

## UV Validation Facility

### HIGHLIGHTS

Independent survey initiation, site identification, design, and facility management for U.S.-based, 40-mgd UV validation facility.

Coordination/development of site use, logistics, testing protocol, testing, data analysis, and reporting.

World's largest UV validation facility.

To receive inactivation credit with UV disinfection, the USEPA will require that UV systems undergo performance validation testing. Until recently, UV systems installed in the U.S. were validated either on site or at a facility in Europe. Recognizing a need for a U.S. facility, Carollo independently initiated its own survey to find a location to develop a validation facility. We identified the City of Portland's South Shore Well Field as an ideal location for such an activity. It can provide 90 mgd of chlorine-free, low UV-absorbance groundwater at a constant flowrate and has a NPDES permit that allows us to discharge the test water to the Columbia River. We struck an agreement with Portland to develop a test center adjacent to their 2-mgd reservoir tank.

Carollo obtained funding for development of the facility from two UV system suppliers: Calgon Carbon Corporation and WEDECO Ideal Horizons. We designed the facility in November 2002, and construction started in February 2003. Carollo is responsible for managing the facility and conducting all testing. This includes coordinating site use between the two participating UV vendors, logistics, test protocol development, testing, data analysis, and reporting.

Carollo commissioned the site in March 2003 with the testing of a 40-mgd, medium-pressure UV system supplied by Calgon. Since then, Carollo has tested six different large-scale UV reactors at flowrates ranging from 1 to 42 mgd at UV transmittance values ranging from 70 to 98 percent. This testing comprises over 320 challenge tests using MS2 coliphage to demonstrate UV doses ranging from 20 to 80 mJ/cm<sub>2</sub>.



*Validation of a 40-mgd UV reactor moves large-scale UV from research to practice.*



The current round of testing will be the first to use a new challenge microbe optimized for the USEPA Tier 2 validation. This new microbe was identified through Carollo's AwwaRF Tailored Collaboration project, Optimization of UV Validation, and has the potential of reducing UV costs by as much as 30 percent.

The success of the Portland validation facility makes large-scale validation a reality today. Large cities seeking UV disinfection can now confidently plan the use of large-scale reactors to comply with the Long-Term 2 Enhanced Surface Water Treatment Rule.