Presentation to Lead Working Group Kentucky LCR Compliance History

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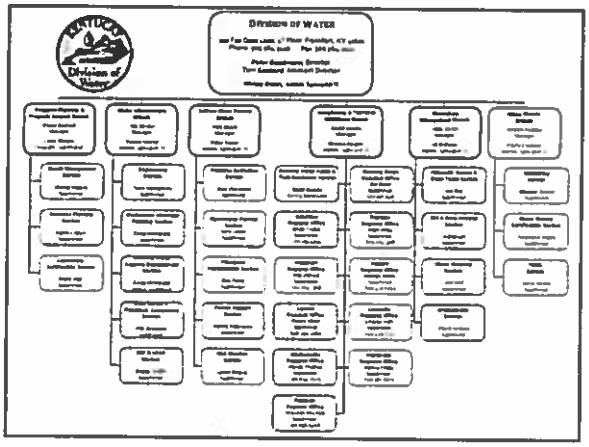


DOW Organization and Personnel Issues

- 5/6 managers have less than 2 years
- Many new staff; over 42 new employees in 2015
- Institutional knowledge challenges; especially in drinking water!
- Reorganization proposed; re-establishes a Drinking Water Branch
- Moving to new building in June

Secretary Snavely's View

- Ensure that we are implementing the statutes, regulations and programs so that we are protecting human health and the environment
- Work in a business friendly manner
- Work collaboratively with those that we regulate and with stakeholders

Major Kentucky Water Challenges

1. Regulations and Water Quality - compliance with water, wastewater and stormwater regulations to improve water quality
   - Drinking Water – Disinfection By Products, Agal Toxins, Emerging Contaminants, Lead
2. Aging Infrastructure – renewing water infrastructure and upgrades to comply with regulations
   - Proactive Capital Investments
3. Water Rates and Affordability
4. Workforce – workforce availability, talent development and succession planning

Drinking Water System Info

- 445 Public Water Systems
- Serve more than 95% of Kentuckians
- Small systems state: more than half of PWSs serve <3300
- 138* Surface Water Systems
  - 177 surface water intakes
- 113* Groundwater Systems
  - 236 groundwater sources: 16 mines/springs; 220 wells
- 194 Systems (consecutive) that do not produce water, but only purchase water from other PWSs
- 415 systems are interconnected (93%)
  - N.B. Many systems that produce water also purchase water from other systems.

*5 Systems that have both groundwater and surface water sources

Drinking Water Infrastructure Info

- 213 drinking water treatment plants (average age is 36 years)
- 1842 storage tanks (average age is 26 years)
- 58,783 miles of water lines (average age is 38 years)
- 11,607 miles older than 50 years (16%)
- Estimated drinking water infrastructure improvement needs through 2025 is $1.9 billion
- Average monthly drinking water bill is $_____
  - Avg fee for 4,000 gallons (Non-Municipal) = $32.24
  - Avg fee for 4,000 gallons (Municipal Inside) = $26.70
  - Avg fee for 4,000 gallons (Municipal Outside) = $33.41

Resilience & Sustainability

- Goal: resilient and sustainable communities requires sustainable and resilient systems (e.g. water utilities and infrastructure)

Sustainability

- The ability to continue to operate indefinitely in a functional, fiscally sound manner and sustain compliance.
  - Infrastructure & Asset Management
  - Personnel & Management
  - Operations
  - Compliance
- Triple bottom line
  - Social
  - Economic
  - Environmental
- Difficult to disentangle the interdependent variables

Sustainability

- Societal, Environmental and Economic sustainable uses are interrelated
  - Infrastructure
  - System Redundancy
  - Community Resilience

Resilience

- Capacity of systems to survive, adapt and grow in the face of stresses, upsets and disasters
- Systems must transform when required
- Humans, organizations, systems and societies are not inherently resilient
  - Plan
  - Learn
  - Adapt
  - Improve

Resilience and sustainability of Kentucky's water systems

- Many systems are experiencing little or no growth, and numerous systems are experiencing declining growth.
- The costs for small systems to sustain infrastructure and operate in compliance with federal rules is in some cases an unsustainable economic burden.
- Medium and large systems are also challenged by low growth and the "conservation conundrum."
- Many utilities historically assumed 20 years of linear growth in customer base to fund major infrastructure projects.

Resilience and sustainability of Kentucky's water systems

- Now: little/no growth in customer base and declining per capita consumption.
- Spreading more infrastructure costs over fewer gallons of water sold. Therefore, many utilities are in a cash-flow bind, and thus are forced to borrow more and increase rates.
- Water is a high fixed-cost business, and public expectations as well as regulations require utilities to stay ahead of the capacity curve (generally 15-20% excess for growth, emergency and peak demand).
- As demands decline, many utilities have reserve capacities that exceed 25%, however the customer rate base must fund the operation and maintenance, capital, depreciation, and debt service of this overbuilt infrastructure.

Resilience and sustainability of Kentucky's water systems

- Utilities have essentially been backed off the optimal point on the efficiency curve
- The marginal cost to produce or treat the next gallon of water is very low, but the cost to continue to de-marginalize will be very high for the consumer because utilities are de-leveraging their built infrastructure.
- Anticipate 6-10% annual utility rate increases over the next decade until this phenomena corrects itself (~20 years?)
- With inflation annual rate increases of 12-20% could be anticipated.

Resilience and sustainability of Kentucky's water systems

- Some communities are actually experiencing price elasticity in water and wastewater; as customers are changing their behavior due to high water and sewer bills.
- Commercial customers are recycling more of their water, using on-site treatment and more efficient processing of water and wastewater.
- Residential customers are also changing their consumption behavior and replacing dishwashers, washers, toilets and fixtures with lower use and higher efficiency devices.
- The reward for using less water is higher water rates, and the burden is disproportionally higher on low-income families, as they can least afford new low-flow plumbing renovations, high-efficiency washing machines, or the ability to fix leaking pipes.

Capacity Development

- Working with public water utilities to ensure that they have or are developing:
  - Financial Capacity
  - Managerial Capacity
  - Technical Capacity
- Goal: Resilient & Sustainable water systems

Lead in Drinking Water

- What's the status for Kentucky's Public Water Systems?

Health Impacts of Lead

- Lead is a significant public health challenge
- Domestic sources of lead include paint chips, lead tainted dust from paint, hobbies such as bullet and fishing sinker making, drinking water from corrosion of lead from lead seals, lead service lines, solders and lead in fixtures
- Kentucky Department of Public Health has never identified a lead poisoning issue in Kentucky from drinking water

Health Impacts of Lead

- Lead can affect almost every organ and system in your body. Children six years old and younger are most susceptible to the effects of lead.
  - Even low levels of lead in the blood of children can result in:
    - Behavior and Learning Problems
    - Lower IQ and Hyperactivity
    - Slowed Growth
    - Hearing Problems
    - Anemia

Health Impacts of Lead

- **Pregnant Women**
- Lead can accumulate in our bodies over time, where it is stored in bones along with calcium. During pregnancy, lead is released from bones as maternal calcium and is used to help form the bones of the fetus. This is particularly true if a woman does not have enough dietary calcium. Lead can also cross the placental barrier exposing the fetus the lead. This can result in serious effects to the mother and her developing fetus, including:
  - Reduced growth of the fetus
  - Premature birth

Health Impacts of Lead

- **Other Adults**
- Lead is also harmful to other adults. Adults exposed to lead can suffer from:
  - Cardiovascular effects, increased blood pressure and incidence of hypertension
  - Decreased kidney function
  - Reproductive problems (in both men and women)

Lead in Drinking Water

- Lead in Drinking Water has been a big issue in the news because of Flint MI; Sebring OH, Jackson MS
  - Lead in drinking water not been a significant issue in Kentucky
- Lead occurs in drinking water from corrosion of lead from lead seals, lead service lines, solders and lead in fixtures
- Public Water Systems conduct control corrosion measures to ensure that the produced water is not corrosive to Pb and Cu in the distribution system

1991 Lead and Copper Rule

- Lead and copper enter drinking water primarily through plumbing materials. Exposure to lead and copper may cause health problems ranging from stomach distress to brain damage.
- In 1991, EPA published a regulation to control lead and copper in drinking water. This regulation is known as the Lead and Copper Rule (LCR). Since 1991 the LCR has undergone various revisions.

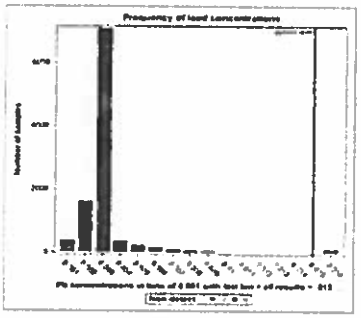
Lead and Copper Rule

- The treatment technique for the LCR requires systems to monitor drinking water at customer taps. If lead concentrations exceed an action level of 15 parts per billion in more than 10% of customer taps sampled, the system must undertake a number of additional actions to control corrosion.
- If the action level for lead is exceeded, the system must also inform through public education about steps they should take to protect their health and the water system may have to replace lead service lines under their control.

Lead Compliance Data

- Following the Flint disaster, DOW began to look at the compliance data for the Lead & Copper Rule (LCR)
- Over the past nine years:
- 409 Kentucky PWSs were subject to the federal LCR
- 10,380 water samples collected at households and businesses were analyzed for lead
- More than 77% of these samples had no detection of lead
- Approximately 1% of these samples exceeded the action level of 15 parts per billion established by EPA in the LCR

Lead Compliance Data



Lead Compliance Data

- LCR requires PWSs sample a number of households in their distribution system, based on population.
- Sampling focuses monitoring on those households most vulnerable to lead and copper contamination, such as single-family homes (installed after 1982) that contain copper pipes with lead solder, contain lead pipes or are served by a lead service line: Tier 1
  - Tier 1 does not include schools or daycares

Lead Compliance Data

- Tier 2 sample sites consist of buildings, including multi-family residences that contain copper pipes with lead solder, contain lead pipes or are served by a lead service line (installed after 1982). Possibility of schools or day cares being in the sample pool
- Tier 3 sample sites consisting of single family structures that contain lead solder (installed before 1983)

Lead Compliance Data

- The action level is exceeded when >10% of the PWS's samples >15 ppb threshold
- Exceedance of an action level determines whether systems need to undertake additional monitoring and treatment technique requirements
- Initial sampling conducted over two consecutive six-month periods. If no action levels have been exceeded, sampling is reduced to annual sampling for two consecutive years, and then every three years if no issues are identified

Lead Compliance Data

- 8 PWSs over the past 10 years have exceeded LCR action levels /ALEs
- Division of Water has required those 8 PWSs to:
  - Notify the public via newspaper and other media
  - Conduct sampling of their source water
  - Conduct additional and broader water quality monitoring at the treatment plant and in the distribution system, including restarting lead monitoring, and
  - Formulate a plan and take action to reduce lead levels.
- 3 PWSs exceeded the action level for lead at a frequency requiring action; all these PWSs have returned to compliance with LCR

Lead Working Group

- Following the Flint disaster, we began to discuss the issue of lead in drinking water with a number of folks in the industry, including Mr. Lovan and Mr. Heitzman, and with EPA leadership
- We had specific concerns regarding DOW's review of new source waters and treatment, but also regarding corrosion control compatibility with system-to-system interconnections and the impact of chemical treatment changes on corrosion control and whether our knowledge review were adequate
- All of us, DOW and the industry do not want a situation to develop in Kentucky similar to Flint or elsewhere
- Kentucky has a good track record regarding the LCR

Lead Working Group

- Other concerns
  - What are the protocols being used by PWSs
  - What various public water systems were doing in response to identified Pb issues
  - Communication about lead and public health risk
  - Are the PWS's and DOW's review and communication protocols adequate to address an identified issue in a timely manner
- Determined early in the year to convene a stakeholder workgroup to look at these and other related issues, consistent with the DOW's collaborative approach with the drinking water industry

Questions?

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