

# CHAPTER 10

## GRAINGER RESERVOIR

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### BACKGROUND

The Grainger Reservoir was constructed in 1998 and consists of a 600,000 gallon cast-in-place concrete reservoir with an attached pump station, as shown in Figure 10-1. The pump station includes (2) 312 gpm and (2) 1,500 gpm water supply booster pumps, as shown in Figure 10-2.



**Figure 10-1**  
Grainger Reservoir Exterior



**Figure 10-2**  
Water Supply Booster Pumps

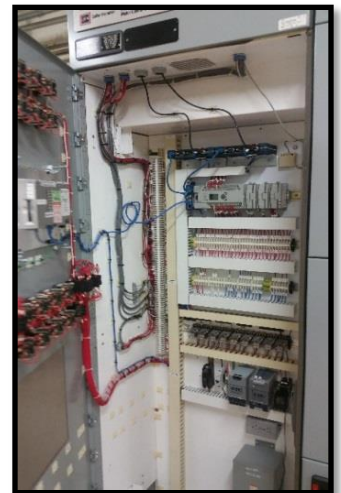
### RECOMMENDATIONS

#### SCADA System

Figures 10-3 and 10-4 show the existing control panel and SCADA system. The LCPWD installed a radio telemetry system in the Grainger Reservoir in 2013 that transmits to the existing Water System Control Panel located in the operations building of the Vernon Hills WRF. It consists of a MDS/GE 900 MHz spread spectrum radio and an Ethernet switch. The radio is operational and links back to the Vernon Hills WRF.



**Figure 10-3**  
Existing Control  
Panel Interior



**Figure 10-4**  
Existing Control  
Panel Exterior

It is recommended that a new SCADA PLC be installed at the Grainger Reservoir. The panel would include:

- Replacement of the Existing MicroLogix 1400 PLC with an Allen-Bradley CompactLogix L33ER PLC
- (4) 16-point digital input cards
- (4) 4-point analog input cards
- (2) 16-point digital output cards

A 15-inch touchscreen on the front of the panel will provide control and display local data. An uninterruptible power supply (UPS) will maintain PLC function and data transmission in the event of a power failure. The existing Ethernet switch will be utilized to connect the new PLC to the SCADA network to provide control, status monitoring, and alarm monitoring data to the Master SCADA PLC at the Vernon Hills WRF. Information on the recommended SCADA equipment can be found in Appendix E.

Similar to the South Delivery Structure and the Corporate Woods Reservoir, we recommend replacing the existing pressure transducers, which are almost 20 years old.

## **Miscellaneous**

The Grainger Reservoir currently has a fire alarm system installed that the LCPWD subscribes to have serviced and monitored. We recommend adding SCADA annunciation from the fire panel, but leaving the fire panel connected to the Fire District for the time being.

## **CAPITAL COSTS**

The estimated capital costs for the recommended SCADA system improvements are shown in Table 10-1. It includes contingencies, engineering and administration.