



A Case Study of the Emergency Response for a Mid-sized Water System

Robert J. Compton, P.E.
Water Supply Engineering Section
Drinking Water Branch, Water Division

Water System Overview

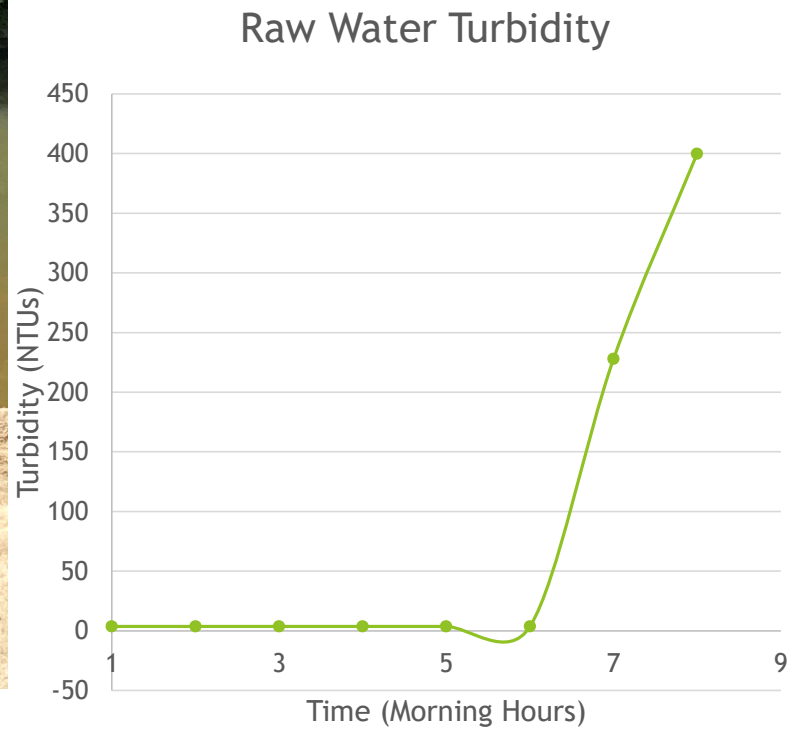
- ▶ Community Water System
- ▶ ~3,500 Service Connections
- ▶ Single Source
 - ▶ Buttahatchee River @ 2.0 MGD
 - ▶ No purchase sources available
- ▶ Traditional treatment
 - ▶ Intake → Mixing → Flocculation → Settling → Filtration → Clearwell
- ▶ Total Storage (3.7 MG)
 - ▶ Clearwell with 336,000 gallons
 - ▶ 9 Storage Tanks with 3,350,000 gallons
- ▶ Water Sold (1.06 MGD)
 - ▶ Hamilton: 870,000 gpd
 - ▶ Guin: 16,000 gpd
 - ▶ Marion: 175,000 gpd

The Problem

- ▶ Thursday August 24 @ 9:22AM
 - ▶ Plant Operator noted unexpected raw water turbidity increase to 400 NTUs (typical is <10 NTUs) and notified utilities manager.
- ▶ 10:49AM
 - ▶ Operator decided to shut down the plant for two reasons:
 - ▶ Unknown source of turbidity.
 - ▶ Doubts that the plant could continue to produce water compliant with drinking water standards.
- ▶ Tanks are at or near capacity, providing about 3.5 days of water for direct and purchase customers before service/pressure loss becomes imminent.



Buttahatchee River Under Normal Conditions



Buttahatchee River on August 25, 2023

Day #1 - Initial Response

- ▶ The Water System immediately contacted local EMA, local law enforcement, Hamilton's mayor, and their ADEM inspector to inform all parties of the incident and the potential severity.
- ▶ The Water System cleared the intake to obtain real time grab samples from the river.
- ▶ Water System personnel as well as the local Fire Department began scouting for the source of the turbidity incursion using drones, ATVs, and men on the ground.
- ▶ Clifty Creek, a small tributary upstream of the intake, was identified as the source. However, all efforts were halted once evening came.
- ▶ The main water storage tank is sitting at 40%

Day #2 - Morning

- ▶ EMA, the Mayor, Sherriff, County Engineer, Superintendent of Schools, the local State Representative, a State Senator, Alabama Rural Water and all levels of ADEM leadership are involved.
- ▶ The City declared a State of Emergency
- ▶ Local community is assisting in spreading awareness as well as organizing bottled water deliveries. The City has a media specialist tasked with informing all customers of any precautions or updates.
- ▶ Public Schools are closed for Friday August 25.
- ▶ Early Friday morning, a State Trooper helicopter was able to identify the source of the incursion at a private dam that had failed during a rehabilitation project.
- ▶ The dam burst open unexpectedly and poured silt and clay into Clifty Creek 11 stream miles from Buttahatchee, 1 stream mile upstream of the intake. (14 hours of flow time from the incursion to the intake)

Day #2 - Evening

- ▶ The Water System has been taking periodic turbidity samples
- ▶ During the late afternoon, the turbidity at the intake had fallen to 76 NTU. The plant was started up to pump-to-waste for a short time.
- ▶ After no issues, the plant began pumping into the system again. Sedimentation Basin turbidity was <1NTU.
- ▶ The turbidity in the Buttahatchee continued to fall. The system experienced a rain event shortly after, but the turbidity never exceeded 200 NTUs.
- ▶ Overall, a total of 500-1000 people went without system pressure. Although a contingency plan was made, the hospital was never without adequate service.

The Aftermath

- ▶ A full round of bacteriological sampling was performed to check the distribution system. No positive samples were found.
- ▶ Bottled water was continued to be distributed, excess was given to schools and other organizations.
- ▶ No injuries or water borne illnesses reported!

“This was the best response to a crisis I have ever seen. The City of Hamilton received outstanding assistance from multiple state and local organizations. The community came together to help their neighbors in a way that I will never forget and always appreciate.” - Bob Page, Mayor

Follow-Ups and Lessons Learned

- ▶ A strong Emergency Response Plan can streamline the communications sent to multiple organizations. Contact information as well as established relationships are invaluable during a crisis.
- ▶ “Proper” operations of a Water System are NOT able to prevent all unwanted situations. Sometimes the problem finds you.
- ▶ Many different organizations may be involved. Use the resources that each can bring but be careful of “Too many cooks in the kitchen.”
- ▶ Redundancy - Things break, have alternative sources if feasible
- ▶ Redundancy - Stuff happens, have a back-up plan