



WATER EFFICIENCY

OVERVIEW

The Pacific Northwest National Laboratory (PNNL) is the premier national laboratory for water efficiency evaluations, technical support, and training. PNNL works with federal agencies to help build strategies to improve water management, increase efficiency, reduce costs, and plan for future changes that will impact mission critical infrastructure.

PARTNERING WITH FEDERAL AGENCIES

PNNL has supported water management improvements for a variety of federal agencies, including the Army, Navy, Department of Energy, and the General Services Administration. PNNL's unique capabilities have enabled agencies to build strategies to meet requirements in legislation, executive orders, and agency-specific goals. For the Army in particular, PNNL was instrumental in the Net Zero Water program from concept to implementation. This partnership formulated the Net Zero Water framework. PNNL created comprehensive Net Zero Water Roadmaps for eight pilot installations, which identified 688 million gallons of water savings annually.

The roadmaps also assessed alternative water projects such as reclaiming treated wastewater to offset the use of freshwater. PNNL used this assessment to determine that the eight pilot sites have the potential to access 633 million gallons of alternative water annually.



Net Zero Water Pilot Locations

OUR CAPABILITIES

Policy and Strategic Planning

- » Executive orders and legislation guidance
- » Agency and site-level strategic plans

Comprehensive Evaluations

- » Water balance assessments
- » Life-cycle cost analysis

Training

- » Comprehensive training for facility and water managers
- » Web-based or in-person options

Technology Evaluations

- » Demonstration of emerging and underutilized technologies

Climate Change Modeling

- » Climate impact assessment on water resources

Alternative Water Evaluation

- » Wastewater reclamation feasibility studies
- » Rainwater harvesting feasibility studies

Industrial Process Assessments

- » Assessment of cooling towers, steam systems and power plants

COMPREHENSIVE WATER EVALUATIONS

PNNL performs comprehensive water evaluations for federal agencies around the world. These evaluations include the following steps:

STEP 1

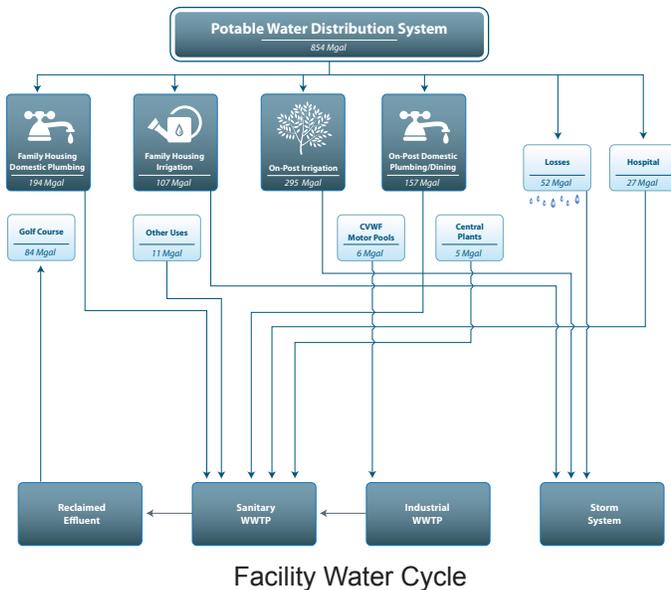
Current water use evaluation - PNNL assesses the current water use to determine a baseline.

- » Collect and review monthly water and sewer bills, on-site water production data
- » Determine water and sewer marginal rates
- » Conduct a walk-through survey of major water-using equipment

STEP 2

Water balance development - PNNL develops a water balance to prioritize for efficiency improvements.

- » Quantify the annual water supplied to the site
- » Quantify the annual use of water-consuming equipment
- » Compare the total annual supply to the total annual equipment water use
- » Determine the system water loss
- » Map water use by major end-use category



STEP 3

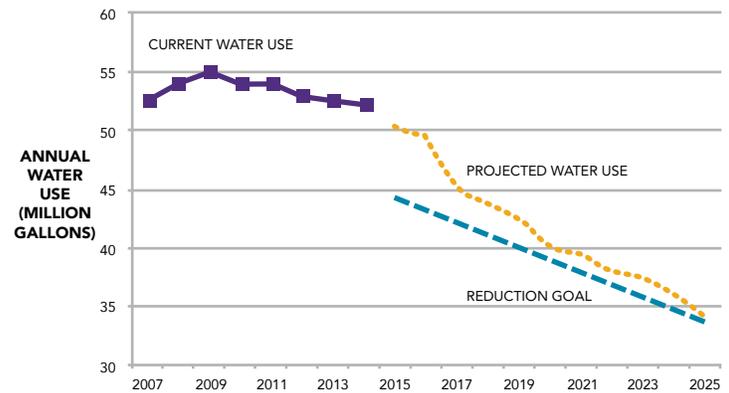
Identification of water efficiency opportunities - PNNL evaluates water efficiency opportunities to maximize savings. Equipment types that are investigated include plumbing, irrigation, and cooling and heating systems.

STEP 4

Economic analysis - PNNL performs a life-cycle cost analysis that determines the overall cost effectiveness of the retrofit and replacement options.

STEP 5

Implementation plan - PNNL develops a strategy to prioritize efficiency project implementation. A roadmap is developed that shows projected water savings in relation with the sites water reduction goals.



Annual Water Use Projection

FOR MORE INFORMATION, PLEASE CONTACT

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