WATER TREATMENT PLANT NO. 2

Electrical Modifications and Improvements & Chemical Feed Modification Project
PN: 5-C-028-20 & 5-C-026-20

MAJOR FINDINGS OF STUDY

- Installation of Secondary Power Feed from Evergy
- Reuse of existing generator at WTP2
- Installation of Medium Voltage Power Feed Loop
- Installation of two smaller generators for Collector Well Field
- Internal communication fiber and Wonderware software upgrades
- Chemical ductbank
- Chemical modifications and improvements

DID YOU KNOW?

- Original WTP2 constructed in 1964
- In 2020, WTP produced nearly 4.58 billion gallons of drinking water
- Olathe obtains raw water from collector and vertical wells in the Kansas River

RELIABILITY AND REDUNDANCY

Regulatory compliance and dependable operation are Environmental Services' top priorities for providing safe drinking water and a reliable fire protection system for the residents of Olathe. These projects will address redundancy, reliability and capacity of the plant's electrical and chemical systems at the plant and provide a reliable system to stabilize plant operations.

These projects include the replacement of the fiber communication network and placement of this key component into a protective concrete ductbank. Electrical feed is proposed to be looped around the facility with a medium-voltage service loop. This proposed upgrade for a reliable and redundant power feed loop will install multiple transformers throughout the site and allow for more localized power step-down while removing the reliance on one motor control center and transformer for a single point of failure.

Olathe's summer average daily usage is 17.06 million gallons per day (MGD) with the average summer usable storage of 8.82 million gallons (MG). Fire Protection requirements allociate 1.26 MG or 14.3% of summer storage. If WTP2 were to lose power needed for production of water during summer months, the system would only have 11 hours until we would be forced to purchase emergency water from WaterOne. Olathe's winter average daily usage is 10.5 MGD.

REGULATORY COMPLIANCE

Drinking water treatment is highly regulated by the EPA and KDHE. The City of Olathe completed a Risk and Resiliency Assessment, as required by the EPA, in 2020. The assessment found that backup power and electrical improvements are critical for maintaining service from the well fields and water treatment plant. When WTP2 experiences power failures or "blips" in the power feed, two control operators must cross-check the entire system within the facility to ensure the equipment is running and operational. These operators have been taken away from ensuring continued compliance with drinking water regulations and forced to ensure pumps, control panels and chemical feed pumps are correctly operating.

DIRECTION FINDER RESULTS

- Overall Satisfaction with Water Quality is at 84.3%
- Top Performer for Water services within the Nation with a Population over 100K

PROJECT COST

- Electrical Distribution – 38.2%
- Backup Power – 22.2%
- PLC's/SCADA – 16%
- Misc. Chemical Feed – 23.6%
- Project Construction Budget $14.27M

PROJECT DRIVERS

- Existing back-up power at WTP2 can only provide the winter average day demand, which is 10.5 MGD
- Electrical system is currently in a "daisy-chain" schematic

Currently, WTP2 experiences about 5 outages per month during peak summer demands that would total 4.5 hours of down time.

Improvements associated with chemical feed equipment and chemical storage and handling are some of the proposed safety and regulatory improvements associated with the Chemical Feed Modifications Project.

These projects will ensure our 2021 treatment process and equipment is not fed by a 1964 electrical system. Safeguarding the facility to meet current and future needs is the primary focus of these projects, while providing the flexibility and seamless operations of our drinking water plant.

OPERATIONAL CHALLENGES AND IMPROVEMENTS

Plant Operations, on average, experiences over 36 outages per year. Each outage requires at least two control operators a minimum of 45 minutes to "reset" the electrical components within all plant facilities.

The current communications fiber is directly buried within the plant facility and is easily damaged with ground shifts or construction activities. The fiber communication is integral with keeping the operators informed on treatment performance and ensures compliance with Water Quality parameters for residents.

Below is a diagram of the current electrical layout and demonstrates the "daisy-chain" of the electrical power within the plant site.