

MEMO TO: Richard Healey, ADEQ  
Dennis Taylor, AR Dept of Health (ADH)  
Bobby Pharr, ENTERGY

FROM: Gary Carnahan, P.E., Hot Springs City Engineer

CC Stephen Youngblood, ADH  
Jason Gilkey, ADH  
Bill Burrough, Hot Springs City Manager  
Scott Bundy, Hot Springs Utility Director  
Bobby Harris, Hot Springs Utility Operations Manager

Regarding the force main break yesterday, Scott Bundy has asked me to continue communicating with ADEQ, the Department of Health and Entergy so that you are well informed of the situation and our remediation measures.

Since the repair is now complete, we have had time this morning to review more of the project details. The pipe break occurred while our crews were on the job to repair a leaking bell gasket joint in our "new" 20" PVC force main.

As a first step this morning, we reviewed our standard operating procedures and affirmed that our utility operations staff did follow SOP for the repair. They had the repair pipe and materials on the job, and they had adequate manpower, machinery, and equipment on site for the repair. They had planned for incidental water loss during the repair by having two 2800 gallon pumper trucks on site. They had shut off the Fairwood Lift Station for the anticipated short repair period. In the event of a delay in the repair, they had changed the Fairwood side (up-pipe) valves so the Fairwood LS would pump through the bypass main if necessary. When we installed the new main, we left the old 15" main in place so it could be used as a backup or bypass main if necessary. They had also closed the 20" butterfly valve just 600 feet east (down-pipe) of the repair section. So, they believed that the repair section was isolated from any flow.

We also reviewed the volume of water that was lost during the break and the amount that might have entered the lake. The break occurred at 12:45 pm and the water flowing from the pipe was stopped at 1:10 pm. The water was stopped by closing a 24" valve that is located about 800 feet farther down-pipe. The spill from the break occurred because the 20" butterfly valve closest to the repair section did not fully close. Twenty five minutes passed until we realized that the valve must be partially open and then closed the 24" valve. The 1400 feet of pipe up to the next high point in the line contained 22,845 gallons. Additionally, between the break and the 24" valve there is a pump station that pumps 800 gallons per minute. We checked the pumping records and found that it pumped for ten minutes during the time of the break. Since the 20" valve was partially closed, we are assuming that at least half of that flow travelled down-pipe as normal, but that possibly half of the flow went up-pipe to the break. That would have added an additional 4,000 gallon to the pipe volume, so the estimated volume of the spill was 26,845 gallons.

Wastewater from the broken pipe traveled over that 25 minute period, into the road ditch, across gravel and paved parking areas, and through grassed swales for 600 feet toward a seawall on Lake Hamilton. The wastewater collected in the ditches and low areas along that 600 feet. The standby pumper trucks were able to collect and remove 20,000 gallons (ten loads at 2,000 gallons per load) from those areas

before it entered the lake. Some of the wastewater also soaked into or was trapped by the grass and gravel areas and did not enter the lake. The grass also trapped the debris from the spill. Consequently, we did not see any floating debris or any gray, cloudy, or discolored water in the lake.

We are now implementing the following actions:

- We have collected lake water samples and are having them analyzed for fecal coliform, e. coli, and dissolved oxygen. If there are negative sample results, we will continue monitoring.
- We will hire an independent emergency clean-up contractor to remove any contaminated soils, gravel, etc and restore surfaces to their previous condition.
- We will review our SOP and amend it to include additional precautions for future main repairs (for example, double valve isolation).
- We retained the broken pipe and will have it tested by an independent lab to see if there is an identifiable cause of the rupture.
- We will continue to maintain open communication with ADEQ, the Department of Health, and Entergy.

Once again we sincerely regret this unexpected event and will continue remediation measures to safeguard public health and the water quality of Lake Hamilton. We will also try to learn as much as possible from this event and use those lessons learned in the future.