

Water Treatment Engineering Research (WaTER) Laboratory

Denver Federal Center, Denver, Colorado

The Bureau of Reclamation's Water Treatment Engineering and Research (WaTER) Team uses and maintains two laboratory facilities on the Denver Federal Center campus: a bench scale chemistry lab and a laboratory-scale testing facility. The equipment set up in this lab is continually updated, based on Reclamation and its stakeholders' research needs.

Description

Research conducted in the WaTER Lab supports the goals of Reclamation's Regional and Area offices and the Research and Development Office, and promotes research that is of benefit to the water treatment community as a whole. The WaTER Lab is used to conduct experiments to demonstrate the performance and cost benefits of new materials, technologies, and methods developed to reduce the cost of water treatment and create new water supplies.

The Facility

The bench-scale chemistry lab is equipped for conducting organic chemistry synthesis. The laboratory-scale testing facility consists of an open space for bench-top and small pilot-scale testing using both synthetic water sources for controlled testing and natural water sources to simulate real-world applications. All of our testing equipment is capable of operating 24/7 for continuous, long-term testing and features LabVIEW™ based data acquisition to monitor and record process conditions. The following systems are currently operating in the WaTER Lab:



- Element-Scale Test Skid
 - Ideal for testing two 2.5" RO membranes (2540) in parallel
 - Designed for evaluating long term membrane performance, fouling, and salt transport
 - Allows for comparison of commercially available and prototype membranes
- MF/UF test system
 - Flexibility to accommodate modules of different physical sizes up to 1 gpm production capacity
 - Investigate different operational protocols for system optimization
 - Evaluate and optimize cleaning strategies
 - Automated backwash and cleaning strategies
- Flat sheet unit
 - Measures salt and water transport properties of newly developed membrane formulations

Services

The WaTER Team consists of scientists and chemical, mechanical, civil and environmental engineers with extensive experience in process development, instrumentation, optimization, and testing. Services by the WaTER Team, available for a fee, include:

- Design, install, and evaluate bench-scale, laboratory-scale, and pilot-scale desalination and water purification systems
- Evaluate processes for treating brackish water, seawater, irrigation return flows, produced water, and reclaimed water
- Develop and execute test plans, including quality control, monitoring, data acquisition and analysis, and technical report writing
- Troubleshoot processes and equipment
- Conduct Environmental Technology Validation (ETV) Testing in conjunction with the National Science Foundation (NSF) International
- Participate in round-robin studies to validate methods, materials, and processes
- Measure membrane transport properties and fouling tendency of new or experimental membranes
- Perform membrane autopsies
- Participate in standards setting
- Teach advanced treatment workshops on desalination, reuse, concentrate management



Partners

The WaTER Lab works with other government agencies, non-government organizations, universities, and rural or municipal partners interested in advanced water treatment as a means to expand potable water supplies.

Disclosure and Confidentiality

We have experience working with partners who are interested in protecting intellectual property and require data confidentiality. For more information, please contact Samantha Zhang, at 303-445-2126 (szhang@usbr.gov).

Fees

The fee schedule for the WaTER Team is set by Reclamation's Technical Service Center.

Contact

Please contact Chris Holdren, at 303-445-2178 (gholdren@usbr.gov) to find out how to use our expertise, services, and laboratory facilities.