



**King County**

**Department of  
Natural Resources and Parks**

**Wastewater Treatment Division**

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 **King County**

# Brightwater

T R E A T M E N T S Y S T E M

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# Brightwater

T R E A T M E N T   S Y S T E M

Tunneling  
begins this summer -  
see inside for  
details!

## Brightwater Treatment Plant construction storm water treatment – an innovative approach

Brightwater's innovative approach to managing storm water during construction at the treatment plant site saves time and costly chemical treatment – and it starts with a simple idea: let the ground and plants treat the water runoff.

Rainwater traveling across the bare soil of construction sites picks up particles and pollutants which can be carried into local waterways. This erosion increases turbidity, or cloudiness of the water, negatively affecting water quality and fish.

To protect local waterways, construction sites use erosion control methods (commonly called best management practices, or BMPs) such as silt fences, vehicle wheel washes, straw, check dams, sediment traps / ponds, and chemical treatment systems. Chemical treatment is often used for sites with large areas of exposed soil, when they are near sensitive water bodies, or when construction must be performed during the wet season, which creates unique storm water management challenges. While effective, chemical treatment is also very expensive.

In addition to traditional BMPs, King County is using forest filtration to treat the storm water at the Brightwater treatment plant site on State Route 9. What makes this possible is the site's large undisturbed areas of trees and vegetation in the northern habitat area. Storm water from the south end of the site, where most of the construction occurs, is pumped to an irrigation-like system at the north end of the site where large sprinkler heads spray like rain into the native forest. The trees and grasses filter sediment and pollutants out of the water naturally.

Using this innovative storm water application approach, King County's contractors have been able to minimize the use of chemical treatment and still meet permit standards.

While ground filtration is not a new approach to treating storm water, it is usually not used on construction sites in this way, or on sites this large.

There have been challenges and lessons learned with this approach. For example, while the large sprinklers replicate rain, which helps the understory (or shrub) canopy and soil soak up more water, tree trunks in the frequent spray zone were temporarily wrapped with protective rubber to prevent any damage to their bark. The system itself needed to be sturdy enough to withstand the pressure of the amount of water being pumped through, and extra maintenance was initially required to remove clogs in the sprinkler heads. The application areas had to be closely watched for any signs of erosion from all of the added moisture, and adjustments had to be made in some areas.

As with any other permitted construction project, staff must monitor discharge going off the site. In this case, the treatment plant site discharges to Little Bear Creek, a highly sensitive salmon spawning creek. This storm water system is temporary and will be removed in a few years once construction is complete and the site's permanent storm water treatment systems are in place.

After 40 years of protecting water quality, King County's wastewater treatment utility is committed to meeting state permit requirements.

“The state Department of Ecology recognizes the careful approach we will take to protect Little Bear Creek, groundwater and other water resources while building the Brightwater Treatment Plant,” says County Executive Ron Sims. “We intend to be a good neighbor while building Brightwater and while operating it far into the future.” 



# Dig it - Brightwater tunneling to begin!

Over the next four years, 13 miles of tunnels, each about 16 feet in diameter, will be excavated from three access points to complete the Brightwater system and link the treatment plant with the marine outfall.

This summer will mark an exciting milestone for the Brightwater Project as tunneling starts from the North Creek site in Bothell.



Deep shaft construction to prepare for Brightwater tunneling has been underway since May 2006. The shafts, ranging in depths from 20 to 200 feet, provide launching and receiving sites for tunneling boring machines (TBMs), workers and soil removal.

## Brightwater construction sites update

King County is building a new wastewater treatment system called Brightwater to serve the growing needs of north King County and south Snohomish County.

Brightwater construction will take place at the treatment plant site, and four areas called portals to build the conveyance tunnels in Bothell, Shoreline, Kenmore, and at Point Wells to carry wastewater to and from the plant.

Once completed, the construction areas will be restored and improved with the mitigation investments proposed at each location.

The conveyance pipelines will be built almost entirely underground in tunnels 40 to 400 feet below the surface. Portals are the access shafts where workers, machines, soil and equipment will enter and exit the tunnels during construction. Tunnel boring machines (TBMs) will be used to build these tunnels underground.

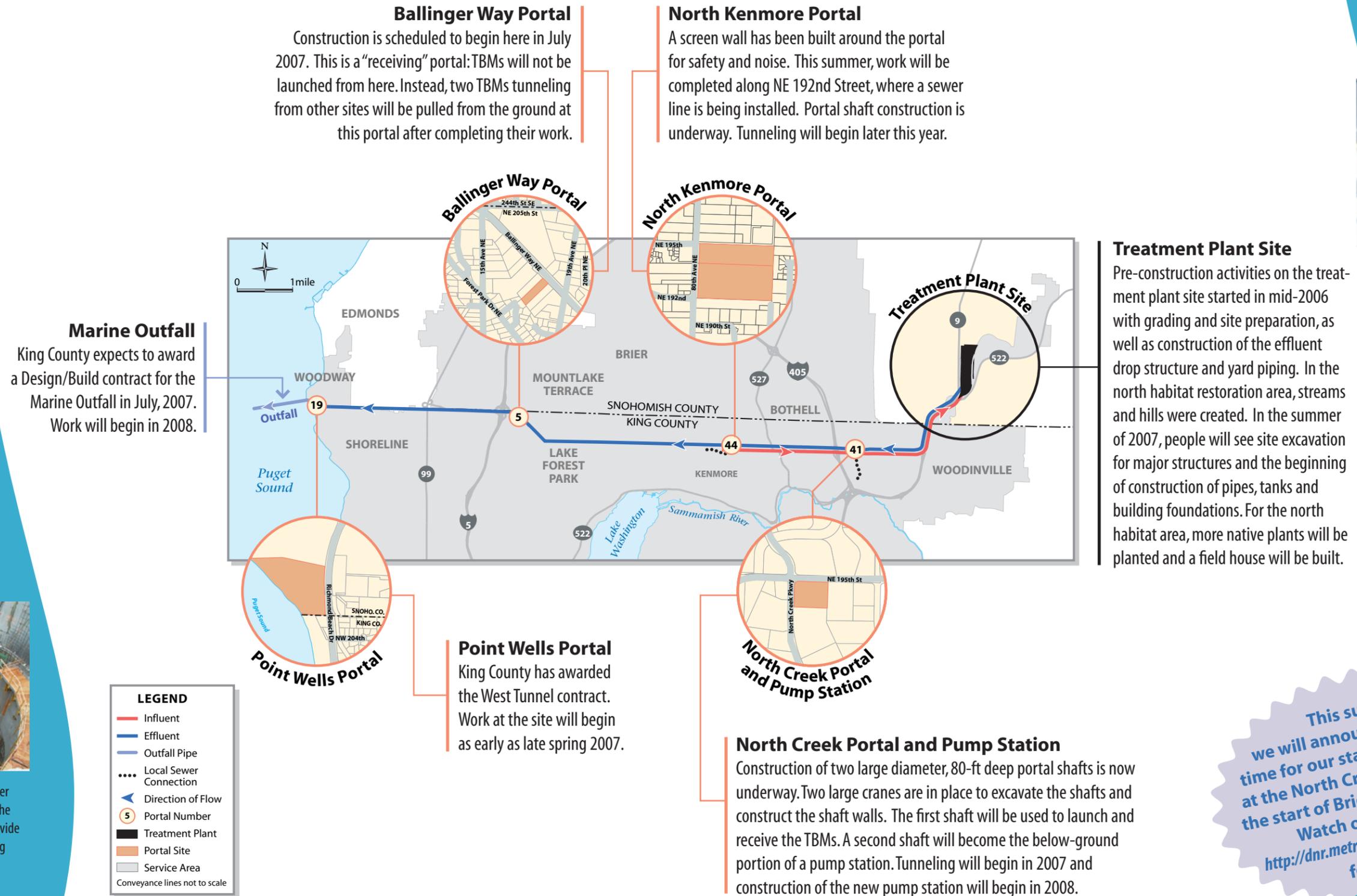
For more information, please visit: <http://dnr.metrokc.gov/WTD/brightwater/construction/index.htm>



TBMs for the Brightwater project are manufactured in Canada and Europe. Shown here is a Lovat TBM from Toronto, Canada, that was used to build wastewater storage tunnels recently under Seattle's Queen Anne and Beacon hills.



Sections of the TBMs are lowered into the shafts for assembly, testing and launching.



This summer, we will announce a date and time for our start-up celebration at the North Creek Portal to mark the start of Brightwater tunneling. Watch our Web site at <http://dnr.metrokc.gov/wtd/brightwater> for details.

# Stay involved in Brightwater

Community involvement continues to be an important part of the Brightwater project. We have an active speakers bureau and welcome the opportunity to meet with your neighborhood association or community group to discuss the Brightwater project or other water quality issues. If you are interested in arranging a speaker for your next group meeting, please contact us.

## We also welcome your comments, concerns, or ideas

Our address:

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### E-mail

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### Phone

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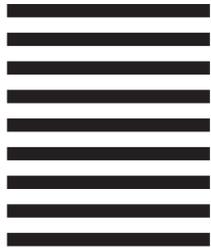
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FOLD ON DASHED LINE AND TAPE SHUT. PLEASE DO NOT STAPLE.

To keep community members informed about upcoming project activities, we are creating mailing lists for each of the Brightwater construction sites. If you are interested, give us your name, let us know which list you'd like to be on, and tell us how you prefer to be contacted. We occasionally send out e-mail updates between construction flier mailings.

- Route 9 treatment plant site
  - North Creek portal site (Bothell)
  - North Kenmore portal site
  - Ballinger Way portal site (Shoreline)
  - Point Wells portal site and Outfall (Shoreline/Woodway)
- Name: \_\_\_\_\_
- Please send me information by (please check one or both)
- E-mail: \_\_\_\_\_
- U.S. mail: \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## Brightwater Construction Timeline

2006	2007	2008	2009/2010	2010/2011
Work begins at Bothell and Kenmore tunnel construction sites	Work begins at the Point Wells and Ballinger Way tunnel construction sites	Marine outfall construction begins	Conveyance construction completed	Testing, startup, site restoration
Construction begins on north mitigation area of treatment plant site	Major construction at treatment plant begins	Influent Pump Station construction begins in Bothell	Treatment plant construction completed	
Site preparation begins on the rest of the treatment plant site				

## Salvaging plants and supporting jobs for people with disabilities

Buying native plants from King County nurseries supports two worthwhile programs: Native Plant Salvage and Supported Employment.

Through the Native Plant Salvage Program, volunteers dig up plants from construction sites around the county where the plants would otherwise be destroyed by clearing. These “salvaged” plants are cared for by volunteers until they are eventually replanted at King County projects (like Brightwater) to improve habitat and water quality.

For 20 years, people with developmental disabilities have been finding supported employment opportunities at King County. One such opportunity involves growing native plants at a King County Parks and Recreation Division greenhouse.

The northern 43 acres of the Brightwater Treatment Plant site, also known as the “North 40,” have been redeveloped as a restored and enhanced salmon habitat and reforestation area. After more than eight months of construction, this element of the Brightwater mitigation program has been planted with over 23,000 native plants, including 5,000 seedling trees from this program.

King County’s Wastewater Treatment Division saves about 40% on the price of the plants by going to the county nurseries rather than purchasing them through a separate vendor.

Douglas fir, red alder, tall Oregon grape, and snowberry are just some of the native species being planted. These plantings will help augment the large trees and native plants that already grow on the majority of the area. Many invasive species were removed

in the restoration efforts. The ecosystems being restored include upland forest, wetland forest, riparian areas and wetlands.

King County is planning a community planting event this October to give people an opportunity to be involved in the restoration efforts. If you are interested in learning about Brightwater events, please sign up for construction updates at <http://dnr.metrokc.gov/WTD/brightwater/construction/signup.htm>.

For more information about the Native Plant Salvage Program, please visit <http://dnr.metrokc.gov/wlr/PI/salopps.htm> or contact Greg Rabourn at 206-296-1923.

For more information about Supported Employment, please visit [www.metrokc.gov/parks/greenhouse/](http://www.metrokc.gov/parks/greenhouse/) or contact Sue Watling at 206-953-9057 or 711 TTY delay.

