Belfair Wastewater and Water Reclamation Facilities
Mason County

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Protecting Hood Canal
Below the Surface

- Deteriorated water quality in lower Hood Canal
- EPA 303(d) list of impaired water bodies for DO, fecal coliform and pH.
- Portion of the shellfish harvesting areas have been closed.
- Washington State Department of Health declared part of Hood Canal the severe public health hazard in 2002.
Project Background

- Existing Conditions and Future Plans

- On-site septic systems in Belfair Urban Growth Area (UGA).
  - Most of on-site septic systems are over 20 years old.
  - High groundwater
  - Poor soil
Key Environmental Studies

• Geotechnical
• Hydrogeological
• Hydrological
• Biological
• Archeological
Planning the Project with the Public
Protection of Surface Water

- Coulter Creek
- Theler Wetlands
- Union River
- Hood Canal
- Case Inlet
Project Features

- **Conveyance System**
  - 3 Pump Stations
    - 14,000 LF gravity sewers
    - 19,000 LF force mains
    - 5,000 LF of low pressure lines

- **Water Reclamation Facility**

- **Storage Pond and Irrigation**
  - 40 acre forest irrigation
  - 25,000 LF purple pipe
  - 700 sprinklers
Getting the Wastewater To the Treatment Plant – Conveyance

**Sustainable Design Elements**

- Architectural Screening Wall and Roof Façade.
- Odor Control
- Noise Control
- Permeable Pavement
- Large Underground Storage Pipe to protect Theler Wetland
Tunneling to Avoid Sensitive Areas
Vision coming into reality
Construction of Treatment Facility
Reclaiming the Wastewater

- Treat to Class A reclaimed water quality
  - Membrane Bioreactor (MBR) & Ultraviolet (UV) disinfection.
  - BOD < 20 mg/L
  - Turbidity < 0.2 NTU
  - TN < 10 mg/L
  - Total coliform < 2.2 MPN/100mL
Design in 3-D

- Helps with Owner Input
- Helps with Detailed Space
Sustainable Design Elements

- LEED silver building
- Reuse of Treated Water
- LID rain garden, permeable pavement and pavers
- Washington State University partnership
More Sustainable Design Elements

UV Disinfection
Energy Efficient Blowers
Emergency Pond
Covered Tanks at Wastewater Plant for Odor Control
Treated Water – Class A Reuse Standards
Earthen Dam at Treated Water Storage Pond - Geotechnical Design
Erosion Control on the Berms of the Treated Water Storage Pond
Opportunities

- Zero discharge
- Timber resource
- Private Public Partnership
Necessary Political Support
Needed Financial Support
Team Work and Commitment
Operators Involvement
Sustainable Growth