the largest expansion of the County's regional wastewater system in nearly 50 years. The Brightwater system includes a treatment plant, an influent pump station, a 13-mile-long conveyance pipeline, and a mile-long marine outfall in Puget Sound.

Construction on the Brightwater system began in 2006, and the project achieved substantial completion in 2012. As reported in the 2011 RWSP annual report, the treatment plant began operating on Sept. 6, 2011. At that time, treated effluent was routed to South Treatment Plant for discharge into Puget Sound because the conveyance system was not yet complete. Major achievements in 2012 were the completion of the conveyance system and the start of full operation of the Brightwater system on Oct. 29, 2012, including use of the new outfall into Puget Sound.

Since initial startup, the treatment plant has consistently produced effluent of exceptional quality and has met stringent odor control requirements. Through the end of 2012, there were no odor complaints attributed to the treatment plant.

In 2012, the Brightwater Environmental Education Community Center completed a successful year of operation. Over 4,000 students visited the center and toured the Brightwater Treatment Plant. In addition, the center hosted nearly 2,000 visitors from businesses, agencies, professional groups, and the public. The open space and walking trails at the center continue to be well-received by the community and are actively used throughout the year.

The January 2013 Brightwater Cost Update reported that the final cost estimate to complete the Brightwater project is \$1.86 billion, which represents no change from the January 2012 cost update. (See information on the Brightwater Cost Update later in this report.)

Because the Brightwater Treatment System was substantially complete in 2012, this is the last year it will be included in the RWSP annual report. More information on the Brightwater project is available at

<http://www.kingcounty.gov/environment/wtd/Construction/North/Brightwater.aspx>.

Conveyance System Improvements

The purpose of conveyance system improvement (CSI) projects is to increase capacity in areas of the separated conveyance system to meet projected demands and the RWSP 20-year peak flow design standard. In 2012, work began on the 2015 CSI Program Update and five RWSP CSI projects were in various stages of design, construction, or project development. The following sections describe these projects and summarize project activities in 2012.

Kent-Auburn Conveyance System Improvements

The Kent-Auburn Conveyance System Improvements Phase A project will construct approximately 4,000 feet of new sewer pipe in Auburn (the Stuck River Trunk), and 1,800 feet of new sewer pipe in Kent (the Kent East Hill Diversion pipeline).

The County received six construction bids in November, and a notice of selection was issued in January 2013. Construction of the pipelines is expected to be completed in 2014.

As of the end of 2012, the lifetime project cost estimate was \$21 million for the work associated with completing the Stuck River Trunk and the Kent East Hill Diversion pipelines and for completing 50 percent of design and easement acquisition for the Phase B pipelines.³ This is consistent with the project's baseline budget.

More information on the Kent-Auburn Conveyance System Improvements project is available at <http://www.kingcounty.gov/environment/wtd/Construction/South/KentAuburn.aspx>.

Sunset and Heathfield Pump Stations Upgrade

The purpose of the Sunset and Heathfield Pump Stations Upgrade project is to address identified capacity needs in the Vasa Park force mains and Sunset and Heathfield pump stations, located in Bellevue. The project will ensure there is adequate capacity to continue to safely and reliably convey wastewater flows from Sammamish, Issaquah, and Bellevue to the South Treatment Plant.

Work in 2012 focused on investigating a tunnel option that would eliminate the Heathfield Pump Station and potentially the Sunset Pump Station. A final project alternative is expected to be selected in fourth quarter 2013.

There have been no changes to the planning-level cost estimate of \$81 million for the project alternatives that involve upgrading one or both pump stations. The baseline budget for the project will be developed at the end of the predesign phase in 2014.

More information on the Sunset and Heathfield Pump Stations Upgrade project is available at <http://www.kingcounty.gov/environment/wtd/Construction/East/SunsetHeathfield.aspx>.

Bellevue Influent Trunk Improvement

The purpose of the Bellevue Influent Trunk (BIT) Improvement project is to construct a pipeline that parallels the BIT to serve the rapidly growing downtown Bellevue area and meet the RWSP's 20-year peak flow design standard. The BIT is designed to convey flows to the newly-upgraded Bellevue Pump Station. The project also includes design and construction of a new

³Phase B consists of construction of the Pacific Pump Station Discharge and Auburn West Interceptor Parallel pipelines. This phase has been deferred to accommodate other near-term capital projects.

portion of the City of Bellevue's West Central Business District (CBD) Trunk. Under a cost share agreement, the City of Bellevue is covering the costs associated with the improvements to the CBD Trunk and will also share a portion of the design, construction, and staff labor costs of the BIT.

Work in 2012 focused on construction of the BIT, which reached substantial completion in May. Because this project was substantially complete in 2012, this is the last year it will be included in the RWSP annual report.

As of the end of 2012, the lifetime cost estimate for the project was \$6.3 million, which is slightly below the baseline budget of \$6.5 million.

More information on the Bellevue Influent Trunk Improvement project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Completed/BellevueInfluentTrunk.aspx>.

North Creek Interceptor

The North Creek Interceptor project includes completing construction of approximately 10,000 feet of new sewer line, along with connecting this new line to previously constructed pipe. The project provides needed capacity to accommodate the projected growth and wastewater flows from southwestern Snohomish County.

Work in 2012 focused on project design and informational meetings with jurisdictions and area property owners. The project's baseline budget of \$56.6 million was established in the second quarter. Construction is expected to begin in 2014.

More information on the North Creek Interceptor project is available at <http://www.kingcounty.gov/environment/wtd/Construction/North/NCI.aspx>.

North Lake Sammamish Flow Diversion

Project development began on the North Lake Sammamish Flow Diversion project. The project will divert up to 43million gallons per day of wastewater flows from the North Lake Sammamish Basin to the Brightwater Treatment Plant to free up capacity in Section 1 of the East Side Interceptor.

Activities in 2012 focused on identifying project alternatives. A request for proposals is expected to be issued in summer 2013. As of the end of 2012, the project's planning-level lifetime budget estimate was \$20.8 million. The project's baseline budget will be established at the end of predesign.

For more information on the North Lake Sammamish Flow Diversion project, see <http://www.kingcounty.gov/environment/wtd/Construction/East/NLkSamFlowDiversion.aspx>.

Infiltration and Inflow Reduction Program

WTD continues to implement the Executive's Recommended Infiltration and Inflow (I/I) Control Program that was approved by the King County Council through Motion 12292 in May 2006.

The initial I/I project in the Skyway Water and Sewer District reached substantial completion in March 2012. The project included replacing full or partial side sewers serving 298 residential

properties, over 90 manholes, and approximately 19,000 linear feet of 8-inch-diameter sewer main. The purpose of the project is to determine whether and under what conditions it is possible to cost-effectively remove enough I/I from the regional conveyance system to delay, reduce, or eliminate a planned CSI project.

Results from flow monitoring and lessons learned from the project will help determine the next steps regarding the County's long-term Regional I/I Control Program.

There were no changes in 2012 to the project's baseline budget of \$11 million.

More information on the Skyway I/I reduction project is available at <http://www.kingcounty.gov/environment/wastewater/II/InitialProjects/Skyway.aspx>.

Combined Sewer Overflow Control Program

Work continued in 2012 to implement the County's CSO Control Program. The RWSP calls for continued CSO control improvements to meet the Washington State standard of no more than an average of one untreated discharge per year at each CSO location by 2030. One-half of the County's 38 CSOs are controlled, and projects to control CSO locations near Puget Sound beaches are under way.

This section provides information on progress made in 2012 on the following CSO control activities:

- Puget Sound Beach CSO control projects
- 2012 CSO Control Program review and plan update
- Consent decree that was negotiated with the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology)
- Performance audit of the CSO Control Program
- Cleanup of contaminated sediments near CSO sites under the County's Sediment Management Program
- Lower Duwamish Waterway Superfund project.

More information on the CSO Control Program is available at <http://www.kingcounty.gov/environment/wastewater/cso.aspx>.

Puget Sound Beach CSO Control Projects

The projects to control the County's CSOs near Puget Sound beaches are described below, along with highlights of activities that took place in 2012. The County continues to coordinate closely with the City of Seattle, other affected agencies, and residents and businesses in the project areas.

North Beach CSO Control Project

The North Beach CSO control project will design and build an underground storage tank in the rights-of-way in Northwest Blue Ridge Drive and Triton Drive Northwest in Seattle. The tank will store 230,000 gallons of peak flows when the North Beach Pump Station reaches maximum capacity. After storms have passed, stored flows will be transferred to the pump station for conveyance to the Carkeek CSO Treatment Plant and then to the West Point Treatment Plant for

treatment. During large storms when the West Point plant is at capacity, flows will receive CSO treatment and be discharged from the Carkeek CSO Treatment Plant.

Work in 2012 focused on project design and community outreach.

The project's baseline budget of \$20.9 million was established in the third quarter. Final design is expected to be complete in early 2013, and construction is expected to begin in fall 2013.

More information on the North Beach CSO control project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/NBeachCSOStorage.aspx>.

South Magnolia CSO Control Project

The South Magnolia CSO control project will design and build an underground storage tank in the Port of Seattle's Terminal 91 West Yard south of the Magnolia Bridge in Seattle. The facility will store 1.3 MG of peak flows when the South Magnolia Trunk reaches maximum capacity. After storms have passed, stored flows will be transferred to the Interbay Pump Station for conveyance to the West Point Treatment Plant.

Work in 2012 focused on project design and community outreach.

The project's baseline budget of \$46.2 million was established in the third quarter. Final design is expected to be complete in early 2013, and construction is expected to begin in late 2013.

More information on the South Magnolia CSO control project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/SMagnoliaCSOStorage.aspx>.

Murray CSO Control Project

The Murray CSO control project will design and build an underground storage tank beneath property across the street from West Seattle's Lowman Beach Park. The facility will store 1 MG of peak flows when the Murray Pump Station reaches maximum capacity. After storms have passed, stored flows will be transferred to the Murray Pump Station for conveyance to the West Point Treatment Plant.

Work in 2012 focused on property acquisition and project design, including meetings with the project's community-based Design Advisory Group. By the end of March, the six properties needed for the storage site were acquired and all tenants were relocated.

The project's baseline budget of \$50.4 million was established in the third quarter. Construction is expected to begin in 2013.

More information on the Murray CSO control project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/MurrayCSOStorage.aspx>.

Barton CSO Control Project

The Barton CSO control project will design and build green stormwater infrastructure (GSI) to control CSOs in the Barton basin. The project will construct bioretention swales (engineered rain gardens) between sidewalks and curbs in the Sunrise Heights and Westwood neighborhoods in West Seattle. Street runoff will flow into the bioretention swales during rainstorms. The water will then filter through bioretention soils for water quality treatment to a perforated pipe, which will take the water deep underground and allow it to slowly infiltrate into the soils. The project will reduce the amount of stormwater entering the combined sewer system and help to achieve CSO control at the Barton Pump Station.

Work in 2012 focused on design and community outreach.

The project's baseline budget of \$21.6 million was established in the third quarter. Street designs are expected to be complete in 2013. In addition, tree transplanting and gas line service adjustments will occur in 2013. Construction of the bioretention swales is expected to begin in 2014.

More information on the Barton CSO control project is available at <http://www.kingcounty.gov/environment/wtd/Construction/Seattle/BartonCSO-GSI.aspx>.

CSO Control Program Review and Plan Update

Work began in 2009 on the 2012 CSO Control Program review. The RWSP calls for conducting a program review prior to submitting a long-term CSO control plan amendment to Ecology. The update is required with each NPDES permit renewal application (about every five years) for the West Point Treatment Plant; the next permit renewal will occur in 2014.

The King County Executive's recommended CSO control plan was transmitted to the County Council in June 2012. The Executive's plan reflected community values, concerns, and preferences expressed during the CSO Control Program review process and recommended nine CSO control projects to control the remaining 14 uncontrolled county CSOs.

In September 2012, the King County Council, through Ordinance 17413, approved the 2012 CSO Control Program review and amendment to the County's long-term CSO control plan. The approved plan amendment includes construction of the nine projects by 2030 and meets the Ecology and EPA requirement that all King County CSOs be controlled by 2030. The planning-level cost estimate to complete the amended long-term CSO control plan is \$711 million in 2010 dollars.

Public input reflected in the plan includes:

- Completing projects in the Lower Duwamish River area sooner to coincide with sediment cleanup.
- Implementing opportunities for GSI techniques where they can complement and potentially reduce the cost of traditional storage and treatment options.
- Collaborating with the City of Seattle on projects to control stormwater that enters the regional sewer system and other joint projects where it makes economic sense to do so.
- Ensuring King County is committed to meeting federal and state water quality requirements by 2030.

The ordinance also authorized the County Executive to conduct a science-based water quality assessment and monitoring study. Results of the assessment will inform the next CSO control program review, scheduled to be submitted to the Council in 2017.

More information on the CSO Control Program review and plan amendment is available at <http://www.kingcounty.gov/environment/wastewater/CSO/ProgramReview.aspx>.

Consent Decree

In November 2012, the County Executive transmitted legislation to the County Council to enter into a consent decree with EPA and Ecology, which requires the County to implement its long-

term CSO control plan. The consent decree also provides direction for implementation of CSO control projects currently in design and improvements in operations of existing CSO treatment plants to meet effluent standards. The Council approved the consent decree in January 2013. The City of Seattle has also negotiated a consent decree to control CSOs in its wastewater system.

More information on the consent decree is available at <http://www.kingcounty.gov/environment/wastewater/CSO/ConsentDecree.aspx>.

Combined Sewer Overflow Performance Audit

As part of the 2012 adopted budget (Ordinance 17232), the County Council requested that the King County Auditor's Office conduct a performance audit of the County's CSO Control Program. The Auditor's Office submitted the performance audit to the County Council in October 2012. The performance audit concluded that the planning process for the CSO Control Program is professional and thorough and noted that opportunities may exist for improving the cost-effectiveness of the program.

More information on the performance audit of the County's CSO Control Program is available at <http://www.kingcounty.gov/operations/auditor/reports/year/2012.aspx>.

Sediment Management Program

As a part of RWSP implementation, WTD is carrying out a Sediment Management Program (SMP) to remediate contaminated sediments near CSO outfalls. Most of the contamination occurred in the early to mid-1900s. The SMP addresses sediment contamination cleanups that are required under federal Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) and state Model Toxic Control Act regulations. The SMP's objectives are to repair potential environmental damage in a timely, efficient, and economical process; to prevent harm to public health; and to limit future liability.

Activities in 2012 included the following:

- Conducted an additional year of post-construction sampling at the Duwamish/Diagonal cleanup site. The monitoring found that the cleanup site is stabilizing, as predicted, with the chemical concentrations similar to the surrounding areas. The influence of the ongoing discharges at the site has been far less than expected.
- Completed four years of post-construction monitoring at the Denny Way CSO site on Elliott Bay.
- Completed the final Human Health and Ecological Risk Assessments, Sediment Transport Evaluation Report, and Remedial Alternative and Disposal Site Screening and Remedial Action Objectives memorandums for the East Duwamish Waterway Superfund site.
- Continued pollution source control efforts along the East Duwamish Waterway.
- Completed the draft of the East Duwamish Waterway remedial investigation report and worked with EPA to address comments. Work began on the East Duwamish Waterway feasibility study.
- Continued work on an update to the Sediment Management Plan to address any cleanup needs at CSO outfalls not included in the 1999 plan; the update is expected to be complete in 2014.

More information on the SMP is available at <http://www.kingcounty.gov/environment/wastewater/SedimentManagement.aspx>.

Lower Duwamish Waterway Superfund Site

King County continues to work to improve water quality in the Lower Duwamish Waterway through actions such as controlling CSOs, restoring habitats, capping and cleaning up sediments, and controlling toxicants from industries and stormwater runoff. The County is partnering with the City of Seattle, the Port of Seattle, and the Boeing Company under a consent agreement with EPA and Ecology to prepare a remedial investigation and feasibility study for the Lower Duwamish Waterway Superfund site.

Efforts in 2012 focused on completing the final feasibility study, which describes the 11 cleanup alternatives being considered for the Lower Duwamish Waterway. In early 2013, EPA is expected to propose a cleanup plan based on the alternatives analyzed in the feasibility study.

The County also continued the second of three years of expanded source control work to identify and control the sources of pollution that may pose health or environmental problems if they accumulate in sediments or recontaminate cleanup areas. WTD entered into an interlocal agreement with Ecology to fund a portion of the County's work.

More information on the Lower Duwamish Waterway cleanup efforts is available at <http://www.kingcounty.gov/environment/wastewater/Duwamish-waterway.aspx>.

Odor Prevention and Control Program

RWSP policies provide direction on implementing an Odor Prevention and Control Program at all wastewater treatment plants and associated conveyance facilities that goes beyond traditional odor control. RWSP policies also call for including a summary of odor complaints in annual reports.

WTD received and investigated 49 odor complaints in 2012. When investigating an odor complaint, the source is not always identifiable. For example, some complaints received are in areas where there are no WTD facilities. Of the 49 complaints received, 25 were determined to be attributable to WTD facilities. The breakdown is shown in Table 1. No odor complaints were attributed to the Brightwater, West Point, Vashon, or Carnation treatment plants. Complaints attributable to WTD facilities were resolved through replacing carbon in odor control facilities, using chemical solutions, sealing manhole covers, and replacing equipment such as fan belts.

Table 1. Odor Complaints in 2012

Location	Complaints Received	Complaints Attributed to WTD Facilities
South Treatment Plant	1	1
Conveyance facilities that send wastewater to South Treatment Plant	18	10
West Point Treatment Plant	0	0
Conveyance facilities that send wastewater to West Point Treatment Plant	26	14
Brightwater Treatment Plant	4	0
Vashon Treatment Plant	0	0
Carnation Treatment Plant	0	0
Total	49	25

More information on the Odor Prevention and Control Program is available at <http://www.kingcounty.gov/environment/wtd/Response/OdorControl/GoodNeighbor.aspx>.

Biosolids Recycling Program

Biosolids are the nutrient-rich organic material produced by treating wastewater solids. After being processed and treated, biosolids are used beneficially as a fertilizer and soil amendment. RWSP biosolids policies encourage the County to continue to produce and market Class B biosolids and to evaluate alternative technologies to produce the highest quality marketable biosolids, including Class A biosolids.^{4,5}

In 2012, 114,255 wet tons of biosolids were produced at the West Point, South, and Brightwater treatment plants, all of which was recycled and used beneficially as a fertilizer and soil amendment for forestry and agricultural applications or was used to make compost. The sale of biosolids generated \$177,819 in fertilizer revenue from customers.

The biosolids were used as a fertilizer or soil amendment for a variety of applications:

- 7,500 acres of dryland wheat in Douglas County as part of the Boulder Park Soil Improvement Project
- 230 acres of hops, orchards, and wheat at Natural Selection Farms in the Yakima Valley
- 239 acres of state forestlands in King County and 588 acres of Douglas fir plantations in Hancock's Snoqualmie Forest as part of the Mountains to Sound Greenway Biosolids Forestry Program.

⁴Class B biosolids refer to biosolids that have been treated to significantly reduce pathogens to levels that are safe for beneficial use in land application.

⁵Class A biosolids refer to biosolids that have been treated to reduce pathogens to below detectable levels. Biosolids that meet this designation can be used without site access or crop harvest restrictions and are exempt from site-specific permits. Federal regulations require Class A level of quality for biosolids that are sold or given away in a bag or other container or that are applied to lawns or home gardens.

Other accomplishments in 2012 include the following:

- WTD launched the County's biosolids brand, Loop[®], at the 2012 Northwest Flower and Garden Show. The development of the Loop[®] brand is part of a long-term strategic goal to increase public support for biosolids. More information on the benefits and uses of Loop[®] is available at <http://www.loopforyoursoil.com/>.
- Work continued on the screening project at the West Point Treatment Plant to meet the state's biosolids management rule requiring removal of manufactured inerts, such as plastic, metals, and ceramics, that remain mostly unchanged during wastewater or solids treatment processes. The project will upgrade and replace the screening equipment that filters out trash and other debris.
- A request for proposals for biosolids composting services was issued, which attracted one proposal from a newly planned facility.
- WTD hosted two open houses where the public provided feedback on the future of King County's Loop[®] biosolids program. Both open houses included a workshop about gardening with recycled materials. Attendees expressed support for the Loop[®] biosolids program and encouraged staff to continue distributing information to the public.
- Construction was under way on the West Point Treatment Plant Digestion System Improvements project. The project will enhance the reliability of the West Point plant's solids digestion system and reduce the risk of digester upsets under current and future solids loading conditions. The project is expected to be complete in 2013.

More information on the Biosolids Recycling Program is available at <http://www.kingcounty.gov/environment/wastewater/Biosolids.aspx>.

Energy Recovery and Efficiency Program

RWSP policies call for the County to use digester gas, an energy-rich methane gas naturally produced as a byproduct of solids treatment, for energy and other purposes when it is cost-effective to do so. The South, West Point, and Brightwater treatment plants use digester gas to produce heat, electricity, and natural gas. In addition, energy audits of WTD facilities that are high-energy users are under way. The goal of the audits is to identify opportunities to increase energy efficiencies.

At the South Treatment Plant, digester gas that is not used for in-plant purposes is "scrubbed" to the quality required for pipeline natural gas and then sold to PSE. WTD used over 2.1 million therms of digester gas for plant processes and sold approximately 1.8 million therms of natural gas to PSE, generating approximately \$800,000 in revenue.

In 2012, construction was completed on the West Point Treatment Plant Waste-to-Energy project, which installed a new cogeneration facility that uses digester gas to generate electricity and heat for the plant. The project's two internal combustion engines have the ability to produce up to 4.6 megawatts of electricity, which is enough electricity to power about 2,500 homes. Startup began in 2012.

Other activities in 2012 include the following:

- Replaced preaeration blowers at the West Point Treatment Plant with more efficient

blowers. This effort was funded by a combination of an Energy Efficiency and Conservation Block Grant award and a conservation-based incentive payment from Seattle City Light.

- Continued work, with the help of incentive funding from PSE, to replace three secondary aeration blowers at South Plant with more efficient models.
- Secured nearly \$1 million in grants and \$3 million in Qualified Energy Conservation Bonds for equipment upgrades and replacements to save energy.
- Partnered with Seattle City Light and the Bonneville Power Administration on the High Performance Energy Management (HPEM) Program for West Point Treatment Plant. The HPEM Program focuses on achieving operational efficiencies in a variety of processes that when combined, can result in significant energy savings overall.
- Issued a request for information inviting local developers and commercial property owners to submit ideas for privately owned district energy systems that could extract and recover heat from WTD's conveyance system.

More information on the Energy Recovery and Efficiency Program is available at <http://www.kingcounty.gov/environment/wastewater/EnergyRecovery.aspx>.

Reclaimed Water Program

The RWSP encourages the County to explore ways to increase the use of reclaimed water at its existing and future wastewater treatment facilities. The following sections describe Reclaimed Water Program Activities in 2012. More information on the program is available at <http://www.kingcounty.gov/environment/wastewater/ResourceRecovery/ReWater.aspx>.

Reclaimed Water from the County's Treatment Plants

South Treatment Plant

The South Treatment Plant produced 95.3 MG of reclaimed water in 2012. The majority of the water was used at the plant for process water and landscape irrigation. If the reclaimed water were not available for these uses, WTD would have to use potable water for such applications, which would have increased the facility's operational costs by \$243,000 in 2012.

About 4MG of reclaimed water was distributed and used offsite by reclaimed water customers, including the City of Tukwila. The city uses reclaimed water for irrigation of the Starfire Sports Complex and wetland plants nursery, and for city public works uses such as street sweeping and sewer flushing.

West Point Treatment Plant

The West Point Treatment Plant produced 192.5MG of reclaimed water in 2012. All of the reclaimed water produced was used at the plant site for process water and landscape irrigation. If the reclaimed water were not available for these uses, WTD would have to use potable water for such applications, which would have increased the facility's operational costs by \$1.01 million in 2012.

Carnation Treatment Plant

In 2012, the Carnation Treatment Plant discharged 32.6MG of reclaimed water to enhance a wetland in the County's Chinook Bend Natural Area.

Brightwater Treatment Plant

Reclaimed water is used at the Brightwater Environmental and Education Center for non-drinking purposes such as toilet flushing and landscape irrigation. About 285,000 gallons of reclaimed water were used for these purposes in 2012.

Reclaimed Water Comprehensive Planning

Activities in 2012 focused on conducting economic, engineering, and environmental analyses on the three reclaimed water conceptual strategies. The analyses were carried out in accordance with Motion 13483.

More information on the reclaimed water comprehensive planning efforts is available at <http://www.kingcounty.gov/environment/wastewater/RWCompPlan/Library.aspx>.

RWSP Policy Amendments

In 2012, the King County Council approved two ordinances that amended RWSP policies in the King County Code (K.C.C.): Ordinance 17492, addressing debt financing and borrowing, and Ordinance 17480, amending RWSP reporting policies.

Ordinance 17492 amended Financial Policy-14 (K.C.C. 28.86.160), providing direction for variable rate debt to comprise no more than 20 percent of total outstanding revenue bonds and general obligation bonds. Previously, variable rate debt could not comprise more than 15 percent of these bonds. The recommendation for this amendment resulted from the Regional Water Quality Committee's Financial Policies Work Group (FPWG) review of RWSP financial policies.

The work of the FPWG also led to the development of Ordinance 17480, which amends the RWSP reporting policies in K.C.C. 28.86.165, as follows:

- Provides direction for the RWSP comprehensive reviews to include review of policy guidance for the construction fund and the emergency capital reserves.
- Specifies that the next RWSP comprehensive review is due to the King County Council by June 1, 2014.
- Deletes the requirement for Brightwater monthly reports that were required during Brightwater construction.

RWSP Cost Estimates

This section presents an update of the RWSP cost estimates through the year 2030. The cost estimates range in accuracy from planning level to final construction level because they are for projects in various stages of development, including planning, predesign, final design, and construction, and for completed RWSP projects.

The accuracy of cost estimates increases as projects become more defined and are specified in greater detail. Often the scopes of work and estimated costs for projects in the planning phase will change significantly as more detailed information becomes available.⁶

Table 2 compares 2011 and 2012 RWSP cost estimates. A challenge to providing a comparison of costs is that the RWSP is an ongoing plan that includes expenditures incurred in the past plus expenditures planned for the future. In presenting the comparison shown in Table 2, expenditures that have occurred through 2012 are included at their original value and future expenditures, planned for 2013 to 2030, are adjusted for inflation to a base year of 2012. Tables 3 through 6 present cost estimates by four categories: (1) completed RWSP projects; (2) Brightwater cost update; (3) RWSP projects in design or construction; and (4) RWSP projects planned for the future. Presenting costs this way provides a means to track incurred, current, and future costs separately.

Comparison of 2011 and 2012 RWSP Cost Estimates

Table 2 compares the 2011 and 2012 RWSP cost estimates. Previous CSO control project cost estimates, including those in 2011, were based on planning-level estimates developed in 1998 as part of the development of the RWSP. The 2012 estimate for implementing the projects and programs associated with the RWSP through 2030 is approximately \$4.1 billion in 2012 dollars, an increase of \$441 million from the 2011 RWSP cost estimate of \$3.66 billion in 2012 dollars. The change is largely attributed to (1) the update of CSO control project descriptions and costs resulting from the completion of the CSO Control Program review and approval of the amended long-term CSO control plan, and (2) more developed scopes of work and establishment of baseline budgets for the beach CSO control projects.

Specifically, the 2012 CSO cost estimates were updated to recognize higher property values, data from built projects and increases in allied costs. Also, earlier planning-level cost estimates are based on generic facility concepts. Specific details of a project such as location, technologies, and environmental impacts and potential mitigation of such impacts are determined later during project predesign. WTD typically develops project baseline cost estimates at the end of 30 percent design.⁷

⁶Accuracy of cost estimates for projects in planning can range from -50 to +100 percent.

⁷Project baseline is used as a basis for variance reporting and performance measurement.

Table 2. Comparison of 2011 and 2012 RWSP Cost Estimates, 1999–2030 (million dollars)

RWSP Element	2011 RWSP Estimates (2011\$)	2011 RWSP Estimates (2012\$)	2012 RWSP Estimates (2012\$)	Cost Change ^a (2012\$)
Total RWSP	\$3,630	\$3,665	\$4,106	\$441
Total Brightwater Treatment System^b	\$1,863	\$1,863	\$1,862	--
Brightwater Treatment Plant	\$679	\$680	\$677	(\$2)
Brightwater Conveyance	\$931	\$930	\$931	\$1
Land and Right-of-Way	\$104	\$105	\$105	\$1
Mitigation	\$148	\$148	\$148	
Total Treatment & Odor Control Improvements	\$196	\$200	\$199	(\$1)
Phase I & II Odor Control at South Plant (completed)	\$8	\$8	\$8	--
West Point Odor Control (completed)	\$1	\$1	\$1	--
West Point Digestion Improvements	\$9	\$9	\$8	(\$1)
King Street Regulator Odor Control (completed)	\$7	\$7	\$7	--
South Plant Expansion	\$123	\$127	\$127	--
Vashon Treatment Plant Upgrade (completed)	\$23	\$23	\$23	--
Carnation Treatment Plant (completed)	\$21	\$21	\$21	--
Chinook Wetlands Enhancement (completed)	\$3	\$3	\$3	--
Total Conveyance System Improvements (CSI)	\$936	\$953	\$954	\$1
Completed CSI projects, acquisitions, and planning	\$285	\$285	\$296	\$11
CSI projects in design or construction	\$221	\$226	\$226	--
Planned CSI projects, acquisitions, and planning	\$430	\$442	\$432	(\$10)
Total Infiltration/Inflow (I/I) Reduction^c	\$42	\$42	\$42	--
Total Combined Sewer Overflow (CSO) Control	\$528	\$543	\$981	\$438
Planned CSO Control Projects	\$451	\$464	\$755	\$291
CSO Planning and Updates	\$16	\$17	\$22	\$5
CSO control projects in design or construction	--	--	\$132	\$132
Sediment Management/Lower Duwamish Superfund	\$61	\$62	\$72	\$11
Total Reclaimed Water	\$39	\$39	\$42	\$3
Technology Demonstration (completed)	\$1	\$1	\$1	--
Existing Reclaimed Water Program	\$4	\$4	\$7	\$3
Water Reuse Satellite Facility (canceled)	\$5	\$5	\$5	--
Brightwater Reclaimed Water Pipeline	\$24	\$24	\$24	--
RWSP Water/Wastewater Conservation (completed)	\$1	\$1	\$1	--
Reclaimed Water Comprehensive Plan (completed)	\$3	\$3	\$3	--
Water Quality Protection: Freshwater Assessment Program and Reporting (completed)	\$16	\$16	\$16	--
Habitat Conservation Plan (HCP)/ Programmatic Biological Assessment (completed)	\$8	\$8	\$8	--
RWSP Planning and Reporting	\$3	\$3	\$3	--

Notes: Projects shown are not exhaustive, but are listed to illustrate changes. Totals may not add because of rounding to the nearest million.

^a Cost changes are explained in the sections that follow (completed RWSP projects; Brightwater cost update; RWSP projects in design or construction; and RWSP projects planned for the future).

^b The Brightwater cost estimates are shown in constant dollars to be consistent with other components of total RWSP costs. Table 4 presents Brightwater costs in nominal dollars, consistent with the Brightwater Cost Update: Current Conditions and Trends, January 2013.

^c Costs for the initial I/I reduction projects are funded by the CSI program in accordance with the recommended I/I program approved by the King County Council in 2006; therefore, costs associated with these projects are not shown in this line item.

Completed RWSP Projects

Table 3 summarizes the expenditures associated with completed RWSP projects through December 31, 2012. The change of \$38 million from 2011 reflects the addition of the costs associated with completion of the Bellevue Influent Trunk Improvement project, Decennial Flow Monitoring project, Brightwater Reclaimed Water Pipeline project, and Reclaimed Water Comprehensive Plan effort.

Table 3. Expenditures for Completed RWSP Projects(million dollars)

	Expenditures Through Dec. 31, 2011	Expenditures Through Dec. 31, 2012	Change from 2011
Total completed projects	\$420	\$458	\$38
CSI projects, acquisitions, planning	\$285	\$296	\$11
Treatment and odor control projects	\$64	\$64	--
Reclaimed water projects	\$7	\$34	\$27
I/I pilot study projects/program	\$40	\$40	--
Water Quality Protection: Freshwater Assessment Program and Reporting	\$16	\$16	--
Habitat Conservation Plan (HCP)/ Programmatic Biological Assessment	\$8	\$8	--

Note: Expenditures are shown at their original value. Totals may not add because of rounding to the nearest million.

Brightwater Cost Update

The January 2013 Brightwater Cost Update marks the 12th and final cost update prepared for the Brightwater project. It describes construction activities through January 2013, identifies the costs associated with these activities, and compares current costs to those presented in the January 2012 Brightwater Cost Update. The comparison is shown in Table 4. The Brightwater lifetime cost estimate as of January 2012 is \$1.86 billion. The January 2013 cost estimate shows a decrease of approximately \$4 million in treatment plant costs and an increase of \$4 million in conveyance costs, resulting in no net change in the overall project cost from the cost estimate presented in the January 2012 Brightwater Cost Update.

**Table 4. Comparison of January 2012 and 2013 Brightwater Cost Estimates
(million dollars)^a**

Brightwater Component	January 2012	January 2013	Dollar Change	Percent Change	December 2012 OMC ^b Estimate
Treatment	\$896.3	\$892.3	(\$4.0)	(0.4%)	\$898.1
Conveyance	\$963.6	\$967.6	\$4.0	0.4%	\$964.8
Total	\$1,859.9	\$1,859.9	\$0.0	0.0%	\$1,862.9

^a Totals may not add due to rounding.

^b OMC =oversight monitoring consultant.

More details are available in the January 2013 Brightwater Cost Update report at [http://mkcclegisearch.kingcounty.gov/2013 Brightwater Cost Update](http://mkcclegisearch.kingcounty.gov/2013%20Brightwater%20Cost%20Update).

RWSP Projects in Design or Construction

Table 5 shows cost estimates of RWSP projects in design or construction as of Dec. 31, 2011, and as of Dec. 31, 2012. These projects were included as part of the 2012 and 2013 King County adopted budgets, respectively. The cost estimates are shown in inflated dollars for both actual expenditures and projected costs. The expenditures are included at their original value.

The cost estimate for projects in design or construction in 2012 is \$503 million, a change of \$135 million from the 2011 estimate of \$368 million. This change is the net result of moving costs of projects that were completed in 2012 to the completed projects table (Table 3), moving costs of projects that began design or construction in 2012 from the projects planned for the future table (Table 6), and updated cost estimates of some of the projects in design or construction.

Table 5. RWSP Projects in Design or Construction (million dollars, inflated)

	2011 Cost Estimates ^a	2012 Cost Estimates ^b	Change from 2011
Total Costs for RWSP Projects in Design/Construction	\$368	\$503	\$135
Total Conveyance Projects	\$241	\$245	\$4
Kent-Auburn Conveyance System Improvements (Phase A and Phase B pipelines) ^c	\$54	\$55	\$1
North Creek Pipeline ^d	\$29	\$32	\$3
North Creek Interceptor ^d	\$65	\$56	(\$9)
Bellevue Influent Trunk Improvement (completed in 2012)	\$6	--	(\$6)
Sunset/Heathfield Pump Station Replacement and Force Main Replacement	\$81	\$81	--
Decennial Flow Monitoring (completed in 2012)	\$5	--	(\$5)
North Lake Sammamish Flow Diversion	--	\$21	\$21
Total Treatment and Odor Control	\$9	\$8	(\$1)
West Point Digestion Improvements	\$9	\$8	(\$1)
Total I/I^e	\$2	\$2	--
Total CSO Control Program	\$82	\$233	\$155
Sediment Management/Lower Duwamish Superfund ^f	\$64	\$75	\$11
CSO Planning and Updates ^g	\$17	\$23	\$6
Murray CSO Control Project ^h	--	\$50	\$50
Barton CSO Control Project ^h	--	\$22	\$22
South Magnolia CSO Control Project ^h	--	\$46	\$46
North Beach CSO Control Project ^h	--	\$21	\$21
Reclaimed Water	\$31	\$8	(\$23)
Brightwater Reclaimed Water Pipeline ⁱ (completed in 2012)	\$24	--	(\$24)
Reclaimed Water Comprehensive Plan ⁱ (completed in 2012)	\$3	--	(\$3)
Future Water Reuse ^j	\$4	\$8	\$4
RWSP Planning and Reporting	\$3	\$3	--

Note: Totals may not add because of rounding to the nearest million.

^aThis column lists project costs reported in the 2012–2017 WTD Capital Improvement Plan (CIP) budget submittal (July 2011).

^b Project costs in this column reflect costs reported in the 2013–2018 WTD CIP budget submittal (June 2012).

^cThe cost estimate to complete Phase A pipelines and 50 percent design and easement acquisition of Phase B pipelines is approximately \$21 million; the cost estimate to complete Phase B pipelines is approximately \$34 million.

^d North Creek Pipeline costs reflect costs associated with closing out of past construction contracts; North Creek Interceptor costs reflect the costs associated with completing the project.

^eThese costs reflect projected costs related to flow monitoring for the initial I/I reduction projects; ongoing modeling, cost-benefit analysis, planning, and reporting; public education; and regional I/I clearinghouse and other program related costs. The expenditures associated with the I/I pilot programs that were completed in 2006 are reflected in Table 3, Completed RWSP Projects.

^f The change in costs reflects costs projected for the additional source control efforts, additional work required to complete the Lower Duwamish Waterway feasibility study, and budget to complete the Sediment Management Plan update.

^gThe change in costs for CSO Planning and Updates is attributed to an increase in hydraulic modeling costs, and additional work associated with the Council's performance audit of the CSO control program; WTD oversight of the Water Quality Assessment and Monitoring Study that was authorized through Ordinance 17413; consent decree technical work and negotiations; and coordination activities with Seattle Public Utilities.

^h The baseline budgets for the Murray, Barton, South Magnolia, and North Beach CSO control projects were established in 2012. Previously, the costs for these projects were shown in Table 6, RWSP Projects Planned for the Future.

ⁱ The Brightwater Reclaimed Water Pipeline and the Reclaimed Water Comprehensive Plan were completed in 2012, and the costs are now included in Table 3, Expenditures for Completed RWSP Projects.

^j The change in costs for Future Water Reuse reflect projected future costs for customer support and development, initial permits, and engineering planning for reclaimed water use associated with the completed Brightwater reclaimed water pipeline.

RWSP Projects Planned for the Future

Table 6 shows 2011 and 2012 planning-level cost estimates for RWSP projects planned for the future. The costs are presented in constant dollars.

Table 6. RWSP Projects Planned for the Future (million dollars)

	2011 Cost Estimate(2011\$)	2011 Cost Estimate(2012\$)	2012 Cost Estimate(2012\$)	Cost Change(2012\$)
Total Planned Projects	\$1,004	\$1,033	\$1,314	\$281
CSI projects ^a	\$430	\$442	\$432	(\$10)
CSO control projects ^b	\$451	\$464	\$755	\$291
South plant expansion ^c	\$123	\$127	\$127	--

^aCSI project costs reflect the planning-level cost estimates that were developed as part of the 2007 CSI Program Update and adjusted for inflation to 2012 dollars, using the 3 percent per year assumption.

^bThe 2012 estimate for the planned CSO control projects reflect the 2012 CSO Control Program review planning-level estimate, which were in 2010 dollars, adjusted for inflation to 2012 dollars, using the 3 percent per year assumption. Previous estimates were based on the project descriptions and cost estimates developed in 1998, adjusted for inflation using the 3 percent per year assumption.

^cSouth plant expansion cost estimate reflects the 1998 planning-level estimate adjusted for inflation to 2012 dollars, using the 3 percent per year assumption.

Permit Compliance

On average, the County's treatment plants processed about 187MG of wastewater each day in 2012. All of the County's treatment plants operated without a single violation of their NPDES effluent limits.

The South Treatment Plant and the West Point Treatment Plant each received Platinum Peak Performance awards from NACWA. Platinum level awards indicate multiple consecutive years of compliance with effluent limits established by NPDES permits under the federal Clean Water Act and the state's Water Pollution Control Law. To date, South plant has attained 15 years of 100 percent permit compliance, and West Point plant has attained 11 years of compliance.

The Vashon and Carnation treatment plants each received gold awards from NACWA for 100 percent compliance for effluent limits within the past calendar year.

More information on WTD's NPDES permits is available at

<http://www.kingcounty.gov/environment/wtd/About/System/NPDES.aspx>.

Sanitary Sewer Overflows and Permit Deviations

Sanitary sewer overflows (SSOs) are discharges of wastewater from separated sewer systems and from combined systems when no rain is occurring or when the overflow is exacerbated by other factors. Permit deviations are occurrences that are not allowed by the NPDES permit, such as lack of disinfection of treated wastewater, but they are not considered a violation of effluent permit limits or overflows of untreated wastewater. Thirteen SSOs and one permit deviation occurred in 2012.

Causes of the SSOs are as follows:

- One SSO occurred at the Vashon Treatment Plant's outfall when a faulty cleanout valve released effluent during a high rain and high tide.
- Four SSOs occurred at pump stations. One occurred at the Barton Pump Station when a power bump caused the pump station to go offline. Two occurred at the 63rd Street Pump

Station because pumps were turned off due to repeated breaker trips. The fourth SSO occurred at the Bellevue Pump Station during a storm squall.

- Eight SSOs occurred in the conveyance system. Six occurred in manholes along the North Creek Interceptor during heavy rains. Repair and maintenance projects are under way to prevent overflows, and construction will begin in 2014 to add capacity to the pipeline. One occurred in the South Treatment Plant's Effluent Transfer System when a contractor broke a valve while removing a manhole cover. The other SSO occurred in the Thornton Creek Sand Catcher during a large rainstorm.
- The one permit deviation occurred at the West Point Treatment Plant during a power outage.

For all SSOs, WTD implemented prompt overflow response procedures, which include posting the area, cleaning up the area as appropriate, and monitoring water quality in the vicinity of the overflow to determine when pollutant concentrations return to levels consistent with state Water Quality Standards. WTD reported all SSOs and permit deviations to Ecology.

Combined Sewer Overflow Events

King County's CSOs are regulated through West Point's NPDES permit. WTD submits a report to Ecology each year on annual CSO volumes and frequencies and on progress made to control its CSOs.

With higher than normal rainfall in 2012, King County CSOs discharged a total of 1,405 MG over 324 events. This volume represents a 40 percent reduction from the 1981–1983 baseline volume of 2,339 MG. The majority of the storm events and the highest precipitation occurred in November and December, resulting in a discharge of 1,017 MG, or 72 percent of the annual total. The largest overflow was 152 MG at the Lander CSO during a storm that lasted over 142 hours.

More information on 2012 CSO events is available in the CSO Control Program 2012 Annual Report to Ecology at

<http://www.kingcounty.gov/environment/wastewater/CSO/Library/AnnualReports.aspx>.

Pollution Source Control Programs

Two source control programs in King County—the King County Industrial Waste Program (KCIW) and the Local Hazardous Waste Management Program (LHWMP)—work to control pollutants at their source, keeping them out of the wastewater system and, in turn, out of surface waters and the environment. KCIW is operated by WTD. The LHWMP is a regional partnership under a state-mandated program that complements WTD's efforts to protect water quality.

King County Industrial Waste Program

KCIW regulates industrial wastewater discharged into the King County wastewater system. KCIW works cooperatively with more than 1,500 companies and facilities to protect surface water and biosolids quality, the environment, public health, and the wastewater system. The program provides technical assistance and ensures that industrial facilities treat wastewater for harmful substances before discharging the wastewater to the sanitary sewers. KCIW issues three main kinds of discharge approvals: letters of authorization, discharge authorizations, and permits.

During 2012, KCIW conducted 424 business and facility inspections and collected more than 1,000 discrete compliance samples. In addition, 120 permits, 312 discharge authorizations, and 192 letters of authorization were in effect. Notices of Violation were issued to 43 companies and facilities for 81 violations; none of the violations caused NPDES permit exceptions at King County treatment plants.

More information on KCIW is available at

<http://www.kingcounty.gov/environment/wastewater/IndustrialWaste.aspx>.

Local Hazardous Waste Management Program

LHWMP brings together resources from local governments to protect and enhance public health and environmental quality by helping citizens, businesses, and governments reduce the threat posed by hazardous materials. The program is a regional partnership comprising the King County Water and Land Resources and Solid Waste divisions, Seattle Public Utilities, Public Health–Seattle & King County, and the Sound Cities Association.

In 2012, the program collected 1,478 tons of household hazardous waste from more than 46,000 customers.

More information on LHWMP is available at <http://www.lhwmp.org/home/>.

Water and Sediment Monitoring

To protect public health and King County’s significant investment in water quality improvements, the County regularly monitors treatment plant effluent, marine water, fresh water, and sediments. The parameters used to assess a water body’s health under Washington State Water Quality Standards are fecal coliform bacteria, dissolved oxygen, temperature, pH, nutrients, turbidity, and a variety of chemical compounds. Monitoring results for the previous year are presented as environmental indicators on the County’s Department of Natural Resources and Parks KingStat website

at <http://your.kingcounty.gov/dnrp/measures/2012/indicators/default.aspx>.

Overall, water and sediment quality conditions observed in 2012 were largely consistent with those observed in 2011 and in previous years. Key findings in 2012 include the following:

- Treatment plant effluent consistently met permit requirements.
- Waters in most urban streams frequently are warmer than Washington State temperature standards allow, have more bacteria than the standards allow, and occasionally do not have as much oxygen as required by state standards.
- The health of streams, as measured by the diversity and abundance of the community of organisms that live on the stream bottom, is generally not as good in urban areas.
- Three beaches in Lake Washington had incidents of high bacteria that did not meet state standards. These events were brief and did not result in beach closures.
- An unusually large marine phytoplankton bloom was observed throughout the Puget Sound Central Basin in September, and nutrient values throughout the water column in September and October showed effects of the bloom. Nitrate was reduced and ammonia

levels spiked in October following degradation of the bloom. These effects are attributed to the abnormally dry and warm weather that occurred in late summer and early fall.

- There were no exceedances of the standards for fecal coliform bacteria levels at the County's treatment plant marine outfalls in 2012.

In addition, investigations to locate sources of bacteria in Juanita Creek, Idylwood Creek, and the stormwater drainage infrastructure in White Center continued in 2012. When sources are identified, staff works with other entities, such as county and local stormwater programs, local sewer districts, and Public Health—Seattle & King County, to ensure identified sources are controlled.

Data and reports are available at the Water and Land Resources Division's Science Section website at <http://www.kingcounty.gov/environment/wlr/sections-programs/science-section/doing-science.aspx>.

Conclusion

WTD continued to implement the RWSP in 2012. Highlights of RWSP implementation in 2012 are as follows:

- The Brightwater conveyance system was completed and the Brightwater Treatment Plant began full operation on Oct. 29, 2012.
- The South Treatment Plant and the West Point Treatment Plant each received Platinum Peak Performance awards from the National Association of Clean Water Agencies (NACWA). Platinum level awards indicate multiple consecutive years of compliance with effluent limits established by National Pollutant Discharge Elimination System (NPDES) permit under the federal Clean Water Act and the state's Water Pollution Control Law.
- Progress was made on four RWSP CSI projects including completion of the Bellevue Influent Trunk Improvement project.
- Construction was completed in March 2012 on the initial I/I project in the Skyway Water and Sewer District.
- Work on four CSO control projects focused on project design and meetings with affected community members.
- The CSO Control Program review was completed and the King County Council approved an amendment to the long-term CSO control plan.
- WTD recycled the products of wastewater treatment—biosolids, digester gas, and reclaimed water.