



## UTILITIES/WASTEWATER CASE STUDY

# Washington County Conservancy District

St. George, Utah – Washington County Water Conservancy District (WCWCD) is a non-profit public agency established in 1962 to manage Washington County's water needs. WCWCD is responsible for reservoirs, pipelines, wells, water storage tanks, treatment plants, hydropower plants, and diversion dams located inside the district. Most of WCWCD water is sold at wholesale to the cities within the district. St. George is one of the cities that purchases water from WCWCD. The mission for the St. George Water Services Department is to effectively and efficiently manage and optimize the complete water cycle for the city of St. George.

### FreeWave Usage and Applications

St. George Water Services Department needed to find a way to collect reliable and accurate data from hundreds of I/O points scattered throughout an enormous and diverse topographical area. From their research, upgrading to a SCADA system would cover a wider area and provide a better overall network capable of transferring data in real time.

The first issue needing to be resolved was the protocol when transmitting data from one point to another. In the context of wireless M2M data communication, a network protocol is a formal set of rules, conventions and data structure that governs how computers and other devices exchange

information over a network.

The 'backbone' is typically a wireless M2M communications technology to allow for many data items to be transmitted bi-directionally at the same time. The St. George Water Services Department utilized FreeWave's HT-Plus Ethernet spread spectrum radios for the core of their wireless M2M communications network.

Next, in order to minimize cost without sacrificing performance, the city designed a system using FreeWave's cost-effective RGRIO and FGR series radios to handle single and low I/O data points using the ModBus protocol. Then these satellite cells were coupled together through a network of HT-Plus Ethernet radios to the Main Control PC that graphically displays the data and logs the important points at predetermined intervals. The HT-Plus radios have two serial ports that allow 'back links' for the serial data radios, enabling them to send data without converting it to an Ethernet protocol. The city also used PLCs (Programmable Logic Controllers) at control points and configures those PLCs to communicate through serial ports to ModBus devices using the FGR radios, before connecting to the backbone through TCP/IP ports.

## Outcomes

Using these methods of coverage, the St. George Water Services Department has a wireless M2M backbone system that is more than 100 linear miles in length, with branches covering many more miles. The I/O count is in the thousands, with more than two hundred data sites. The sites are a mix of utility-powered and solar-powered devices, with the solar sites designed to perform for several cloudy days without interruption of service. The combination of hardware with the ModBus protocol has also minimized the need to replace or upgrade existing field hardware.

The city also found that, more often than not, the larger metropolitan areas have more than one water district in the areas of coverage. To further minimize costs, local agencies have joined forces to form Memorandums of Understanding (MOUs) that will allow them to utilize the same backbone and/or data points, reducing duplication of effort. This has worked well with the ability to secure separate systems, passing only data contained in the MOUs from one to another.

## HIGHLIGHTS

- > The city designed a system using FreeWave's cost-effective RGRIO and FGR series radios to handle single and low I/O data points using the ModBus protocol.
- > The St. George Water Services Department utilized FreeWave's HT-Plus Ethernet spread spectrum radios for the core of their wireless M2M communications network.
- > Using these methods of coverage, the St. George Water Services Department has a wireless M2M backbone system that is over 100 linear miles in length, and branches covering many more miles.



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