



**LOCATION**  
Hillsboro, Oregon

**PROJECT TYPE**  
Wastewater

**COMPLETION DATE**  
2017

**DESIGN FLOW**  
18,000,000 gpd  
68,000 m<sup>3</sup>/d

**TREATMENT**  
Fill-and-Drain Wetland  
Cells

**REFERENCE**  
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**PROJECT:**

## Clean Water Services Fernhill Western Wetlands

**NEED**

Clean Water Services (CWS) is a regional water utility serving the western side of the Portland, Oregon metropolitan area, which is experiencing rapid growth. As part of a long-term vision, CWS created the Fernhill Wetland area near Forest Grove, Oregon to preserve the water quality of the Tualatin River. Part of the Fernhill Wetland project required a low-energy process to remove ammonia and nitrate at flows up to 68,000 m<sup>3</sup>/d (18 MGD) from the adjacent Forest Grove wastewater treatment plant.

**SOLUTION**

Working with the research team from CWS, NWC developed a fill-and-drain wetland process that utilizes the ion exchange capacity of local basalt minerals to create very high rates of nitrogen removal through simultaneous nitrification and denitrification. The compact footprint of the fill-and-drain cells allowed the entire system to be constructed in an area no longer utilized by the wastewater treatment plant, expanding the overall wildlife habitat area of the Fernhill Wetlands.

**BENEFIT**

Located along a major migratory flyway, the overall Fernhill Wetlands provides a critical segment of wildlife habitat along the Tualatin River. The site is fully accessible to the public and is a popular recreational area for bird watching and trail walking. See <https://fernhillnts.org/> for more information.

The water quality benefits ensure reduced nutrient impacts to the environment, and the wetland ecosystem provides benefits such as temperature reduction, and important parameter in preserving salmon habitat.

