



Remote Water Quality Monitoring of Drinking Water Treatment Systems

National Risk Management Research Laboratory
 Water Supply and Water Resources Division
 Water Quality Management Branch and Microbial Contaminants Branch

Objective:

The Safe Drinking Water Act and its Amendments require all conventional drinking water treatment system operators to provide water quality monitoring. This paper presents a summary of remote monitoring system components, identifies design and implementation criteria and potential long-term benefits of the system.



Bryant Street Pumping Station (Washington D.C.).

Typical Components of Remote Monitoring System

System Component	Description
Online Sampling - Instrumentation	Electronic Valves, pumps, switches and monitoring instruments/sensors.
Communication Media	Between main computer and remote monitoring unit using appropriate software via phone, cellular, radio or satellite systems.
Hardware and Software	Main computer (to act as a monitoring/control station). Remote monitoring or Supervisory Control and Data Acquisition (SCADA) unit used for data collection and/or system control. Software interface to communicate with the hardware.

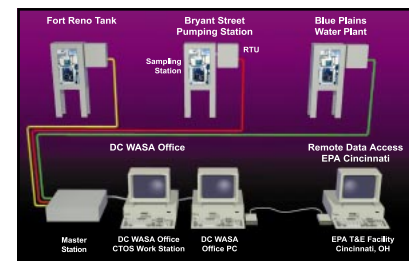


Fort Reno Tank

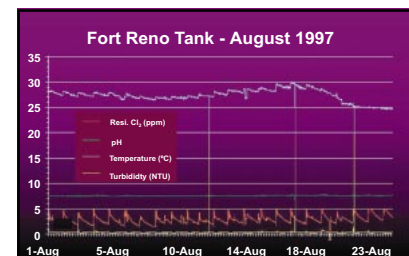


Sampling System/
SCADA Unit

Schematic Layout of Washington, D.C. Remote Monitoring Unit.

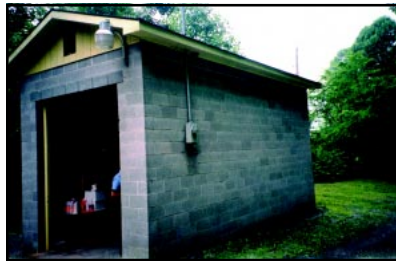


Sample Remote Monitoring Data Log.



System Design and Implementation:

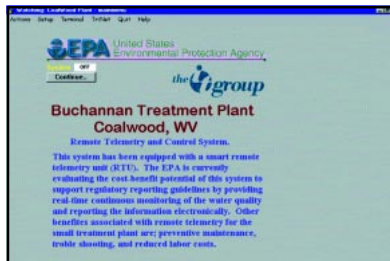
The design of the system depends upon location, availability of existing electronic hardware for remote communication, types of communication media available at that location, parameters proposed to be monitored, system scalability and desired networking options. Costs vary significantly based on these requirements. Newer Windows based systems are very user friendly and provide enhanced features including trends, alarms and summary reports. During implementation it is essential to provide proper training to on-site personnel and ensure that periodic sensor/instrument calibrations are performed for data validation.



Coalwood, WV Treatment Plant Location.



Ultrafiltration Treatment System.



Remote Communication Software Interface.



Remote Monitoring/Control Interface.

Remote Monitoring System Benefits:

- Long-term real-time remote monitoring can provide data that can be used to significantly enhance treatment system operation and reduce system downtime.
- Can potentially lead to improved customer satisfaction and improved consumer relations.
- Can potentially be used to satisfy regulatory recordkeeping and reporting requirements.
- Can reduce labor costs (associated with time and travel) for small system operators.
- Provides the capability to instantly alert qualified operators of undesirable water quality and/or other changes in treatment system(s).
- Troubleshooting can be performed remotely, reducing downtime associated with repairs.
- Fully automated treatment systems can identify monitored parameter trends and adjust operating parameters accordingly.
- Can provide an attractive alternative to fixed sampling, operation and maintenance schedules.

EPA Contacts:

Roy C. Haught
 U.S. EPA Work Assignment Manager
 Water Quality Management Branch
 26 West Martin Luther King Drive
 Cincinnati, Ohio 45268
 Phone: (513) 569-7067
 E-Mail: haught.roy@epa.gov

Mark C. Meckes
 U.S. EPA Microbial Research Coordinator
 Microbial Contaminants Control Branch
 26 West Martin Luther King Drive
 Cincinnati, Ohio 45268
 Phone: (513) 569-7348
 E-Mail: meckes.mark@epa.gov

IT Contacts:

Sri Panguluri
 IT Corporation
 11499 Chester Road
 Cincinnati, Ohio 45246
 Phone: (513) 782-4893
 Fax: (513) 782-4807
 E-Mail: spanguluri@theitgroup.com

E. Radha Krishnan
 IT Corporation
 11499 Chester Road
 Cincinnati, Ohio 45246
 Phone: (513) 569-7063
 Fax: (513) 569-7707
 E-Mail: rkrishnan@theitgroup.com

