Technical Memorandum

Blanco Drain Diversion Pump Station

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This document is intended to provide an overview of the Blanco Drain Diversion Pump Station events, where the pump station temporarily operated out of band from the maximum permitted diversion flow rate.

Background

The Blanco Drain Diversion Pump Station ("pump station") was initially commissioned during the week of January 23, 2020. During the commissioning efforts, functional tests were performed to verify that the pump station functionally operated within the permitted constraints outlined within the water rights permit, including verifying that the automated controls in-place limited the pump station maximum diversion rate of 6.0 cfs. Various other tests, including operating the pumps in local manual control in various pumping configurations were also performed to verify proper pump station operation.

Subsequent to the initial commissioning efforts, and while M1W was performing operational testing of the pump station, it was noted that there were reported momentary occurrences where the pump station exceeded a pump rate of 6.0 cfs.

Upon examination of the pump station automated controls, it was determined that the Programmable Logic Controller (PLC) Central Processor Unit (CPU) that normally controls the pumps was operating at the upper-end of it's available memory, was periodically and momentarily not properly executing control of the pumps as required, resulting in momentary pump rate exceedance of its programmed maximum diversion flow rate.

Subsequent to noting the issue with the PLC CPU, M1W upgraded and replaced the PLC CPU to a version with greater installed memory, rectifying the pump rate limit momentary exceedance issue. The PLC CPU was replaced on October 29, 2020 and tested to verify proper operation, including verifying proper control of the diversion flow rate.

It should be noted that as a precaution to eliminate operator error, there are programmed limits within the PLC program that prohibit operators from exceeding the stipulated maximum flow rate of 6.0 cfs when operating in an automated mode. However, if during testing with the pumps operating in a manual local mode from within the pump station, with multiple pumps operating at maximum speed, the stipulated maximum diversion flow rate can exceed 6.0 cfs. During commissioning efforts, it was noted that each pump, when operating at maximum speed is capable of diverting approximately 3.2 cfs.

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