

## United Water's Challenge

**United Water** provides water and wastewater services to 12.5 million people throughout the United States, making it one of the nation's largest water service companies. According to the EPA, improvements to the nation's water and wastewater infrastructures will cost about \$260 billion over the next 20 years. Due to these escalating costs, many municipalities have chosen United Water to provide them with cost-effective solutions through either public-private partnership or facility management contracts.

**United Water New Jersey** (a subsidiary of United Water Resources) provides water services to approximately 753,000 people throughout the state. When their Mid-Atlantic division had a requirement for three flowmeters that could achieve high accuracy rates under less than ideal monitoring locations within their water processing plant, they contacted Marsh-McBirney (MMI). The flowmeters would be used to monitor water flow in the plant's finished, well, and surface water lines. Jim Mastrokalos, Superintendent for United Water Matchaponix, recalled that a trade journal advertisement indicated that MMI had designed a flowmeter for difficult to monitor locations including those with close proximity to bends, elbows and pumps.

The revolutionary **Multi-Mag** Magmeter provides multiple measuring points precisely positioned according to pipe size. Every sensor is "customized" to exacting measurements of the pipe on which it will be installed. The sensor utilizes proven electromagnetic technology. Unlike meters that provide only a single point measurement, the insertable sensor detects and compensates for shifting profiles. Its streamlined sensor shape minimizes flow disturbances, thus providing minimal pressure drop and requiring significantly less energy to operate than most flowmeters.



Prior to installation of the Multi-Mag, a differential pressure (DP) meter had been installed on the finished water line. Mastrokalos stated that "The DP meter could not accurately monitor the pipe's flow due to turbulent flows coming from nearby pump discharges and it's reading were disregarded. It was not even considered a viable option." DP meters are known to have inherent weaknesses when monitoring turbulent or pulsating flows. Under turbulent flow conditions, signal degradation can occur from noise caused by valves, fittings or by the element itself. Errors from pulsating flow can be caused by alternating pumps or compressors. Generally, errors up to 10% can be seen when the meter is installed in these scenarios. Therefore, manufacturers of DP meters recommend that their meters be installed as far away as possible from turbulent or pulsating flow sources, a luxury not available at United Water's facility. The Multi-Mag was

chosen for its ability to accurately monitor turbulent flows caused by the plant's pump discharges.

The Multi-Mag was chosen for its ability to accurately monitor turbulent flows caused by the plant's pump discharges.

The Multi-Mag installation for the well meter application would replace a turbine meter that could not accurately monitor bi-directional flow that occurred in the line. The monitoring site was also in the vicinity of a difficult piping arrangement that included bends and T's. Turbine meters are also known to be susceptible to disturbances caused by both upstream and downstream bends, elbows and valves. Mastrokalos further comments that "The Multi-Mag was also selected for this recharge well to allow United Water the simplicity of using just one flowmeter to monitor forward and reverse flow eliminating additional "bookkeeping" required if two meters were used at the site. Our goal is to get back to zero, so whether we go negative or positive we know where we are. We also use that Multi-Mag meter for pacing."

The third Multi-Mag installed on the surface water source pipeline was chosen for its installation convenience and construction cost savings. In lieu of costly installation alternatives, including either the addition of another pit or modification of the original piping, required for other types of flowmeters, the Multi-Mag was easily installed in the existing pit via a simple "hot top" installation. The surface water in this application contains a moderate iron concentration that eventually coats the sensor. Mastrokalos states, "Even with the coating on the sensor there was no degradation of signal. We clean the sensor every couple of months, just for the sake of cleaning it. After cleaning, we re-install the sensor and the meter reads exactly the same. It works surprisingly well even with a coating of iron on it."

United Water is very pleased with the accuracy and the simplicity of use of their Multi-Mag meters. According to Mastrokalos, "After the meters were put in service their accuracy was also checked against in-line orifice plates running simultaneously." He further comments, "I like the idea that the sensor is custom made for our pipe size. I definitely prefer them over single point type flowmeters that are only partially inserted over a percentage of the pipe. "

For years, United Water New Jersey has been recognized for using advanced, state-of-the-art technology to provide their customers with the highest quality water and service. That tradition continues today with the installation of the Multi-Mag meters at their Matchaponix facility.

For additional information contact McCrometer, Inc.  
Toll Free (800) 220-2279 • (951) 652-6811  
FAX (951) 652-3078  
[www.mccrometer.com](http://www.mccrometer.com)