Drinking Water Laws and Regulations

Public Service Commission Personnel Training

Division of Water

Department for Environmental Protection

To Protect and Enhance Kentucky's Environment

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Drinking Water Regulations

- Federal level
- State level
- Related laws and regulations

Federal Safe Drinking Water Act

- United States Environmental Protection Agency is the federal agency responsible for protecting the United States' drinking water
  - Since 1990, EPA has passed 19 drinking water regulations
  - Currently regulates 90 contaminants
  - Requires compliance with contaminant levels, monitoring, reporting and notification

Federal Safe Drinking Water Act--Goal

- Primary goal of the Safe Drinking Water Act is to protect human health by regulating the treatment and distribution of drinking water
  - Compliance with maximum limits for contaminants
  - Monitoring and reporting requirements
  - Public notification and awareness requirements
  - Technical/managerial/financial aspects
  - Operator certification

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Federal Safe Drinking Water Act

- Every 6 years the EPA reviews the existing regulations to see if changes are needed
  - Example: Revised Total Coliform Rule will replace the original 1989 Rule
- EPA maintains the "Contaminant Candidate List" (CCL) of potential drinking water contaminants
- EPA also directly administers "Unregulated Contaminant Monitoring Rules" to determine the extent of selected contaminants
  - Water systems have monitored for UCMR 1 and 2
  - UCMR 3 is pending

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Kentucky Drinking Water Regulations

- Kentucky's Division of Water administers and enforces the Safe Drinking Water Act
  - EPA develops a new drinking water regulation
  - KY then adopts the federal regulation
    - The KY regulation must be presented at a public meeting and must be approved by 2 legislative committees
  - EPA approves KY's regulation and program (this is known as "primacy")

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Kentucky Drinking Water Regulations

- KY has Statutes (laws) that give the state the authority to regulate drinking water systems
  - KRS 151, 223 and 224
- Regulations are then developed to implement these laws
  - 401 KAR Chapter 8: Public Water Supply
  - 401 KAR Chapter 11: Operator Certification

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Drinking Water Compliance Terms

- Turbidity: Clarity of the water
- MOR: Monthly Operating Report that includes turbidity and disinfection information
- “Bacts” Coliform samples
- Chlorine residual: Amount of chlorine detected in the plant or distribution system to control disease-causing organisms
- “Chems” Chemical contaminants

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Drinking Water Compliance Terms

- DBPs: Disinfection by-products (primarily THMs and HAAs) formed when chlorine reacts with organic matter
- THMs: Trihalomethanes
- HAAs: Haloacetic acids
- PN: Public notification
- NOV: Notice of violation
- LOW: Letter of warning
- M&R: Monitoring and Reporting

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Drinking Water Compliance Terms

- CCR: Consumer Confidence Report
- BWA: Boil Water Advisory (issued for potential or confirmed microbiological contamination)
- Sanitary Survey: Comprehensive inspection of the entire water system covering 8 areas
- Capacity:
  1. Approved rated flow
  2. Technical, managerial and financial ability to meet the SDWA
- AWOP Area-Wide Optimization Program

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Drinking Water Compliance Terms

- Infrastructure: The tangible "concrete and steel" parts of the system
- Sustainable Infrastructure: Maintaining/improving drinking water "concrete and steel"

Defining a Water System

- Public Water System
  - Over 15 connections or over 25 people served
- Community Water System
  - Over 15 connections or over 25 people served for at least 6 months a year
- Non-community Water System
  - Non-transient: same people for 6 months
  - Transient: variable population
- Semi-public Water System
  - Less than 15 connections or less than 25 people served
- Bottled Water System

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Water System "Capacity"

- A public water system should demonstrate "capacity" to meet the SDWA requirements
  - Technical
  - Managerial
  - Financial
- TMF capacity is inter-related
  - Without finances a plant cannot operate
  - Without sound management, finances cannot be obtained and system operation cannot be maintained
  - Without technical ability, safe water cannot be provided to expand the system to provide additional customers and income

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Water System "Capacity"

- Capacity Development Assessment
  - Key components needed to successfully obtain and maintain TMF capacity
  - This assessment is incorporated into the Sanitary Survey process
- Managerial and financial areas are difficult to measure but critical to water system operation
  - Planning (asset management, contingency)
  - Decision making
  - Organizational structure
  - Budgets (operational, capital, short/long term)
  - Rates
  - Water loss

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Source Water Quality and Quantity

- Raw source water must meet "Drinking Water Standards" set by KY regulations
  - These are set at the finished drinking water limits established by the Safe Drinking Water Act
  - Raw water quality also regulated by the Clean Water Act through "designated uses"
    - In KY the classification is "Domestic Water Supply"
- 263 Water Treatment Plants (55.4% of the public water systems)
  - 163 surface water treatment plants
  - 106 groundwater treatment plants

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Source Water Quality and Quantity

- 401 KAR 4:010 “Water Withdrawal”
  - Any withdrawal from rivers, impoundments or wells above 10,000 gallons per day must have a withdrawal permit
- Source water and Wellhead Protection Plans
  - Identify contaminants in the area around the source and solutions to controlling those contaminants.
- Water Shortage Plans
  - Tend to focus on droughts
  - Should be expanded to all types of water shortages (power outages, tank failures, plant upsets, pandemics, etc)

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Drinking Water Regulations

- Over 19 different drinking water “rules” in 401 KAR Chapter 8:
  - Coliforms (bacteriological)
  - Inorganics
  - Lead and copper
  - Volatile organics
  - Synthetic organics
  - Radionuclides
  - Turbidity (surface water treatment)
  - Disinfection by-products
  - Disinfection residuals
  - Cryptosporidium, Giardia & viruses
  - Reports and notifications

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Drinking Water Regulations

- There are 90 regulated contaminants
  - 6 microbiological
  - 1 turbidity
  - 3 disinfectants
  - 4 disinfectant by-products
  - 1 disinfection by-product precursor
  - 16 inorganics (metals and nutrients)
  - 53 volatile and synthetic organics
  - 4 radiological
  - 2 lead and copper

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KY Drinking Water Reports and Data

- All drinking water data must be analyzed in labs certified by KY or EPA
  - The KY Division of Water audits and certifies all in-state drinking water labs
    - In KY there are
      - 44 certified microbiological laboratories and
      - 18 certified chemistry laboratories
    - There are 44 certified chemistry and radiological labs located in other states
  - 2 full-time staff are involved with lab certification
    - Microbiological, chemical, Crypto and radiological

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Drinking Water Compliance

- Compliance is based on
  - Maximum contaminant levels (MCL)
    - Most contaminants
  - Treatment techniques (TT)
    - Difficult-to-measure contaminants that are easily controlled by treatment (turbidity, Crypto, Giardia, viruses)
  - Action levels (AL)
    - For lead and copper

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Finished Drinking Water Quality

- Monitoring and Reporting
  - Monitoring can occur as frequently as every 4 hours or as long as every 3 years
    - Acute contaminants are monitored more frequently such as microbiological and turbidity
    - Chronic contaminants or those not often detected are monitored less frequently such as organic contaminants and radiologicals
  - Monitoring occurs in the water treatment plant and in the distribution system
  - Compliance data reports are submitted at least on a monthly basis

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KY Drinking Water Reports and Data

- Data is reported in different ways
  - Milligrams per liter (mg/L) is the same as parts per million (ppm)
    - 1 in a million (1,000,000)
  - Sometimes it is reported in micrograms per liter (ug/L)
    - 1 in a billion (1,000,000,000)
  - Other units such as
    - NTU = Nephlometric Turbidity Units
    - SU = Standard Units (pH)
    - piCu/L = Picocuries per liter (radionuclide)
- State developed report forms for all contaminants

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KY Drinking Water Reports and Data

- KY has 475 public water systems
  - Over 6000 microbiological results are submitted to the Division of Water each month
  - Approximately 20,000 turbidity results are submitted each month
  - 475 Monthly Operating Reports that vary from 4 to 20 pages in length are received each month
  - On an annual basis, over 1million analytical results are submitted for compliance
- 7 staff are involved with compliance data

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Drinking Water Technical Assistance

- Compliance with the SDWA regulations is challenging—period
  - DOW has 6 staff state-wide that provide technical assistance to help systems stay in compliance
    - One-on-one assistance to systems
    - Small group training
    - Presentations to large audiences
  - Coordinate the nationally-recognized Area-Wide Optimization Program (AWOP) that encourages systems to improve treatment to produce even safer water

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Drinking Water Evaluations

- SDWA now requires all water systems to undergo a "sanitary survey" every 3 years that covers 8 areas from source water to management to recordkeeping to treatment to distribution
  - Jointly conducted by DOW Capacity Development section and the Compliance/Technical Assistance Branch (primarily the Regional Office staff)
  - Approximately 120-130 per year
- Also the DOW Regional Offices conduct inspections annually for all water systems not scheduled for a sanitary survey
  - Not as comprehensive as a sanitary survey

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KY Drinking Water Reports and Data

- SDWIS = Safe Drinking Water Information System
  - State database for tracking and running compliance
  - Now at version 3.0
  - Compatible with Federal database
  - KY developed data entry files to help with entering the data into SDWIS
- SDWIS will no longer be supported by EPA in several years
  - Moving through EPA Region-type support then to a "cloud" environment

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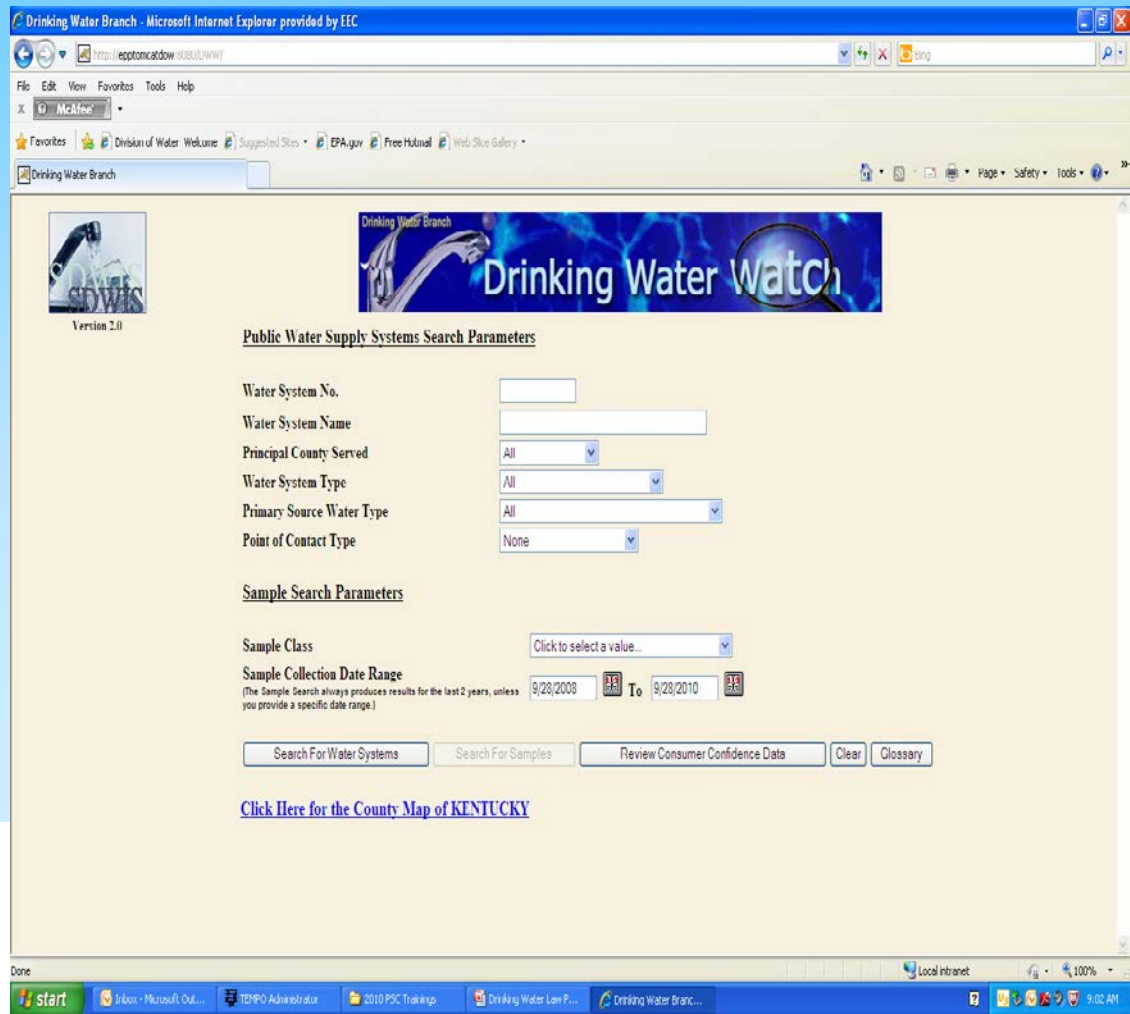
Drinking Water Watch

- Public access to SDWIS
  - http://dep.gateway.ky.gov/DWW



DW Enforcement Response Policy (ERP)

- New EPA initiative to track chronic non-compliance
- Replaces the old Significant Non-compliance (SNC) list
- Combination of points assigned to acute and chronic violations as well as monitoring and reporting violations
  - Certain score requires “formal” enforcement
  - In KY this means an Agreed Order

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Consumer Notification

- The public must be notified of
  - Safe Drinking Water Act violations
  - Potential health issues such as lead
- Through the Consumer Confidence Report (CCR), water system customers receive an annual report that provides information on the water system, including violations, detected contaminants and health effects
- Other notices include Boil Water Advisories

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Operator Staffing and Certification

- Water treatment plants and distribution systems must be staffed by properly certified personnel in direct responsible charge (401 KAR 8:030)
  - Plant classification and staffing based on source water and rated design capacity
    - Surface waters require the most attention due to its variability and each shift must be staffed
  - Distribution is based on population served
- Alternate staffing plans

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Operator Staffing and Certification

- Division of Compliance Assistance
  - 401 KAR Chapter 11
- Combination of education and experience
- Operator-in-training concept
- Certified operators must obtain Continuing Education Units (CEUs) to maintain a license
  - Every 2 years
  - Amount of CEUs required based on classification level
- Ethics language in regulation

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Engineering Plans Review

- States must have a process for assuring water treatment plants and distribution systems are designed per current engineering standards
  - 401 KAR 8:100
  - Kentucky Design Criteria
  - 10 States Standards
- Overlap with Department for Public Health and Division of Plumbing on determining “potable” water needs
  - Food establishments
  - Restrooms with sinks

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Related Drinking Water Regulations

- Any discharges back to receiving streams or lakes (Clean Water Act permit)
  - Water treatment plant discharges (KPDES KYG64)
- Construction in a floodplain, dredging a stream or impacting water quality standards
  - 401 and 404 permits (Corps of Engineers and DOW)
- Disposal of any solid material removed during treatment (such as filtration)
  - Special Waste disposal permit (Division of Waste Management)

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Related Drinking Water Regulations

- Air quality (Clean Air Act)
  - Potential chlorine gas releases
- Occupational health and safety of workers (OSHA)
  - Includes chlorine gas safety, confined space entry, lockout/tag out, Process Safety Management, respiratory protection
- Emergency preparedness

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Questions?? Comments??

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