

# Brightwater Treatment Plant

Northwest Consumer Construction Council

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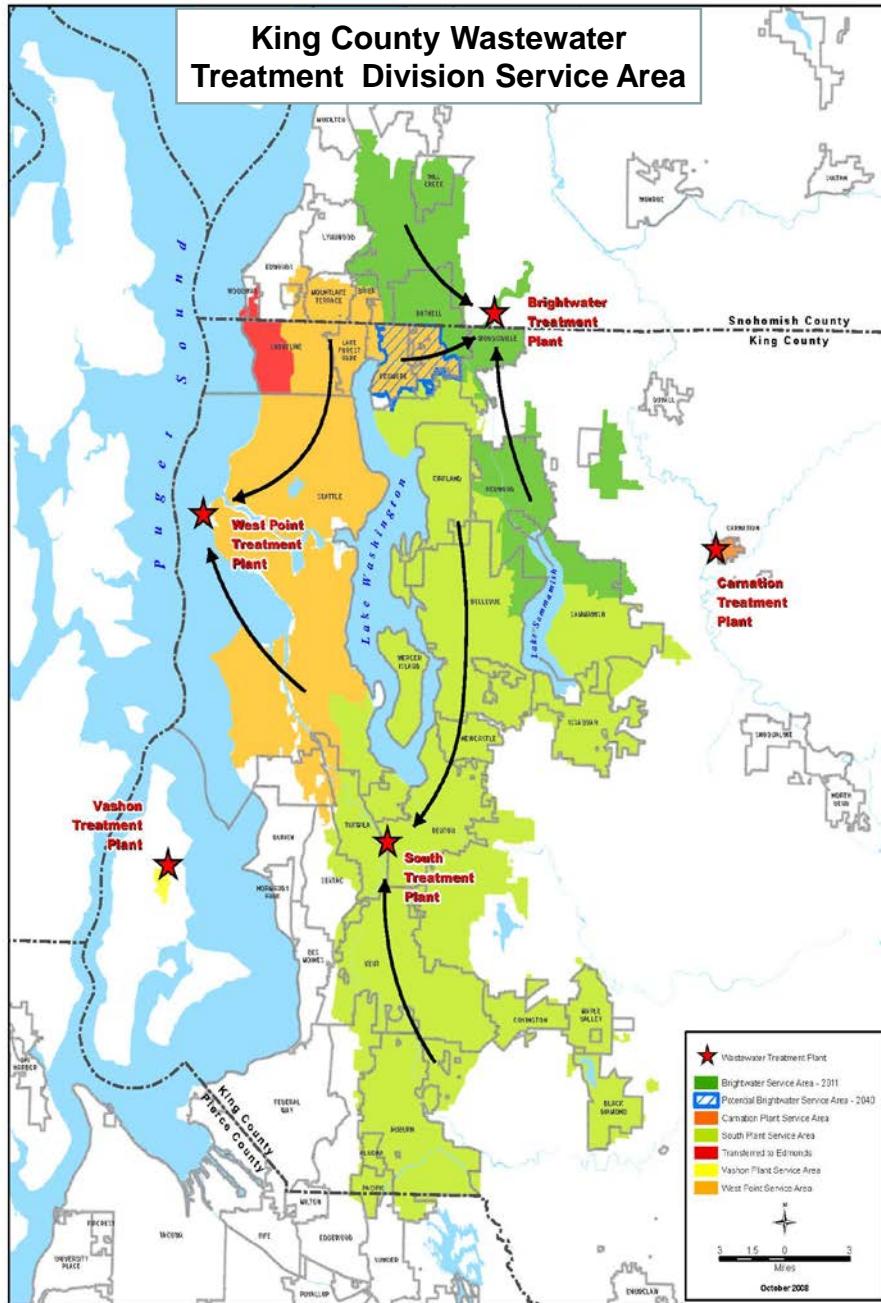


King County

7-21-08



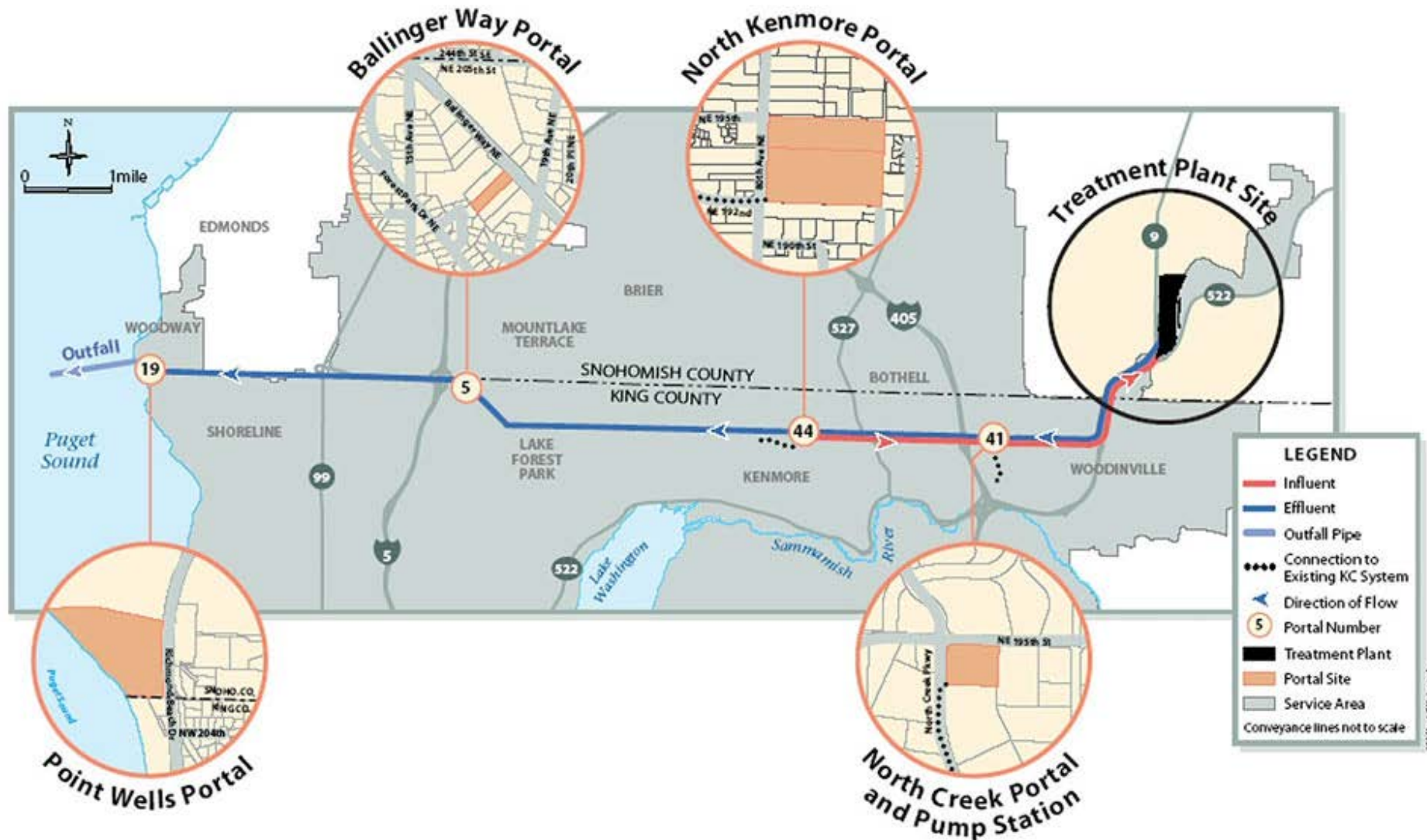
## King County Wastewater Treatment Division Service Area



# Regional Service

- 1.5 Million customers
- 600 employees
- 350 miles (540 km) conveyance pipelines
- 5 treatment plants
- 43 pumping, 19 regulator stations
- Resources created:
  - Fertilizer (biosolids)
  - Energy (biogas)
  - Reclaimed water
- Brightwater Flows:
  - 36 MGD base flow to 130 MGD peak flow

# Brightwater overview

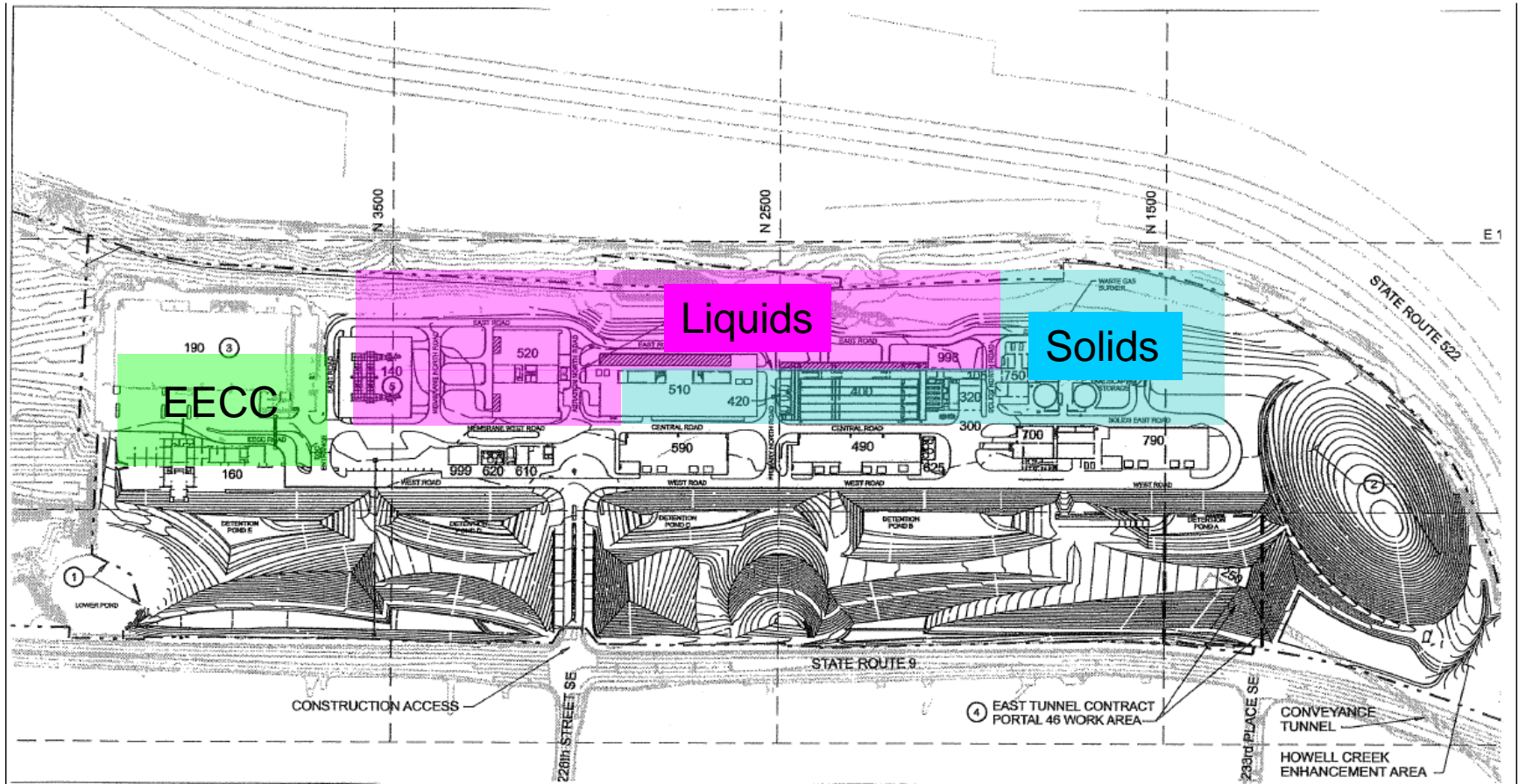


# Brightwater Treatment Plant

- ~\$500 Million Project, part of \$1.8 Billion Treatment system expansion
- GC/CM Project – Hoffman Contract for Liquids Structure work, Site Work, EECC and Mitigation Area Work.
- Concurrent Lump Sum Contract with Kiewit for Solids and Odor Control Work
- Hoffman Awarded work in May 2004. Construction started May 2006.
- Plant Operational January 2011



# Treatment Plant Site Layout



120 Acre Site  
36 Million Gallon / Day Treatment Capacity

# Challenges - Earthwork

- Earthwork - 750,000 cy yards of soil to move.
- Dewatering – All structures involve 30'-40' excavations into groundwater layers requiring extensive dewatering.
- Stormwater – Site parallels Little Bear Creek requiring extensive stormwater detention and treatment.



# Site Prep/North Mitigation Area





# Structures Construction



- Heavily Reinforced Structures due to Seismic Issues, Crack Control and IBC
- Congested Rebar





# Structures Construction



- Thick walls and slabs
- Emphasis on crack control leads to checker-boarding of walls and slabs
- 14 day cure time between adjacent pours
- 7 day water cure after pours





# Tower Crane on Rails



Leibherr 550's with 200' of Jib  
~ 16,000 lbs capacity

Primary Basins – 280' of Travel  
Aeration Basins – 180' of Travel





# Primary Sedimentation Tanks



# Aeration Basins



Aeration Tanks – 3 Tanks – 320' long x 26' wide x 30' deep  
~ 1.8 Million Gallon Capacity Each





Membrane Area & North end of Aeration Basins, looking Southeast <sup>13</sup>



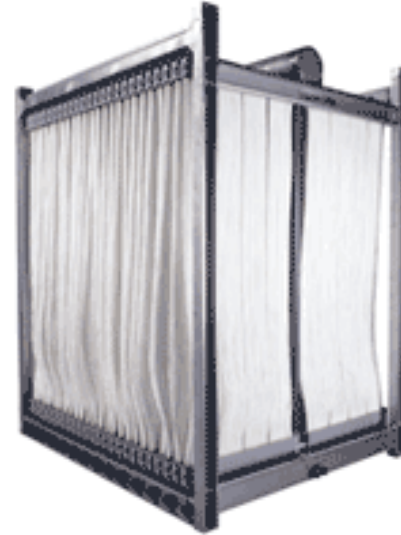
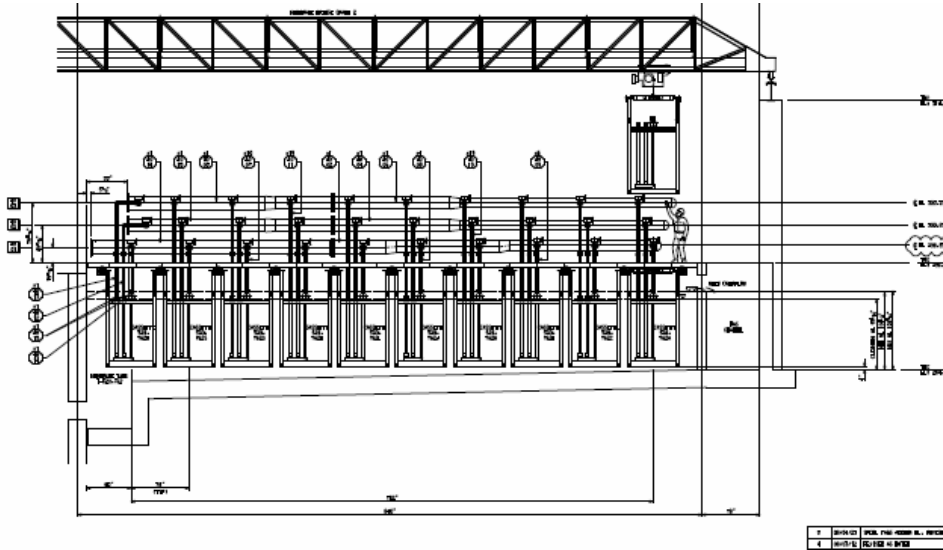
# Membrane Basins



Membrane Tanks – 10 Tanks - 70' Long x 28' Wide x 14' Deep



# Membrane Technology



Secondary Treatment Process is Largest Membrane Bio-Reactor in the Country  
36 Million Gallons/Day

## GE/Zenon supplied hollow fiber membranes

Membranes treatment produces reclaimed water, suitable for irrigation

# Odor Control Systems



All tanks covered and air treated  
by 3 stages of Odor Control.

Extensive odor control to achieve  
“No Odor” commitment

Foul Air Ducting for Odor Control

Odor Control at the site is a priority







Solids Holding Tank



# Brightwater Environmental Education Center



- 15,000 sf facility with access to 70 acres open space, trails, and habitat
- In 2017 – 17,578 participated in educational programs on-site
- Average rate of students of color for schools attending programs = 62% students of color



# Questions?

