



Introduction to the Area-Wide Optimization Program (AWOP)

Focus On Change
2019



Overview

- **What is optimization?**
- **Area Wide Optimization Program (AWOP)**
- **Success story**
- **The goals of AWOP**
- **The advantages of AWOP**



What is Optimization?

- **Optimization is the action of making the best or most effective use of a situation or resources.**
- **The process of taking an existing design and evaluating improvements to make a more effective system.**
- **An alternative action with the most cost effective or highest achievable performance under the given limits**



What is Optimization through AWOP?

- **Area-Wide Optimization Program (AWOP) defines optimization as providing public health protection for drinking water systems by using a proactive approach.**
- **Operators who continually monitor chemical dosages, balanced with the changes in water quality, and who ensure all processes are functioning properly will produce quality water.**
- **AWOP is designed to assist water systems to work towards optimizing their existing treatment processes in an effort to increase public health protection.**



What is Optimization through AWOP? (2)

- **An optimization program encourages drinking water quality beyond compliance levels, to increase public health protection through:**
 - **Enhanced process monitoring and control**
 - **Using existing staff and facilities**
 - **Measuring performance relative to optimization goals**
 - **Technical tools and implementation approaches focused on improving and/or maintaining water quality – using the multiple barrier approach**



AWOP

- **1988 – Comprehensive Correction Program (CCP) framework developed for wastewater treatment plant compliance issues.**
- **1989 – CCP framework used for optimizing drinking water plant performance through Microbial (Turbidity) Optimization**
- **Program has expanded to other areas, including the distribution system for free chlorine and chloramine systems**

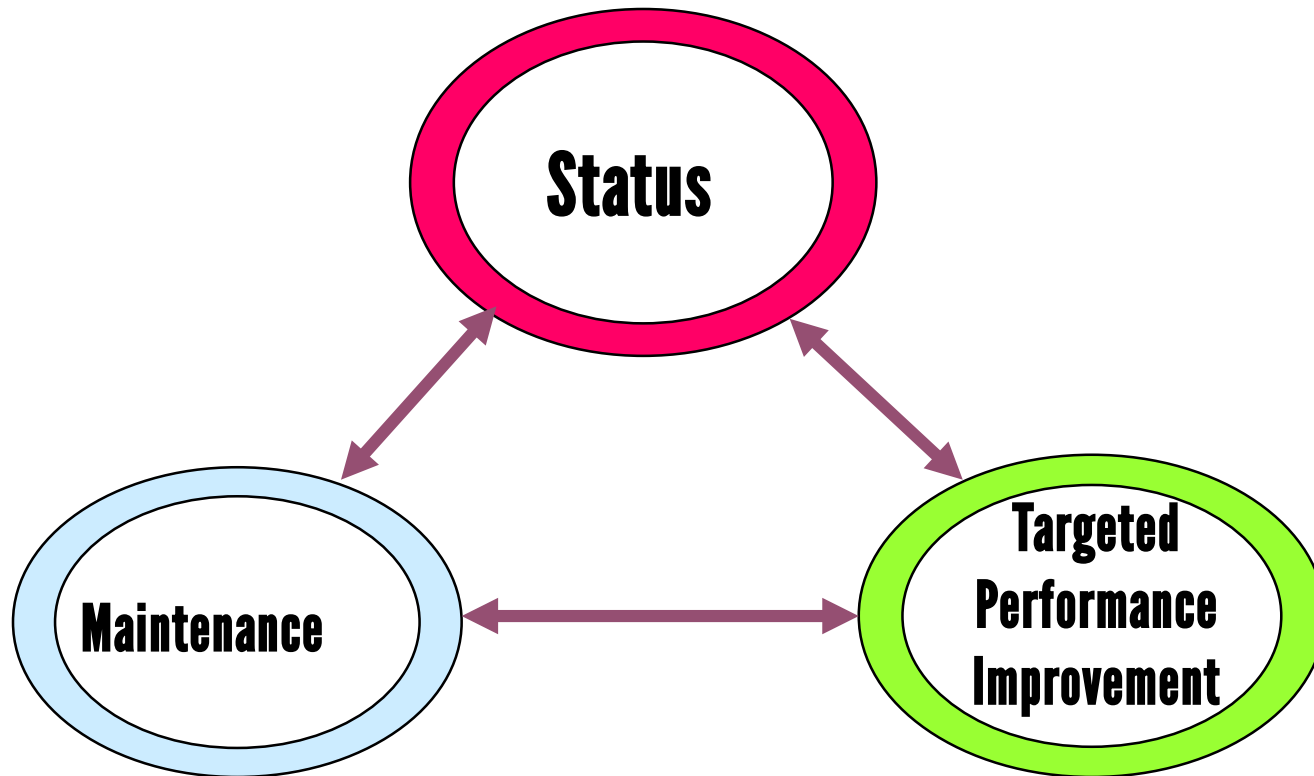


Why Implement AWOP?

- **Implementation allows for optimization of the day to day operation of water systems to enhance the Drinking Water Program to prevent health based issues.**
- **To enhance Drinking Water Program through –**
 - **Sanitary Surveys**
 - **Operator training**
 - **Compliance/Enforcement**
 - **Technical Assistance**
 - **Cost Effectiveness**
- **These enhancements will help the drinking water system adopt its own optimization goals**



What is Optimization Through AWOP?



AWOP Components



Treatment and Distribution System Considerations

Optimization tools can identify the source of water quality issues:

- **water treatment**
- **distribution system operations**

Work can be directed to improve water quality:

- **In-plant optimization approaches focus on TOC removal and optimizing disinfection – to minimize in-plant DBP formation and/or maximize disinfectant stability**
- **Distribution system optimization approaches focus on minimizing water quality degradation in the distribution system**



Treatment and Distribution System Considerations (2)

- Provides the operators with the knowledge and tools to achieve improvements to the treatment and distribution system.
- The same tools can be used to achieve return to compliance
- AWOP improvements benefit other Florida programs
- Impact individual plant performance
- Impact plant performance statewide



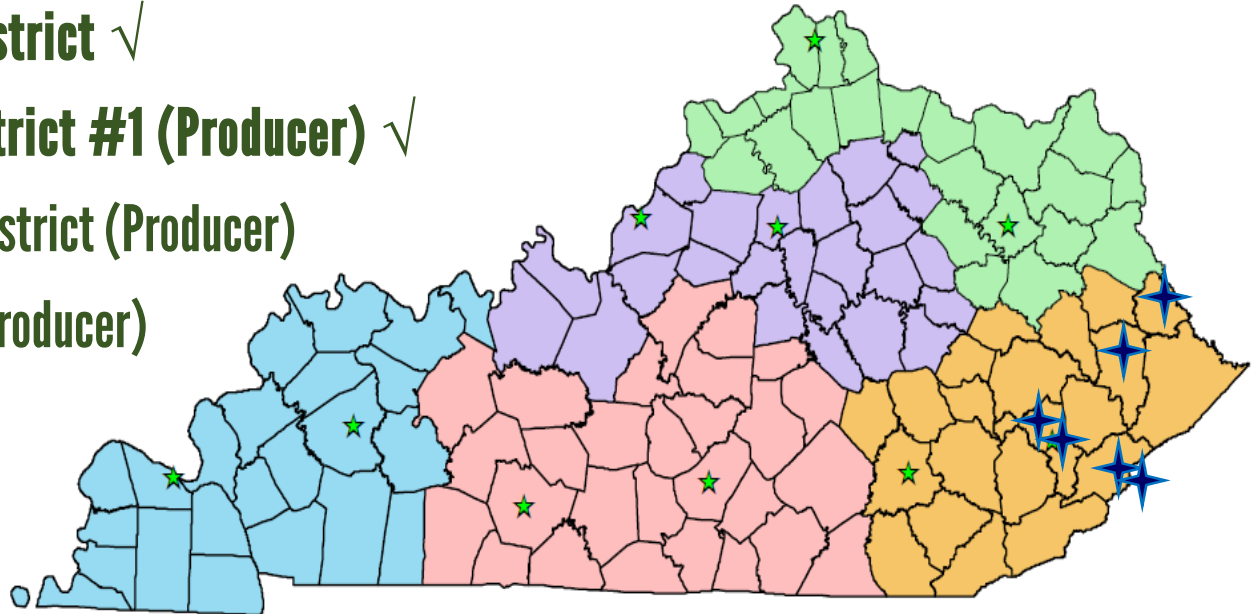
Evaluation

- **Distribution System Influent Study: determine water quality entering the system**
- **Chlorine/Ammonia Dosing Evaluation**
- **Optimization monitoring in the distribution system**
- **Corrective strategies to minimize water age and improve water quality include:**
 - **Tank Operations**
 - **Strategic Flushing**
 - **Rerouting Water**
- **Parameters differ for free chlorine and chloramine systems, but the overall approach is very similar**



Kentucky Success Story

- **Hazard Water Department (Producer)** ✓
- **Jenkins Water System** ✓
- **Letcher County Water District** ✓
- **Martin County Water District #1 (Producer)** ✓
- **Southern Water & Sewer District (Producer)**
- **Mountain Water District (Producer)**



Bold—Selected Based on Out-of-Compliance Status in 2016

✓—In Compliance, 3rd Quarter 2018





Kentucky Targeted Technical Assistance

Primary focus—reducing TOC and DBP formation potential at the water treatment plant, particularly those that sell to purchasing systems out of compliance

- **Special studies (i.e., jar testing) to optimize the following:**
 - **Pre-oxidation (potassium/sodium permanganate, hydrogen peroxide, chlorine dioxide)**
 - **Coagulation (dosage), sedimentation, & filtration**
 - **Chlorination (point of use & dosage)**
 - **Powdered activated carbon (point of use & dosage)**



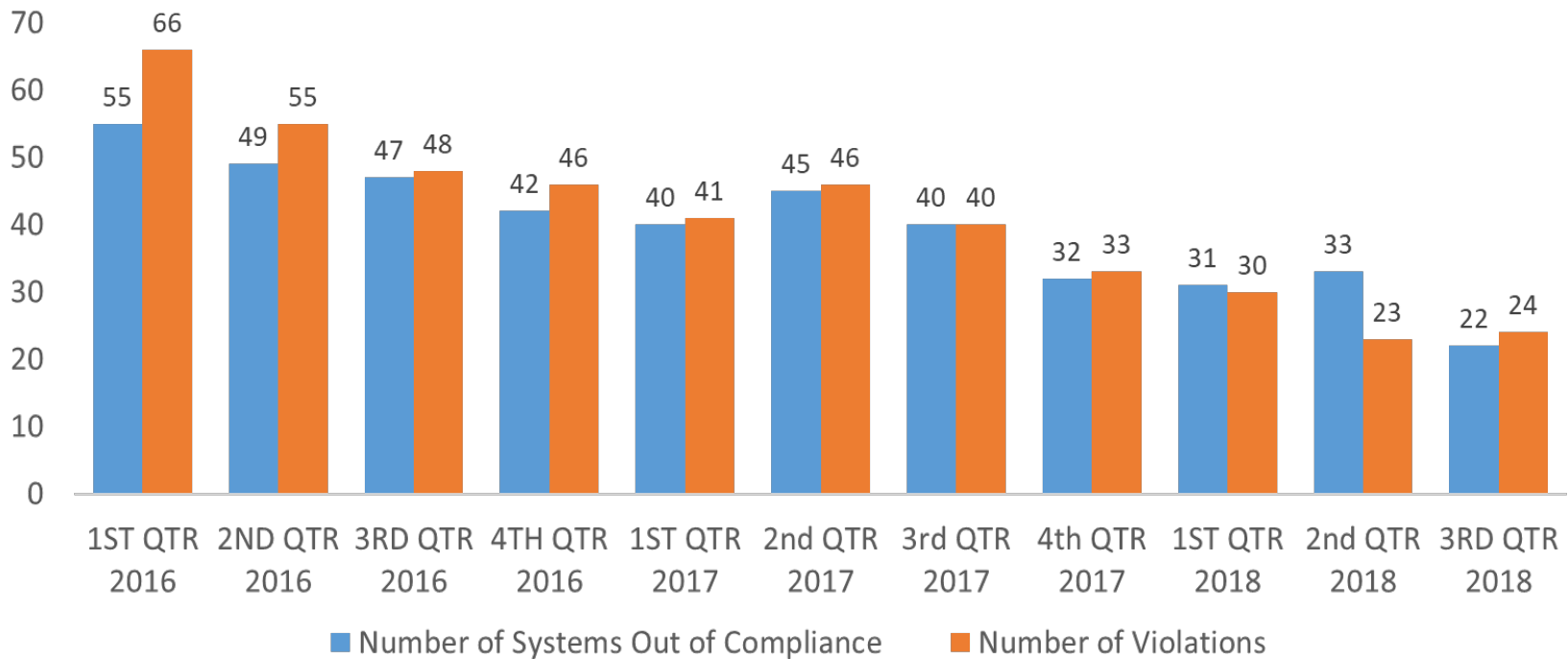
Kentucky Targeted Technical Assistance (2)

(DBP)

- **12 systems completed from 2010 to 2014**
- **6 were selected due to DBP violations**
- **Of those 6, all are currently in compliance**



Kentucky DBP MCL Violations Trend





Potential

- **Results in long-term improved performance and enhanced public health protection**
- **Enhanced staff capability and motivation**
- **State and plant staff understand role in public health protection**
- **Provides small systems tools for meeting or exceeding compliance**
- **Develops processes to more effectively implement new regulations (LT2, DBPs)**



What Are the Goals of AWOP?

- **Help determine the status of the drinking water systems' water quality and any health risks to the public**
- **Help ensure reliability of the plant's monitoring equipment and monitoring frequency to help target possible causes of the system's issues**
- **Expand existing performance protocols to increase awareness of the plant for improvements**



What Are the Advantages of AWOP?

- **The number one benefit of AWOP is improved water quality at the drinking water treatment plants.**
- **An additional benefit is that a system will better understand its role in treatment optimization as it relates to public health protection.**
 - **The systems receive tools needed to comply with drinking water regulations to prevent health based issues.**

Compliance first, optimization second



What Are the Advantages of AWOP?

- **Staff can apply new technical concepts to sustain improvements in the plant's operation.**
- **The life of the system's existing infrastructure is prolonged through optimizing performance which helps use limited resources efficiently and effectively.**
- **The efforts and lessons learned can be incorporated back into the AWOP program for other member states to try at one or more of their water systems.**



Questions?



Contact Information

Jamie Shakar

Environmental Administrator

DEP Source & Drinking Water Program

Jamie.shakar@floridadep.gov

850-245-8626

