Chapter 3

Conveyance System Improvements

The RWSP calls for improvements to King County's wastewater conveyance system. RWSP conveyance policies direct WTD to use the 20-year peak flow storm as the design standard for its separated wastewater system to avoid sanitary overflows and ensure there is sufficient capacity in the regional conveyance system to accommodate projected population growth. Because no uniform capacity standard was in place before adoption of the RWSP, portions of the regional conveyance system do not currently meet the 20-year peak flow storm standard. In setting this standard, the King County Executive and King County Council recognized that it is one of the most stringent standards in the nation and that it would take some time for the conveyance system to be upgraded to meet this standard.

This chapter begins with a description of the *Conveyance System Improvement Program Update* that was completed in June 2007 and then presents information on the RWSP conveyance projects that were in design or construction in 2007. The chapter concludes with major activities anticipated in 2008 as part of the Conveyance System Improvement (CSI) Program.

3.1 Conveyance System Improvement Program Update

Since 1999, the CSI program has worked to meet RWSP policy. The program has focused on upgrades and improvements to county-owned regional wastewater facilities in three important areas:

- Providing consistent conveyance system planning approach to the entire service area
- Adjusting for population growth and current operational and environmental considerations in the planning process
- Providing opportunities to coordinate capacity planning with local agencies to address issues, leverage resources, and minimize service disruption

The 2007 *Conveyance System Improvement Program Update* identifies projects to meet projected capacity needs through 2050, the date that the separated portions of the wastewater service area are projected to be fully built out.[1] During the update process, King County worked closely with the Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC),

[1] The 2007 *Conveyance System Improvement Program Update* is available at http://dnr.metrokc.gov/wtd/csi/library.htm.

through its Engineering and Planning (E&P) Subcommittee, and with individual local agencies.[2] Details on the update were reported in the *RWSP 2006 Comprehensive Review and Annual Report*.[3]

In recognition that long-term management of the conveyance system is expensive and depends on projections of future flow volumes that are themselves based on projections of regional growth and weather patterns, the update made several recommendations related to future conveyance planning. In November 2007, the King County Executive formalized these recommendations as amendments to RWSP conveyance policies. The King County Council approved the policy amendments via adoption of Ordinance 16033 in March 2008.[4]

Key elements of the adopted conveyance policy amendments are as follows:

- Update the CSI program every five years beginning in 2013 to ensure that the program remains current.
- Conduct systemwide flow monitoring to correspond with the population census that is conducted every ten years, to ensure flow projections remain accurate.
- To avoid overbuilding the system, perform field verification of wastewater flows and conveyance facility conditions prior to implementation of regional conveyance capital projects that are intended to expand capacity of the conveyance system.
- Evaluate other demand management methods to meet identified conveyance needs, such as infiltration and inflow reduction, water conservation, and reclaimed water facilities.

3.2 RWSP Projects in Design and Construction

RWSP conveyance projects in planning and design during 2007 include the Kent/Auburn Conveyance System Improvements, Black Diamond Infrastructure Upgrade, and North Creek Interceptor Improvements. Projects in construction during 2007 include the Bellevue Pump Station Upgrade, Hidden Lake Pump Station Replacement and Sewer Improvement, Fairwood Interceptor Sewer, and Juanita Bay Pump Station Replacement. The locations of these projects are shown in Figure 3-1.

[2] MWPAAC advises the King County Council and Executive on matters related to reducing water pollution. It was created by state law (RCW 35.58.210) and consists of representatives from cities and local utilities that operate sewer systems in King County.
[3] RWSP annual reports and comprehensive reviews are available at http://dnr.metrokc.gov/wtd/rwsp/library.htm.
[4] Ordinance 16033 is available at http://mkcclegisearch.metrokc.gov/attachments/29221.pdf.

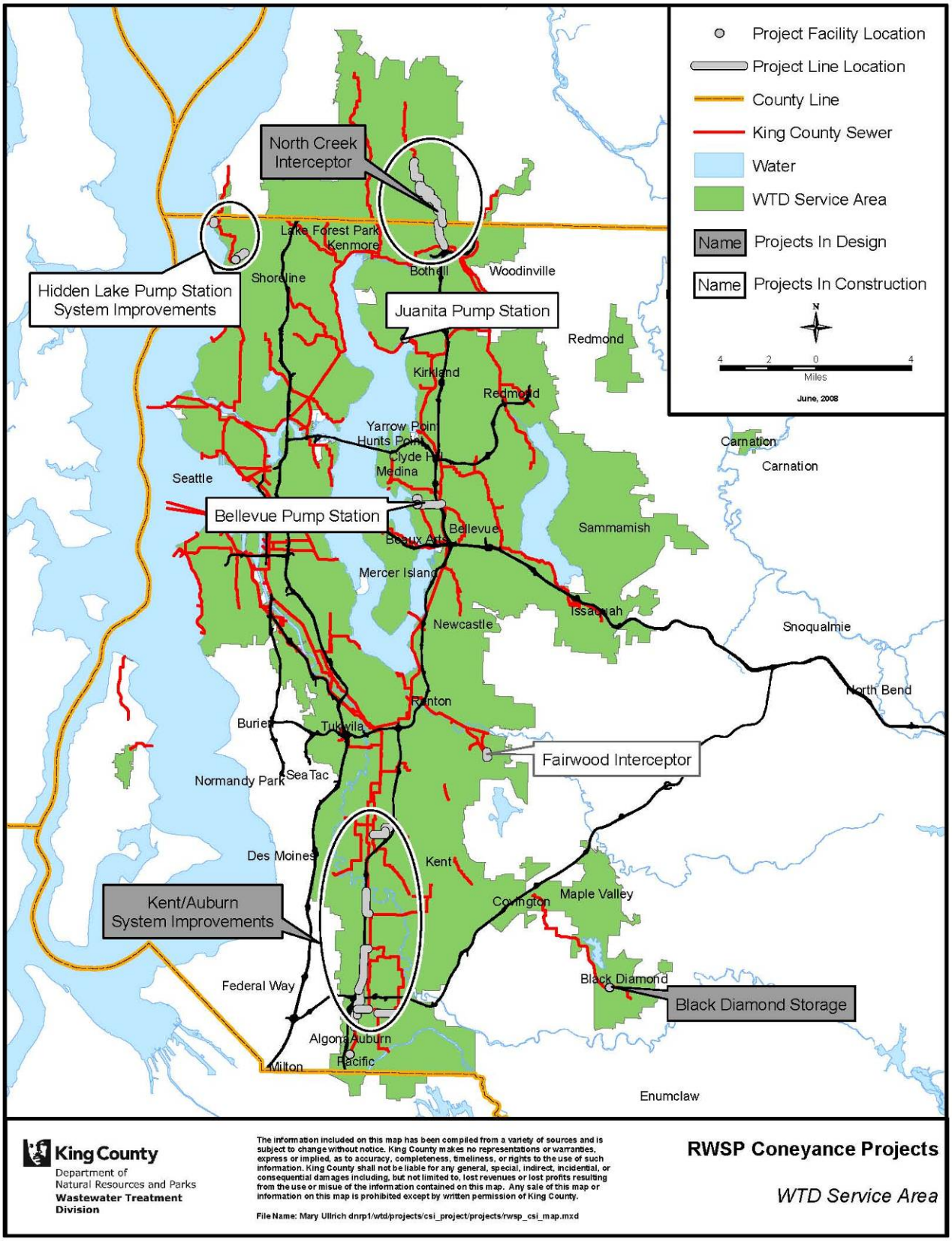

Figure 3-1. RWSP Conveyance Projects in Design and Construction in 2007

3.2.1 Kent/Auburn Conveyance System Improvements

The Kent/Auburn Conveyance System Improvements will provide additional capacity needed in the cities of Kent, Auburn, Algona, and Pacific. This project was formerly known as the Southwest Interceptor project, which proposed to meet the capacity needs in the Kent and Auburn CSI planning areas by rerouting flows to a new large-diameter sewer located primarily in the West Valley Highway right-of-way. In 2006 and 2007, additional analysis determined that the capacity needs could be met with construction of fewer miles of conveyance pipe. The revised project will construct about five miles of new conveyance pipe ranging from 18 to 42 inches in diameter.

To help identify preferred project elements and their locations, WTD staff met with stakeholders, large property owners, and staff from the Cities of Auburn, Kent, Algona, and Pacific. Four elements were identified:

- **Stuck River Trunk**. Located in Auburn, this new gravity pipeline will be constructed to convey flow away from the M Street Trunk to the Auburn West Interceptor.
- **Kent East Hill Diversion.** Located on the East Hill of Kent, this new gravity pipe will divert flow out of the upstream portion of the Mill Creek Interceptor and into the South 277th Interceptor.
- **Pacific Pump Station Discharge.** Located in Pacific, Algona, and Auburn, this new pipe will carry flow north from the Pacific Pump Station to the Auburn West Interceptor.
- **Auburn West Interceptor Parallel**. Located in Auburn, this new gravity pipe will either replace or parallel an existing portion of the Auburn West Interceptor between 15th Street Southwest and West Main Street.

WTD plans to construct the four project elements in two phases. Design for the first phase—the Stuck River Trunk and the Kent East Hill Diversion—will be completed in 2008 and pipes will be constructed by 2011. Property acquisition, permitting, and design drawings for the second phase—the Pacific Pump Station Discharge and Auburn West Interceptor Parallel—will be completed in 2009 and the pipes are planned to be in service no later than 2015.

Visit the project Web site for more information: http://dnr.metrokc.gov/wtd/projects/Kent-Auburn/index.htm.

3.2.2 Black Diamond Infrastructure Upgrade[5]

Growth in Black Diamond is projected to reach approximately 20,000 residents by 2025. As the city's wastewater conveyance and treatment provider, King County must build conveyance capacity to manage and transport flow from Black Diamond.

In 2007, WTD and the City of Black Diamond agreed to a phased approach to building new wastewater management facilities that will provide additional capacity:

[5] Formerly called the Soos Creek Sewer Improvements project.

- The decision was made to build an enclosed storage facility as the first phase of the project. Peak flows entering the pump station in Black Diamond will be stored and released slowly over time to avoid overwhelming the downstream conveyance system. The storage facility will extend the life of existing equipment and defer the need to build additional new pumping and pipeline facilities for several years. The facility is projected to be online in 2013. Activities in 2008 will focus on developing and selecting alternatives, completing predesign, and conducting an environmental review.
- Improvements in the second phase could include larger conveyance facilities, a satellite treatment facility, or a combination of both. The satellite treatment facility would be designed to treat effluent to reclaimed water standards so that the effluent can be used to recharge wetlands, irrigate nurseries and parks, and for some industrial uses. Facilities are projected to be operating by 2020. Activities in 2008 will focus on developing evaluation criteria, identifying potential projects, and conducting public outreach. A final decision will be made after further planning and analysis. Planning will incorporate outcomes from development of the first-phase storage facility and from development of the reclaimed water comprehensive plan (see Chapter 9).

Visit the project Web site for more information:
http://dnr.metrokc.gov/wtd/projects/BlackDiamond/index.htm.

3.2.3 North Creek Interceptor Improvements

Improvements to the North Creek Interceptor are necessary to avoid overflows and meet current and future growth needs in the North Creek basin. This project is located in unincorporated Snohomish County and the City of Bothell and consists of constructing 16,400 feet of gravity sewer pipes, ranging from 21 to 48 inches in diameter, to replace existing sewer pipes. The project will be constructed under two contracts, one for the North Segment located in Snohomish County and one for the South Segment located in the City of Bothell.

King County signed an interlocal agreement with the Alderwood Water and Wastewater District. The district is designing the project and will manage its construction. WTD staff is providing overall project management and oversight, including approving key design and construction decisions.

In 2007, activities focused on final design of the North and South Segments and obtaining all required permits and easements. North Segment construction will begin in summer 2008. Final design on the South Segment is anticipated to be complete in second quarter 2008, and construction is anticipated to begin in late 2008.

3.2.4 Bellevue Pump Station Upgrade

The Bellevue Pump Station needs to be upgraded to handle growing wastewater flows from the Bellevue area. Built in 1964, the facility pumps about 8 million gallons per day (mgd) of wastewater to the Sweyolocken Pump Station near the Mercer Slough. From there, the wastewater is piped to the county's South Treatment Plant in Renton. This project will increase

the Bellevue Pump Station's firm capacity to 11 mgd and will improve the station's electrical and control systems.[6] Because of space constraints, the Sweyolocken Pump Station could not be upgraded to handle these additional flows.

Pump station improvements include new pumps; new electrical, mechanical, and odor control equipment; a new standby generator; new aboveground facilities to house the new equipment; and better access for maintenance vehicles and workers. In addition to these improvements, a new 5,500-foot-long, 24-inch-diameter force main will be constructed to convey the added flows directly from the upgraded Bellevue Pump Station to the East Side Interceptor. The project is being implemented through two construction contracts: one for the force main and one for the pump station. Construction of the force main started in spring 2007 and was completed in 2008. WTD has been updating City of Bellevue staff, community groups, and affected property owners on project progress and milestones through a 24-hour community inquiry hotline and project Web page. WTD also has been responding to community inquiries to minimize disruption during construction. The pump station contract was advertised in November 2007 and was readvertised in June 2008 to secure lower bids. Construction is expected to be completed in 2011.

Visit the project Web site for more information: http://dnr.metrokc.gov/wtd/projects/bellevue/.

3.2.5 Hidden Lake Pump Station Replacement and Sewer Improvement

The 40-year-old Hidden Lake Pump Station does not have capacity to handle existing or future peak storm flows, nor does it meet current design standards for odor control, instrumentation, and equipment handling. Further, the pump station discharges to the Boeing Creek Trunk, which has a history of capacity, odor, and corrosion problems. This project will address these problems through new facilities to control overflows to Puget Sound and increase the capacity of the Boeing Creek Trunk.

The project is located in the City of Shoreline and includes constructing a new Hidden Lake Pump Station on the site of the existing pump station, replacing approximately 12,000 feet of the Boeing Creek Trunk, and building a 500,000-gallon underground storage facility in Boeing Creek Park. The new pump station will have a pumping capacity of 6.8 mgd, an increase of 2.5 mgd over the existing pump station's capacity of 4.3 mgd. Designed with public input, the new pump station will fit in the neighborhood and include native landscaping. The pipelines will be constructed by open-cut and microtunneling methods.

In 2007, the storage facility in Boeing Creek Park was completed and work continued on construction of the pump station and Boeing Creek Trunk. Work in 2008 will include startup of the storage facility, completion of the Boeing Creek Trunk, and completion and startup of the new pump station. Construction closeout will be completed in early 2009.

[6] Firm capacity means the capacity of the pump station with one of the larger pump out of service for maintenance or repair needs.

WTD staff is working closely with nearby residents and businesses to keep them informed of construction activities. Notice of activities is provided via mail, e-mail, phone, and door-hangers. Project updates and newsletters are widely distributed and posted on the project Web site. In addition, WTD holds community briefings and open houses, works directly with affected community members to problem-solve project-related concerns, and has established a 24-hour construction hotline for people to call with questions or concerns.

WTD staff is coordinating with the City of Shoreline, Ronald Wastewater District, and the City of Seattle to minimize community impacts. This coordination has made it possible to keep the Boeing Creek and Richmond Beach parks open during construction. The county is also replacing 6,000 feet of water mains owned by Seattle Public Utilities and replacing existing and constructing new manholes and sewer pipes for the Ronald district as part of this project.

Visit the project Web site for more information:
http://dnr.metrokc.gov/wtd/projects/hiddenlake.htm.

3.2.6 Fairwood Interceptor Sewer

This project replaced the erosion-prone and unstable Madsen Creek pipeline, which served the Fairwood community since the 1970s, with a new deep gravity Fairwood Interceptor located in a new alignment outside the Madsen Creek ravine. The new alignment follows Fairwood Boulevard for several blocks. It includes an inverted siphon underneath the west Madsen Creek tributary from the Fairwood Elementary School to the Bonneville Power Administration's right-of-way near 140th Avenue SE. In accordance with community preference, the new interceptor avoided the need to build a pump station in Fairwood. This project included improvements to existing Cedar River Water and Sewer District pipelines; these improvements were needed to make the new alignment feasible.

Construction of the project was substantially complete and the new interceptor began operating in December 2006. Restoration of roads, sidewalks, and public rights-of-way that were disturbed by project construction was completed in spring 2007. Final restoration of survey monuments and repairs to selected manholes and other closeout activities will be complete in 2008. Because this project is considered complete, this is the last year this project will be reported on in the RWSP annual report.

Visit the project Web site for more information: http://dnr.metrokc.gov/wtd/projects/fairwood/.

3.2.7 Juanita Bay Pump Station Replacement

The existing 14.2-mgd Juanita Bay Pump Station is an aging facility that is experiencing significant operational difficulties in conveying existing flows and that has insufficient capacity to convey future flows. To meet flow demands projected through 2050, a 30.6-mgd pump station is being built to replace the existing station. In addition to increased capacity, the new pump station will include features to improve safety and reliability, such as a standby generator, odor and corrosion prevention systems, improved access for maintenance vehicles and workers, and

equipment lifting devices. The existing and future pump stations are located at the intersection of NE Juanita Drive and 93rd Avenue NE in Kirkland.

Construction began in September 2005. Activities in 2007 focused on completing the 50-foot-deep underground structure that will house the two-stage raw sewage pumps and supporting equipment. Electrical system and heating, ventilating, and air conditioning (HVAC) system construction for the pump station was started in 2007. Startup and commissioning of the new pump station are expected to occur late summer 2008 and routine operation in 2009. The King County Industrial Waste Program presented the Silver Certificate in 2007 to WTD for discharge compliance during construction.

Project staff has been working closely with the surrounding neighbors and community. Staff distributes fliers and e-mail alerts to update community members about construction activities; responds to community questions and concerns via a 24-hour project construction hotline; and regularly updates the project Web site.

Visit the project Web site for more information:
http://dnr.metrokc.gov/wtd/projects/juanita/index.htm.

3.3 Schedule for 2008

CSI activities scheduled for 2008 are as follows:

- Complete design of the Stuck River Trunk in Auburn and the Kent East Hill Diversion, both part of the Kent/Auburn Conveyance System Improvements.
- Conduct predesign and planning activities, including siting and preliminary sizing, for the Black Diamond storage facility.
- Begin construction of the North Segment (summer) and South Segment (late in the year) of the North Creek Interceptor.
- Complete construction of the Bellevue Pump Station force main and advertise the Bellevue Pump Station upgrade construction contract.
- Start up the Boeing Creek Park storage facility, complete the Boeing Creek Trunk, and complete construction and start up the new Hidden Lake Pump Station.
- Complete construction closeout activities for the Fairwood Interceptor Sewer.
- Begin operating the new Juanita Pump Station (summer).