PUBLIC WATER SUPPLIES

CHIP ZIMMER

KENTUCKY DIVISION OF WATER

MIDWEST DEWS REGIONAL PARTNER MEETING

NOVEMBER 20, 2019

KENTUCKY PLANT BOARD

- Withdrawals water from the Kentucky River
- Sells water to 8 other PWSs (3 do not have a connection with another PWS)
- Population served is approximately 52,000 (plus wholesale ~83,000)
- Conventional treatment process

EXTREME WET CONDITIONS

- Challenging but easily treated
- Increased turbidity (solids) in river
- Increased treatment chemical usage
- Increased sludge production
- Scheduled maintenance/operations/water quality projects must often be postponed
- WTP production normal or slightly below normal

EXTREME DRY CONDITIONS

- More challenging than wet weather/high turbidity conditions
  - Significant increase in chemical usage and cost
  - Difficult to maintain a distribution system chlorine residual
- Low flow and high air temperatures challenge treatment and production
  - Treatment issues include taste-and-odor compounds, increased manganese, increased hardness/alkalinity levels
  - Increase in WTP production, longer shift hours
  - Support a neighboring PWS when their source supply is low or inadequate to meet their system demand.

EXTREME DRY CONDITIONS (CONTINUED)

- Aesthetic issues with water, primarily tastes and odors if treatment is not adjusted to remove these compounds; significant increase in customer calls/social media posts.
- If dry conditions occur in late summer/early fall, there are US Army Corps of Engineer released that begin in September/October to bring lakes down to winter pool.
- If dry conditions occur in winter, options are almost non-existent for USACE releases if their lakes are already at winter pool; couple that with very cold temperatures and WTP production increases, compounding the low flow situation.

MANAGEMENT DECISIONS

- At WTP focus is on balancing regulatory compliance with aesthetics perceived by the public.
- Upper management at PWS balancing WTP and distribution system operations, public outcry and political pressures.
- Decisions, if environmental and water quality conditions are severe enough, may involve infrastructure improvements, additional sources of supply, advanced treatment or changes in distribution hydraulics/treatment/storage.

RECENT EXAMPLE

- Above normal rainfall for the area through June; July and August saw rainfall but below normal levels.
- September was the 2nd hottest on record and 2nd driest for (Frankfort); driest on record for KY
  - Flows in the Kentucky River in Pool 4 (Frankfort) were below 100 cfs to 125 cfs for most of September.
    - In September the water level over the plant raw water intake was measured to assure adequate levels for pump operation.
  - Source issues included very low turbidity (solids) levels, detectable levels of taste-and-odor compounds (geosmin and MIB), elevated manganese.
    - Did not see elevated pH (8.0 and higher)
  - Chemical costs were double the monthly budget amounts; increased power costs for additional chemical feed processes.
    - Both chemical and power costs compounded by increased production to supplement the neighboring PWS with source of supply constraints.
- River flow and water quality improved somewhat with sporadic, heavy local rain in October increased flow and reduced/eliminated the taste-and odor issues.
- As of mid-November, KY River flow in this pool is normal to slightly below normal, with dry conditions predicted over the next 2 weeks; cold air temperatures has resulted in cooler water temperatures, also helping with taste-and-odors.

WHAT CAN THE MIDWEST DEWS DO TO HELP REDUCE IMPACT FROM TRANSITIONS

- Good, reliable river flow data is critical.
- Communication with in-state regulatory agencies and federal oversight agencies (state environmental agencies and federal USACE).
- Development of a means of relevant communication directly to affected PWS's could do by state, by watershed, by region?
- Assistance with developing in-state or watershed affected groups (in this case, PWSs); for example, a lower KY River watershed group for quickly sharing information, data, treatment options, successes/failures, public education, etc. (I found myself making numerous phone calls over many days getting this info).
- Development of generic talking points for dealing with the public and politicians.