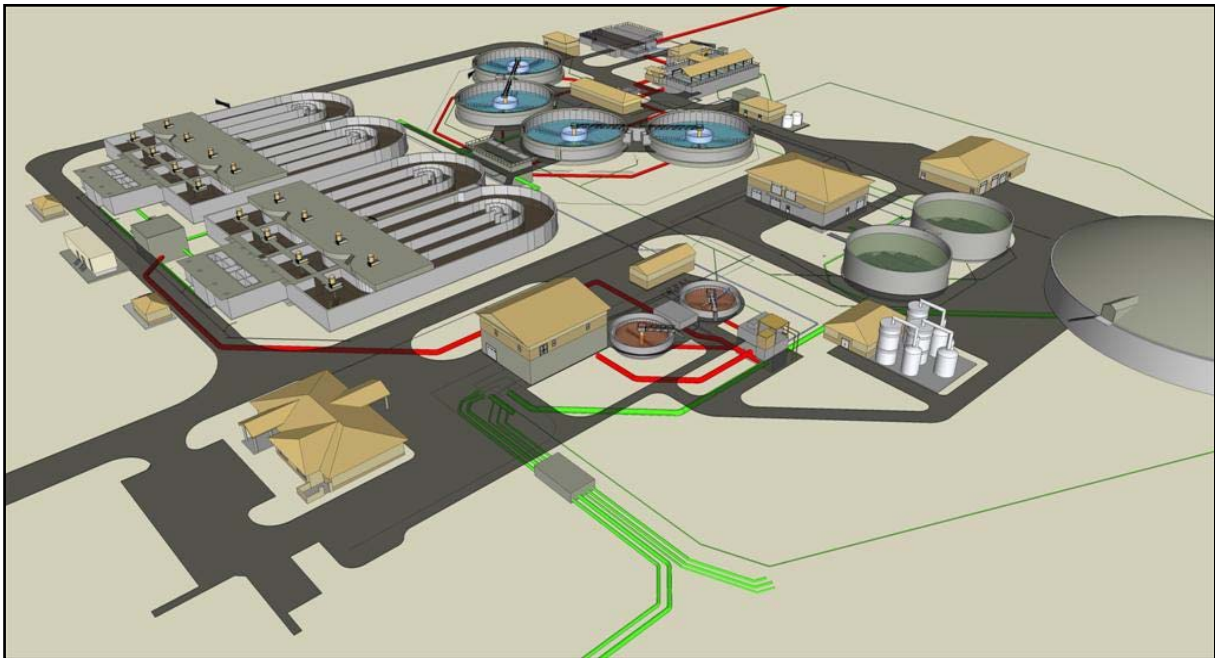




McGoodwin, Williams and Yates, Inc., has designed automation and supervisory control systems for several water and wastewater systems in Arkansas. The following projects highlight some of MWY's most recent experience in telemetry automation and supervisory control systems planning and design.

FAYETTEVILLE WESTSIDE WASTEWATER TREATMENT FACILITY FAYETTEVILLE, ARKANSAS

MWY designed the instrumentation and control system for the new Westside Wastewater Treatment Facility which went online in June, 2008. The distributed control system consists of thirty-two programmable logic controllers, two OLE for process control server computers, and two operator interface computer workstations. All of these system components communicate over a fiber optic Ethernet network. National Instrument's *Lookout* human-machine interface software is used to present the control system's information.



Fayetteville Westside Wastewater Treatment Facility

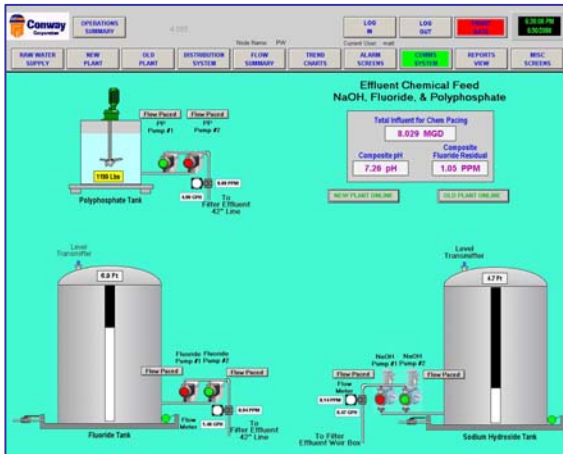
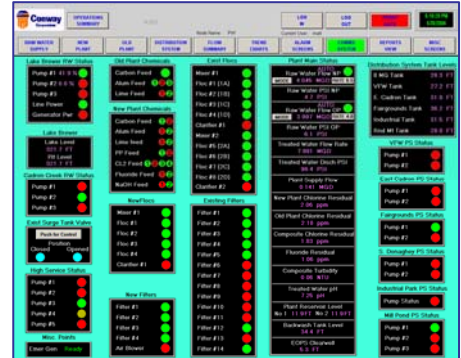
All of the plant's influent flow is pumped to the facility by remote lift stations. These lift stations are monitored and controlled utilizing wireless Ethernet remote terminal units and programmable logic controllers.

All of the influent flow and most of the internal process flow measurements are done with electromagnetic flow meters which provide continuous monitoring. Dissolved oxygen is continuously monitored in the biological process area and at the facility's effluent. Sludge blanket depth is continuously monitored in the final clarifiers. The facility's electrical power system is also continuously monitored by the distributed control system.

With the extensive control system the plant operations staff is able to manage the different processes within the plant. Current and historical trending of the plant's operating parameters enable the operators to make changes in the processes to maximize the efficiency of the plant and to maintain the highest quality effluent.

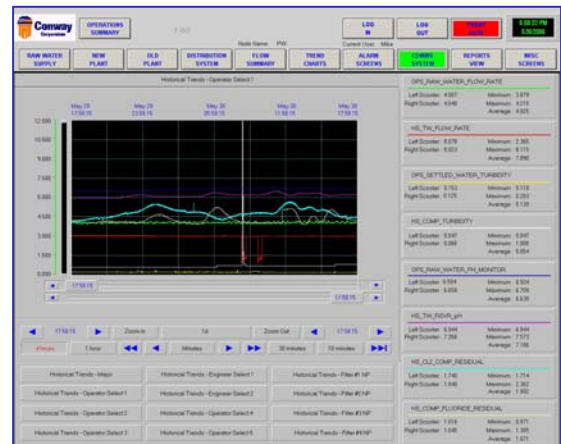
ROGER Q MILLS, JR. WATER TREATMENT PLANT CONWAY, ARKANSAS

MWY designed the instrumentation and control system for the new Roger Q Mills, Jr. Water Treatment Plant, which went online in July 2005. The system consists of three programmable logic controllers plus one remote I/O unit, two data warehouse servers and three operator workstations. All of these units are networked together with an underground fiber optic network. The plant control system is also interfaced using wireless Ethernet to the distribution SCADA system. The distribution SCADA system consists of nine remote terminal units.



With the control system, the plant operation staff is able to set chemical feed dosages in the treatment process. The operators are also able to increase and decrease the raw water flow rate using VFDs that are remotely controlled at Brewer Lake via the SCADA system. Plant operating parameters use *Wonderware* to create current and historical trending, which enables the operators to see water quality and demand

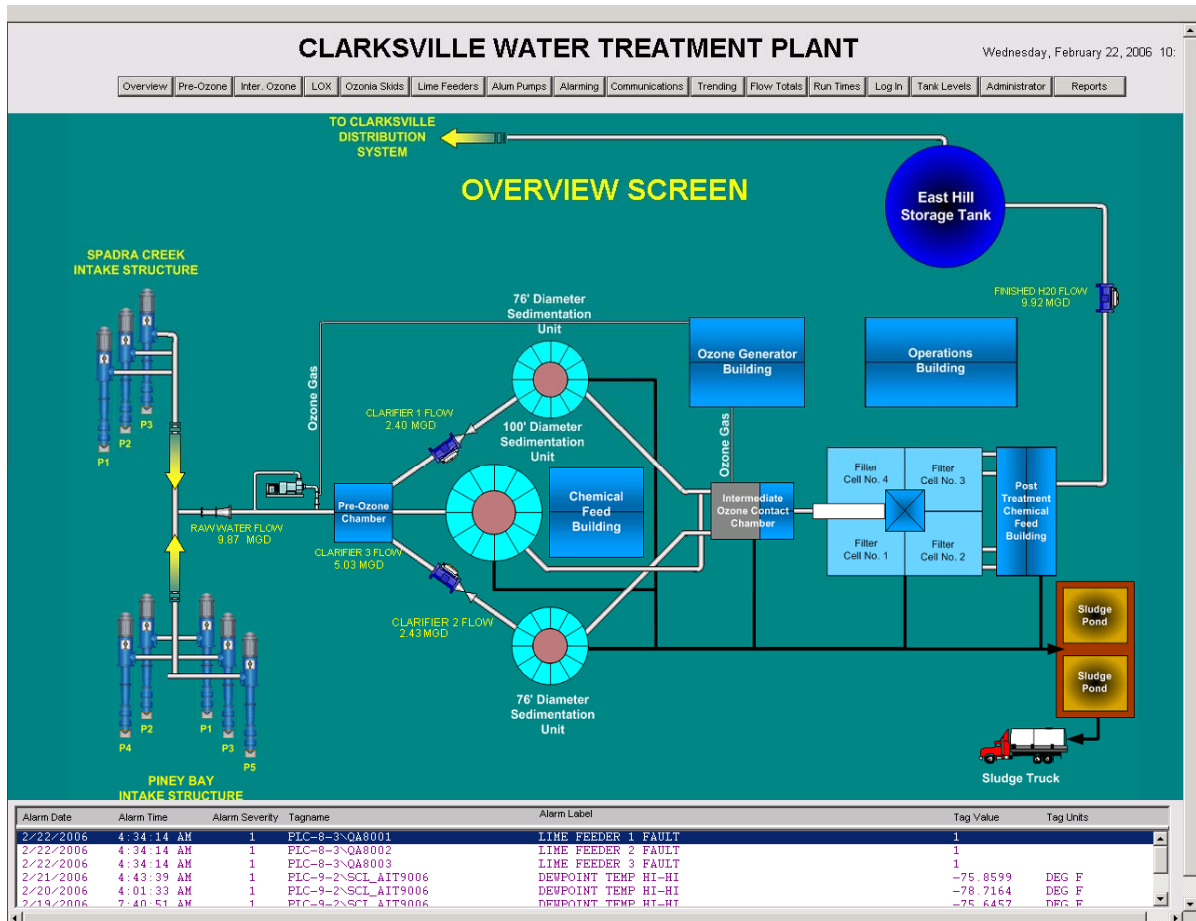
changes over time. Using the *Wonderware* HMI, the operator can view instantaneous values for pH, turbidity, rate of flow, chlorine residual and fluoride residual for treated water. All of the plant's operating parameters (chemical feed rates, instantaneous and total water flow rates, filter turbidities, etc.) are logged into a Microsoft SQL database. The database is used to generate daily and monthly operational reports.



PINEY BAY WATER SUPPLY AND TREATMENT FACILITIES CLARKSVILLE LIGHT AND WATER, CLARKSVILLE, ARKANSAS

MWY completed plans and specifications for a new water supply and treatment facility for the city of Clarksville. The project consisted of construction of an intake facility on Piney Bay and an impoundment created by the Arkansas River Navigation Project, along with approximately 40,000 feet of 30-inch diameter raw water pipeline and an advanced 8-MGD water treatment facility.

In order to monitor and control both the raw water intake, pumping facilities and potassium permanganate feed from the main plant, MWY provided a radio telemetry system with a central processing unit with microprocessor-based supervisory control and data acquisition system. Monitoring at each raw-water pump station includes wetwell levels, raw water turbidity, pacing of potassium permanganate feed pump, control of three raw water pumps, monitoring pump status and power failure condition, and monitoring of pump station intrusion for security.



Example Screen for Piney Bay Water Supply and Treatment Facilities

In addition, an ozone generation control system was designed and provided, consisting of a microprocessor-based system to supervise operation of all ozone gas supply trains, generators, and emissions control systems. The system includes numerous analog signals, discrete dry contacts for local and remote indication, and performed math calculations using analog signals compatible with data logging. The filter controls include a single unit four-cell operating console with remote electromagnetic control provided by a programmable logic controller.

Recently, as a part of the main plant renovation, a distributed control system was designed and constructed. Programmable logic controllers were added to the chemical feed building, the ozone feed building, and to the main system operations building. The programmable logic controllers and the main plant human-machine-interface computer communicate over a fiber optic cable using Ethernet protocol. The plant is now only manned about 50 hours per week, but the distributed control system is capable of treating water on a 24-hour, 7-days a week basis by monitoring reservoirs in the distribution system and restarting the treatment systems as needed. The distributed control system monitors the treatment systems, and if any part of the plant treatment systems fails to operate correctly, the distributed control system will shut the plant down and alert the on call operator that the plant has shut down and needs his attention. The alarming system communications is accomplished with cell phone technology, which enables the operator to be free while he is on call. The alarms that are sent to the operator are preprogrammed voice alarms that tell the operator what the specific problem is before he reaches the plant.

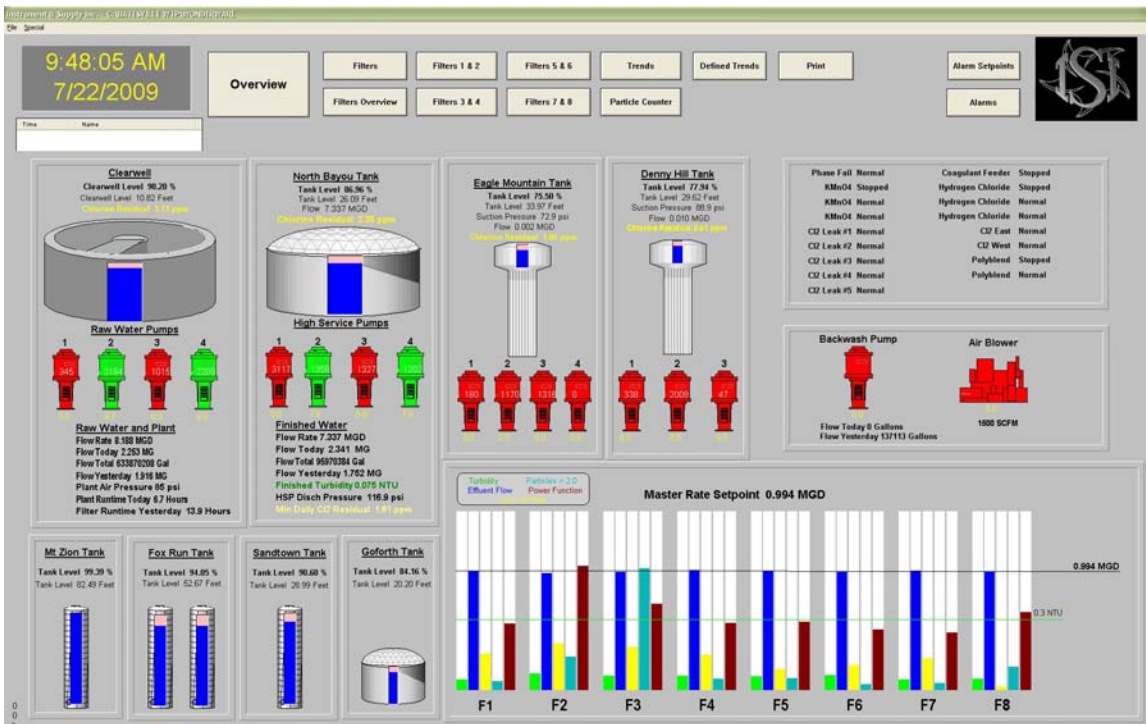
WATER TREATMENT FACILITIES

BATESVILLE WATER UTILITY, BATESVILLE, ARKANSAS

MWY completed the plans and specifications for expansion and upgrading of the existing water supply and treatment facilities to 12-MGD, including additional raw and finished water pumps, a new solids contact clarifier, upgrading of the existing clarifiers, new chemical feed building and associated equipment and reworking of existing filters (including new instrumentation and controls.)

The filter control system consists of a PC-based operator station specifically designed for use in a process control environment with all control and monitoring functions carried out in real time. The supervisory control station incorporated all of the functional capabilities required to communicate with a distributed system network, consisting of 32 control and monitoring instruments.

The supervisory control station is capable of generating application-specific CRT color displays. Data management functions include data logging, data archiving, point trending and interface to a host computer. Supervisory control system provided utilizes control microsystems programmable controllers communicating on a fiber-optic Ethernet network, Wonderware "Intouch" software, and Dell computer hardware.



Example Screen for Batesville Water Treatment Facilities