

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

In the Matter of Hickory Hills Water and Sewer Co., Inc. Small Company Rate Increase.)

Case No. WR-2009-0151

STAFF REPORT OF WATER SYSTEM OUTAGE AND REPAIRS

COMES NOW the Staff of the Missouri Public Service Commission (Staff), by and through counsel, and submits its Report of Water System Outage and Repairs for the Missouri Public Service Commission's (Commission) information, stating as follows:

1. On March 4, 2009, the water system of Hickory Hills Water and Sewer Company, Inc. experienced an outage event lasting from mid-day until approximately 10:00 p.m. the same day, when sufficient initial repairs were completed to allow water service to re-commence.
2. Attached hereto, as Appendix A, is Staff's Report on the Water System Outage and Repairs outlining the incident, subsequent repairs, and future implications for the water system.

WHEREFORE, Staff respectfully submits this report for the Commission's information.

Respectfully submitted,

/s/ Shelley Syler Brueggemann

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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing have been mailed, hand-delivered, transmitted by facsimile or electronically mailed to all counsel of record this 6th day of May 2009.

/s/ Shelley Syler Brueggemann

Report of the Public Service Commission Staff

Water System Outage and Repairs Hickory Hills Water and Sewer Company, Inc.

Prepared by:

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Water and Sewer Department
May 5, 2009

Background

Hickory Hills Water and Sewer Company, Inc. (the Company or Hickory Hills) provides water and sewer service to two (2) adjacent subdivisions in Moniteau County, located along Highway 50 just west of the city of California. The Commission granted authority to the Company to provide water and sewer service in Case Nos. 18205 and 18206, respectively, both of which were closed on January 31, 1975.

The Company has had several owners over the years. A receiver, Mr. Gary Cover of Clinton, MO, was appointed by Judge Beetem in the Cole County Circuit Court on January 2, 2007, and is currently managing Hickory Hills' systems.

The Hickory Hills sewer system consists of a single cell lagoon with a gravity collection system. The water system, which is the subject of this report, consists of a single well, a series of nine (9) small pressure tanks, distribution system, and meters for the forty-eight (48) residential customers. The Company employs Mr. Kyle Wirts as the water facility operator. Mr. Wirts is employed full time as an operator with the City of California, and operates the Hickory Hills system after normal work hours. There is no emergency connection to any other water supply system.

Overview of the Outage Event

John Gibson of the Missouri Department of Natural Resources (DNR) Northeast Regional Office in Macon received a call from Mr. Wirts on Wednesday, March 4, 2009. Mr. Gibson was informed that the well pump had failed, and, apparently, during this failure some check valves installed in the well piping apparently did not hold, resulting in water flowing back into the well. This downward flow of water created a vacuum in the water system, collapsing the pressure tanks in the wellhouse along with inflicting damage to some piping in the well house. On Thursday morning, March 5, 2009, Mr. Gibson contacted Deana Cash in DNR's Public Drinking Water Branch office in Jefferson City. Ms. Cash and John MacEachen of the same office contacted Jim Merciel about the event. The Staff subsequently called Mr. Cover Thursday March 5, 2009 for additional information about the event and for an update on the current status of the system and its operation. Mr. Cover advised that Mr. Wirts had taken vacation time from his regular job the afternoon of March 4, 2009 to work on this outage, and that they contacted Tom Schroeder of Schroeder Rotary Drilling and Pump Company of Cole Camp, MO who came

on site approximately 4:00 pm March 4, 2009 to evaluate and work on the problem. Mr. Wirts obtained fifty (50) cases of bottled water, purchased by the Company, and delivered a case to the front door of each of the customers that evening. Additionally, it was reported that the Company requested Opies Trucking of Eldon, MO to be available to truck potable water to the site if needed, although such option fortunately never became necessary. Mr. Schroeder, working that evening, was able to by-pass damaged parts of the system, temporarily install two (2) pressure tanks, do an electrical repair, and get the system running again by approximately 10:00 pm March 4, 2009. Mr. Schroeder, initially, planned to return on Friday, March 6, 2009 to install additional pressure tanks similar to the pre-existing arrangement, though the permanent repair ultimately did not occur until Monday March 9, 2009.

The Staff also contacted Mr. Schroeder to discuss what he observed to have been the problem. Mr. Schroeder stated that the failure was actually caused by a problem with the electric controls in the well house, not a failure of the pump itself which is located at the end of a "drop pipe" extending several hundred feet down into the well.

The Company notified residents of the situation, and imposed a "Boil Advisory" upon its customers until further notice, meaning until new components were in place and disinfected and until water test results come back as safe residents were to boil water.

An early report of the outage was logged by a customer on the Commission's EFIS system during the evening of March 4, 2009, simply stating that they were out of water. However, upon contacting the customer the first thing the next morning, March 5, 2009, this customer informed Staff that water came back on later in the evening, after the Public Comment was filed.

Discussion

An early report of the possible cause of the outage involved the combination of the well pump failure to start with failure of the "foot valve" (a check valve located at the well pump) and another check valve, located at the well discharge piping in the well house, causing water in the well pump column to drain back down the column, eventually resulting in the vacuum and collapse of the tanks. However, during a discussion with the Staff on Thursday afternoon, Mr. Schroeder stated that he believed that normal customer usage could have caused the vacuum since the subdivision is on a hillside.

It is likely that several factors led to this outage, including some of the tanks being in a condition known as "waterlogged." Pressure tanks operate only partially filled with water, with an air cushion that remains under pressure. Over time the air can become absorbed by the water resulting in the tanks being nearly completely filled with water, preventing them from allowing the well pump to operate effectively within a pressure range. Checking for a waterlogged condition, and using an air compressor to recharge the air cushion, is an operational task. While it is possible that some of the tanks could have been in this condition, a number of the pressure tanks were "bladder tanks," which have a rubber membrane between the water and air that prevents the suspect air absorption. It is

therefore not possible to determine after the fact exactly what state the system was in, and to what extent waterlogged tanks could have contributed to the problem.

Another possible source of the problem could have been the above mentioned check valves. Typically there is a "foot valve" in the well at the bottom of the drop pipe, one or more additional check valves along the length of the drop pipe, and one check valve at the top of the well in the wellhouse. With this system in receivership and the owner uninvolved, it is not known what check valves exist within the well, or their condition. Inspection of these check valves requires pulling the drop pipe and pump out of the well, which is costly and would require approximately another day of the water system being shut off in order to do this work. In the Staff's opinion, it is not critical to pull the well pump in order to examine the setup of the system, because the system can be set up to operate with a new check valve at the well head where it is accessible. Eventually, the pump will need to be repaired or replaced, and at that time the system will be shut down to accomplish that work, and, the check valves can be observed and replaced as necessary. Until then, the Staff concludes that we will not know the extent to which the check valves might have contributed to the problem.

Although this event potentially could have caused damage to water mains and customers' facilities such as water heaters, the Staff has no indication that any damage occurred beyond the piping and tanks in the well house.

Remedial Action

Prior to his telephone discussion with the Staff, Mr. Schroeder spoke with Everett Baker of DNR's Northeast Regional office. Mr. Baker had some suggestions for tank and piping arrangements that would improve chlorine disinfection. In order to undertake the tank replacement to include these suggestions, Mr. Schroeder needed some additional parts, and thus decided that he could not accomplish the repair on Friday March 5, 2009, but rather would begin Monday morning March 9, 2009. The Staff's discussion with Mr. Schroeder included discussions of Mr. Baker's suggestions, check valves and the arrangement of the valves at this system, installation of a vacuum breaker (a device to allow air into the system and forego damage should a similar event occur in the future), and some long-term ideas for storage and improved reliability. The long-term improvements though desirable, require more planning, engineering, approval, and financing than could be facilitated at this time.

Jim Merciel and Martin Hummel went to the system late in the morning on Monday, March 9, 2009, while repair work and installation of the new tanks was under way. The old tanks had already been removed from the site, but the old piping and one check valve were lying outside the wellhouse to be discarded. The customer that lives next door to the wellhouse had taken pictures of the damaged parts, and provided copies of the pictures to the Staff while on site, and also to DNR. Mr. Baker from DNR was also on site later that day after the Staff had left. The Staff spoke with Mr. Baker on Tuesday, March 10, 2009, about the problem, opinions on what might have happened, and the repairs that were accomplished.

The repairs were completed some time Monday evening March 10, 2009. Subsequently, the system was disinfected and turned back on, with the Company's boil advisory still in place. According to DNR, test results of water samples taken by the Company were returned on March 17, 2009 indicating the water was free of bacteriological contamination, and permitting the Company to lift the boil advisory.

The cost incurred by Hickory Hills for Schroeder to accomplish the temporary repair and permanent tank replacements was \$9,601, and the cost of the bottled water was \$192.23. There was also some additional cost for the operator's extra time spent on this matter, and some travel expense to acquire the bottled water.

Conclusion

The Staff believes that the receiver, the hired operator, and the well driller took proper and timely post-failure action, in order to address the problem with the system. The repairs undertaken include one replacement check valve, a new vacuum breaker device that would prevent damage should a similar failure occur again in the future, and minor modifications that improve the chlorine disinfection process. After much discussion, the primary cause of this outage is not able to be determined at this time because all of the facts that contributed to the catastrophic damage are not yet known for the reasons described above.