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February 23, 2015
C-18966

Fort Cherry School District
110 Fort Cherry Road
McDonald, PA 15057

Attn: Dr. Jill Jacoby, Superintendent

Subject: Water System Report & Evaluation
110 Fort Cherry Road
McDonald, PA 15057

BACKGROUND

The following is a general description of the water system at the Fort Cherry School District campus:

The current water supply for the system is from Pennsylvania American Water Company (PAWC). There is a Main Booster Pump Station that is situated along Fort Cherry Road approximately 2,730 feet from the intersection with Chiarelli Lane, which is the entrance to the Fort Cherry School campus. The water is pumped through a 6-inch cast iron pipe (CIP) line to a valve pit at the base of an Elevated Water Storage Tank. The tank contains approximately 100,000 gallons of water and sets on the school campus approximately 1,400 feet from Fort Cherry Road. The upper capacity level of the water tank is 78 feet from the base. Water is distributed from the elevated tank to the various campus buildings which consist of a High School, an Elementary School, Administrative Building and Athletic Facilities.

The water booster pump station, water distribution system and water storage tank were originally constructed around 1958. The High School building appears to be the oldest building on campus. The Elementary School and Administrative buildings were constructed at a later date. The High School building is a two story facility with a lower level boiler / mechanical area. There is a water meter on the incoming service line for that building. The High School building has its own water booster pump that increases and sustains a pre-set pressure providing the appropriate flow to the building. The Elementary School building is a single story facility with a lower level mechanical area. There is a water meter on the incoming service line for that building as well. This building does not rely on a separate water booster pump to maintain pressure and flow to the

building. The pressure provided by the elevated tank sustains adequate service to the facility provided that the elevated tank is kept at its maximum capacity level.

The Administrative Building is serviced by the Elevated Water Storage Tank. In addition, a separate water line tees off the 6" CIP booster pump feed line and runs to the Athletic Facilities.

OBSERVATIONS

The Main Booster Pump Station building is in poor condition. The piping, valves, pumps and controls are in poor condition as well. The piping is severely corroded and the pump seals appear to be leaking constantly. The controls show severe wear due to the damp conditions within the pump station and are outdated.

The water line from the Main Booster Pump Station along Fort Cherry Road is a 6" cast iron pipe (CIP) it runs from the booster station to a valve pit at the base of the Elevated Water Storage Tank. That line is reported as being in poor condition evidenced by several breaks that have been repaired over time.

We are not sure of the type and condition of water line from the elevated tank to the High School but since it is the oldest building it is presumably cast iron pipe and most likely in poor condition as well. The size and condition of the water pipe lines to the Elementary School and the Administrative Buildings is unknown. Being constructed well after the original facilities were installed it is most likely those lines are not CIP. Cast iron pipe is a concern because it is subject to stress breaking and can corrode under certain conditions due the composition of the pipe material whereas ductile iron pipe, PVC pipe or HDPE pipe have greater resistance to those conditions.

The size and type of the water line to the Athletic Facilities is also unknown. That line connects directly to the 6" booster pump feed line along Chiarelli Lane before it reaches the main campus area and runs directly to the Athletic Facilities. This water line also relies on the pressure created from the Elevated Water Storage Tank and the flow is subject to the size and condition of the pipe line that services those facilities.

EVALUATION

Gateway has evaluated the new 12 inch waterline from PA American that services the fire hydrant at the entrance to the school facilities to determine the benefits of a direct connection to this line, in lieu of the booster pump station that currently services the complex.

A flow test was performed on 9/15/10 to determine the available volumes and pressures on the new system. Based on this data and the assumption for the installation of a 6 inch line from a meter vault at the main school entrance to the Elementary School and High Schools resulted the in following:

Parameter	Elementary School	High School
Current Pressure Provided by Tank	35 psi	40 psi
Current Operating Pressure	35 psi	86 psi
Proposed Static Pressure	68 psi	66 psi
Proposed Pressure at Average flow	53 psi	50 psi
Proposed Pressure at Peak Flow	18 psi	6 psi

Based on the above results, it appears as though the new line will provide increased pressure to the school facilities, however as the flow rate increases toward the peak usage, the volume provided is not sufficient to supply the facility needs. In order to accommodate the school facilities needs we recommend the following improvements. An opinion of probable cost for the recommended improvements is attached.

- Installation of new water meter vault near entrance and abandonment of existing sewage booster station.
- Install a new 6" water service line to the facility along the entrance road to connect to the Athletic Facility, Elementary School and Elevated Storage Tank.
- Install altitude valve on tank to control tank fill levels from public system
- Maintain existing High School pump to boost pressure in building while pulling from tank.
- Install cross connection with check valve to allow tank to provide excess flow to Elementary School during peak demands.
- Complete an internal inspection of the existing water tower.



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Respectfully submitted,

THE GATEWAY ENGINEERS, INC.

Bryan W. Flaugh, P.E.
Project Manager

Enclosure

cc: Jessica Drylie, Substitute Business Manager