South Carolina AWOP Annual Report for 2019

March 2020

Prepared For:

U.S. EPA Region 4 Multi-State
Area Wide Optimization Program

Prepared By:

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Maintaining the Program

South Carolina Department of Health & Environmental Control (SCDHEC's) began participating in the EPA's National Area-Wide Optimization Program (AWOP) in 1997. The goal of the drinking water optimization program is to maximize public health protection by setting and meeting stringent water treatment plant water distribution performance goals. The Area Wide Optimization program is flexible and adaptable in order to set goals in other areas of drinking water like lead and copper corrosion control, contaminants of emerging concern, and operation and maintenance techniques and procedures.

Identify & Address Institutional Challenges

During 2019, there continued to be increased public interest and regulatory agency focus on lead in drinking water. Using procedures, critical thinking, and other analysis skills developed through involvement in the AWOP, the Department initiated, and continued activities related to lead and copper in schools and childcare facilities. The Department also began developing a strategy to deal with PFAS.

The Revised Total Coliform Rule is another regulatory implementation area that requires a significant amount of time focus by technical staff. Water utilities continue to exceed the trigger levels requiring both level 1 and level 2 assessments. These completed assessments must be reviewed by technical staff to determine whether the regulatory requirements have been met.

Finally, the Department's efforts related to PFAS have been increasing. A comprehensive strategy document addressing current knowledge, sampling techniques, a survey of occurrence in out state, and a monitoring strategy was developed. Implementation of the strategy has begun in 2020.

Internal Support

Internal support for the program remains high. SCDHEC's Environmental Affairs Director, Myra Reece, participates in our AWOP awards program annually and continues to have positive comments about the program and the water systems that achieve the optimized performance goals. After helping to distribute the awards to the water systems, she made several comments complimenting staff and encouraging SCDHEC and water system staff to continue our efforts. She also had many positive comments to share with the regulated systems about the importance of clean water and thanked them for their efforts. EPA Region 4 continues to provide statements that are read to the attendees. Many water systems publish their own media stories and share pictures of their receipt of the award. Most water plants proudly display the award and poster.

Optimization continues to be encouraged in all water program areas. Optimization has been applied via data reviews and analysis, sampling protocol reviews, assessing potential for special studies, and sampling more than the minimum required in the regulation.

Most of the funding for South Carolina's program comes from the State Revolving Fund (SRF) program. An annual report to EPA Region 4 and tri-annual report to the Governor, compiled through the SRF program, includes a large AWOP section.

Core Team Structure & Capacity

South Carolina's Core AWOP Team Members

AWOP Team Member	Position	CPE Training Status
Doug Kinard, PE	Division Director	Complete
Richard Welch, Jr., PE	Section Manager	Complete
Lindsey Bounds	Environmental Engineer	Complete
Tracy Scott	Environmental Engineer	1 CPE's remaining
Rene Chavis	Environmental Engineer	3 CPE's remaining
Mohammad Korkzan	Environmental Engineer	2 CPE's remaining
Fred Taylor*	Environmental Scientist	Complete
Debra Boston*	Environmental Scientist	3 CPE's remaining
Brittany Seo	Environmental Engineer	3 CPE's remaining
Kevin King	Environmental Engineer	3 CPE's remaining

*Certified water treatment and/or wastewater plant operator.

Water System Status

Microbial Ranking Criteria & Optimization

The SCDHEC AWOP team has developed a priority ranking system to facilitate surface water systems prioritization with respect to public health risk potential. This system has been very successful and has been reevaluated several times since its development. The prioritization allows the team to apply resources and optimization tools where the need is greatest. The scoring worksheet used to evaluate each plant considers a 2-year regulatory compliance (MCL, treatment technique), sanitary survey results from a 2-year period, and operational data (turbidity measurements) taken over a 1-year period. Using this worksheet has allowed the team to focus on those systems that have the greatest need for optimized performance.

Microbial Ranking Criteria Worksheet

2-year regulatory compliance	Points (Per #)	Results of last 2 Sanitary Surveys	Points (Per #)
# Acute MCL violations	40	# Overall unsatisfactory surveys	40
# MCL violations	20	# Overall needs improvement surveys	20
# Treatment technique violations	20	# Individual items unsatisfactory	10
		# Individual items need improvement	5

Operational Data based on 1-year					
Filtered Turbidity		Settled Turbidity		Raw Turbidity	
# days > 1 NTU	20	# days > 10 NTU	5	# days > 250 NTU	5
# days > 0.5 NTU	10	# days > 5 NTU	2	# days > 100 NTU	2
# days > 0.3 NTU	2	# days > 2 NTU	0.5	# days > 50 NTU	1
# days > 0.1 NTU	1			# days > 25 NTU	0.5

Is plant operated 24/hr day?	No = 20 points
Does plant have more than one clearwell?	No = 20 points

Prioritized List of Plants

The table below shows the current list of the worst performing plants and performance numbers for 2019. In addition, the table shows the corresponding water system ranking in 2018.

Microbial Status Component

2019 Rank	PWS	Status Notes	Ongoing or Planned Action	2018 Rank
1	Pickens	95th% Settled = 2.10 NTU 95th% Filtered = 0.19 NTU 165 days filtered > 0.1 NTU	Technical Assistance	9
2	Batesburg-Leesville	95th% Settled = 3.32 NTU 95th% Filtered = 0.13 NTU Sanitary Survey issues; consistent high settled water	New source / capacity reduction	4
3	Saluda County	95th% Settled = 0.72 NTU 95th% Filtered = 0.26 NTU Filtered water issues	Technical Assistance	New Plant
4	Walhalla	95th% Settled = 3.06 NTU 95th% Filtered = 0.15 NTU	New plant & intake under construction	7
5	Florence	95th% Settled = 2.51 NTU 95th% Filtered = 0.09 NTU	Compliance/ Enforcement action; Instrument issues	1
6	Whitmire	Turbid Raw Water (207.5 points)	Routine Compliance Inspections	5
7	Carlisle Finishing	Turbid Raw Water		6
8	Catawba River	95th% Settled = 1.96 NTU 95th% Filtered = 0.18 NTU	Technical Assistance; New treatment train under construction	19
9	Abbeville	95th% Settled = 1.97 NTU 95th% Filtered = 0.12 NTU	Technical Assistance	12
10	Bennettsville	95th% Filtered = 0.69 NTU Ave. Filtered = 0.12 NTU		2

During 2019, 41 of the 60 surface water treatment plants were optimized for turbidity. The optimization program continues to be discussed during the annual sanitary survey at each surface water treatment plant. Charts and data for the time since the last survey of that water system are presented and discussed. The sanitary survey report also contains an in-depth section on the optimization and reporting of plant performance.

DBP Optimization

The DBP goals used to determine optimization were developed by the EPA Technical Support Center. DBP data is collected by the team and input into spreadsheets. To determine optimization with respect to the DBP goals, locational running annual averages (LRAA's) are

calculated and the maximum LRAA is taken from each location for a 1-year period. All of the maximums are averaged, and the average of these maximums must be less than 60 ug/l for trihalomethanes (THMs) and less than 40 ug/l for haloacetic acids (HAAs).

Average of Maximum LRAA Determination Worksheet (example data)

System Name	Sample Site	2013				2014			
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
	1	27	69	101	44	24	59	120	35
	2	30	75	95	53	35	90	128	55
	3	29	52	78	41	21	50	98	37
	4	25	79	105	53	21	36	90	26
	LRAA 1	4 Quarters are for site 1			60	60	57	62	60
	LRAA 2	" "			63	65	68	77	77
	LRAA 3	" "			50	48	48	53	52
	LRAA 4	" "			66	65	54	50	43
	MAX LRAA	Max from any site			66	65	68	77	77
	Avg of Max LRAA's								**71**
	DBP Goal								60

South Carolina continues to show DBP optimization success at our surface water treatment plants and the distribution systems they serve. The tables below show the number and percent of surface water treatment plants and distribution systems they serve that were optimized for DBPs in 2018.

DBP Status Component (Surface Water Systems)

Optimization Metric	2019 *n=52*		2018 *n=51*	
	Count	Percent	Count	Percent
Met THM Compliance	51	98%	50	98%
HAA Compliance	52	100%	51	100%
THM Goal	46	88%	46	90%
HAA Goal	49	94%	41	80%
TOC Goal	51	98%	40	78%
ALL Goals	42	81%	31	61%

DBP Status Component (Surface Water Purchase Systems, *n*=157)

Optimization Metric	2019 *n=158*		2018 *n=157*	
	Count	**Percent**	**Count**	**Percent**
Wholesalers in compliance	158	100%	156	99%
Wholesalers met goals	145	92%	95	61%
THM Compliance	153	97%	156	99%
HAA Compliance	158	100%	157	100%
THM Goal	141	89%	138	88%
HAA Goal	156	99%	150	96%
ALL Goals	139	88%	136	87%

TPI Implementation

List of Activities

During the past 12 months, SCDHEC's AWOP team has facilitated and participated in numerous technical assistance and optimization activities. The table below represents some of the major achievements during this time.

Date	Activity	Topics/Results
March 2019	Multi-State Planning Meeting	Program Exposure Awareness & Recognition
March 2019	State of South Carolina Annual AWOP Report 2019	Program Exposure, TPI, Impact/Lesson Learned
May 2019	SC Turbidity & DBP Summary Submission to NOLT	Program Exposure, TPI, Impact/Lesson Learned
July 2019	Participation in National AWOP meeting, Cincinnati OH	Program Exposure Awareness & Recognition
June 2018	South Carolina's FY 2017 Report – PWSSP (AWOP)	Program Exposure Awareness & Recognition

Description of Tools & Site Selection

Building Awareness & Recognition

Since the beginning of AWOP in South Carolina, our team has worked to continually build awareness of the importance for optimized performance. Though the team members have changed, the importance of optimization has not diminished. With the advent of disinfection byproducts optimization, the program focus has broadened with the addition of more technical aspects and new tools for improving optimized performance.

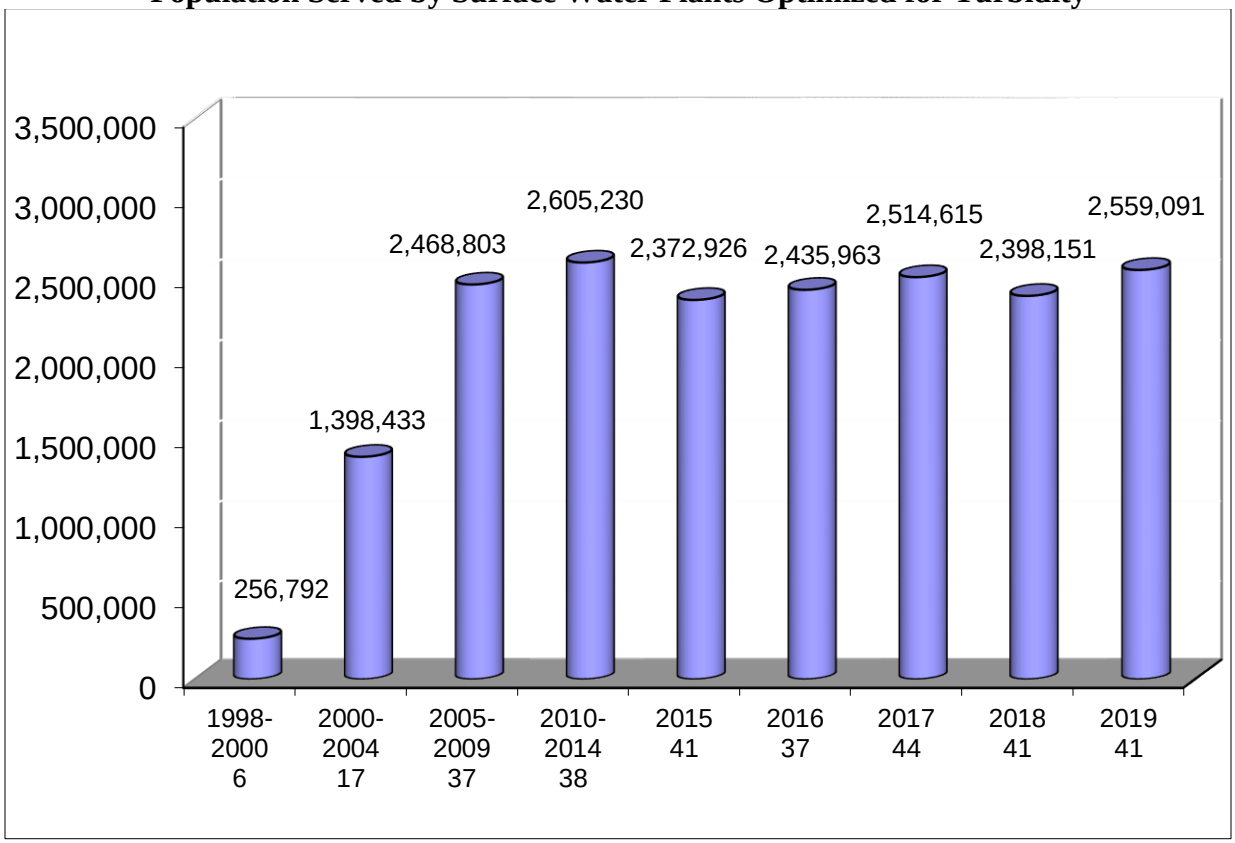
The AWOP awards and recognition program, initiated in 2001, has been held annually to celebrate the water system's accomplishments. Many water systems that receive an award have accompanying press releases in their local media outlets..

AWOP Impacts

Tangible Impacts from Targeted Activities

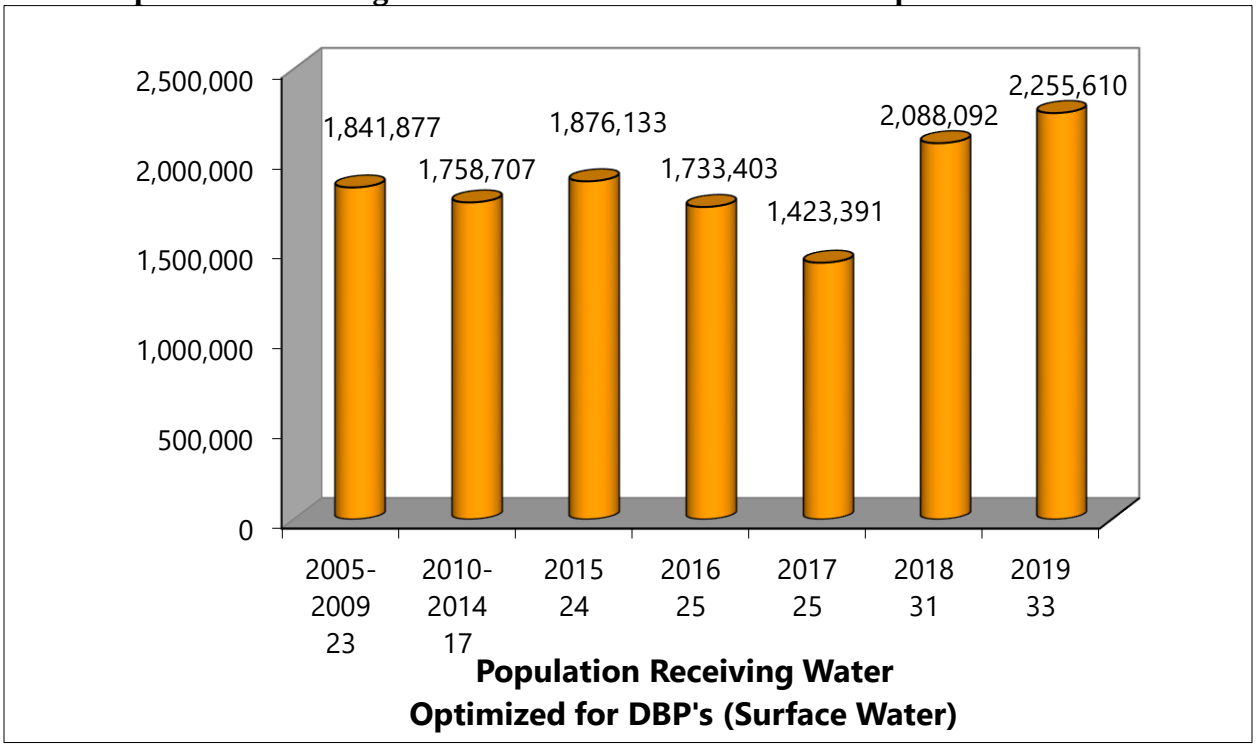
Below is a table showing the number of population in South Carolina that receive water from a surface water treatment plant optimized for turbidity removal.

Population Served by Surface Water Plants Optimized for Turbidity



The above chart shows the population served by optimized plants. The population served by optimized plants (met settled & filtered goal) was 48,799 in 1998 and approximately 2.5 million in 2019. In 2019, approximately 3.0 million people in South Carolina were supplied with drinking water from surface water plants (State population 4.5 million). Approximately 80% of those people received drinking water from a plant optimized for microbial protection.

Population Receiving Water from Surface Water Plants Optimized for DBP's



The above chart shows the population receiving water from DBP-optimized plants (surface water treatment plants). Most water systems in South Carolina do not have trouble meeting the TOC or THM goals. Of the 3 million people statewide supplied by surface water, 2.25 million were served drinking water by DBP-optimized plants in 2018.

Intangible Impacts from Targeted Activities

Inspiring Innovation:
Since the beginning of the program, SCDHEC's AWOP team has been recognized as a national leader in the program. Team members are routinely called upon to present at national meetings and regional workshops. The worksheets and innovative approaches to data management and collection have been shared with and adopted by other states. Our staff is often asked by other states to assist with their inspections and comprehensive water plant and distribution system evaluations.
Embracing Service:
Our team has found that the regulated community wants to exceed the present regulatory requirements to prevent violations and enforcement actions. AWOP has been very helpful in South Carolina by reducing non-compliance, developing a better relationship with the regulated community, and helping build expertise in both our staff and water treatment professionals.

Relationships with the regulated community:
In South Carolina, the regulated community continues to respond to the raised scrutiny on public health protection. Through the optimization efforts, most drinking water operators view

themselves as professionals responsible for their customers' well-being. With the implementation of each new federal drinking water regulation, the water systems learn to adjust operations and to think of regulatory requirements as minimums, not targets.

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AWOP Testimonials:

"*The South Carolina Area Wide Optimization Program has aided us in producing water that is at a greater level of public health protection by exceeding regulatory requirements for particle removal. Twice a year, we host citizen awareness groups called "Inside Rock Hill". During the tours, we show these citizens our live SCADA data. Most citizens are amazed and appreciative when they can witness the turbidity levels decreasing as it moves throughout treatment to our finished product."*

Susan Featherstone, Water/Wastewater Superintendent, City of Rock Hill

"The EPA Region 4 AWOP Team wants to acknowledge the tremendous leadership of DHEC in supporting AWOP both in South Carolina and nationally. From the support of senior levels of management right through to the ranks of staff in DHEC's Drinking Water Protection Division, the continued commitment shown by this agency is second to none among states involved in the program. SC AWOP staff here represent your work very effectively to the national network. We at EPA count them as national leaders of this program."

EPA Region 4 AWOP Team, Drinking Water Section, Atlanta, GA

Lessons Learned

SCDHEC's AWOP program continues to serve as a model for other programs to do more with less (i.e. getting the most out of what you have). "Optimization thinking" has been encouraged in other program areas. Because South Carolina AWOP bridges across several sections (compliance, monitoring, permitting, SRF), managers and staff in the other programs have been exposed to AWOP and made aware of the successes.

Division of Drinking Water & Recreational Waters Protection