



# All Rise for Safe Water: Federal and Local Opportunities to Support Manufactured Housing Communities

**Thank you for  
joining us.  
The webinar will  
begin shortly.**

# All Rise for Safe Water: Federal and Local Opportunities to Support Manufactured Housing Communities

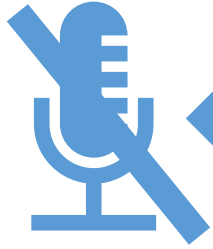
April 7, 2020



**Liana Prudencio, Ph.D.**  
**ORISE Researcher**  
**Drinking Water Protection Division**  
**Office of Ground Water and Drinking Water**



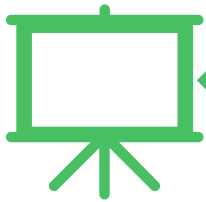
# Welcome!



All attendees are in listen-only mode



Please ask questions throughout the presentation using the Q&A feature to be answered at the end of the webinar.



A copy of the slides has been emailed to all registered attendees.

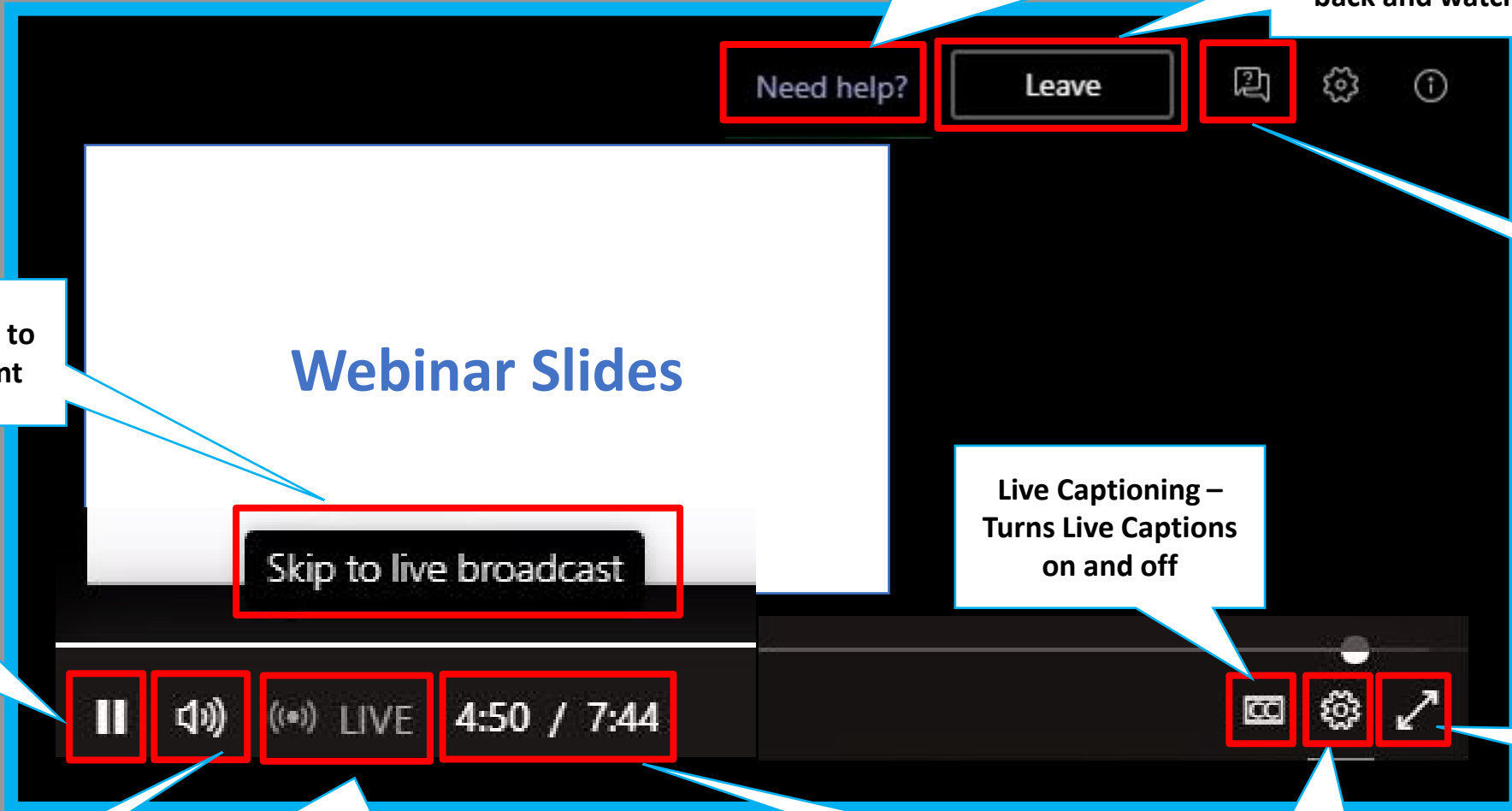


Check out <https://www.epa.gov/dwreginfo/drinking-water-training> for more drinking water webinars and trainings.

# Live Events Controls

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Pause - At any time during the event you can Pause it

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Live Captioning – Turns Live Captions on and off

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# Attendee Q&A

Attendees can submit Questions and Comments through the Q&A. Questions will be asked and answered at the end of the webinar.

The image displays three sequential screenshots of a 'Live event Q&A' interface, illustrating the process for attendees to submit questions and view them.

- Left Screenshot:** Shows the top navigation area. A callout box labeled 'Show/hide Q&A' points to a speech bubble icon in the top right corner. Below the navigation, there are tabs for 'Featured', 'My questions', and 'Most recent'. A large blue button at the bottom is labeled 'Ask a question'.
- Middle Screenshot:** Shows the 'Ask a moderator' section. A callout box labeled 'Type your question' points to the text input field. Below the input field is a checkbox labeled 'Post as anonymous' and a blue submit button with a right-pointing arrow.
- Right Screenshot:** Shows the 'Live event Q&A' list. A callout box labeled 'All published questions show up in Featured' points to the 'Featured' tab. Another callout box labeled 'All of your questions and comments show up in My questions' points to the 'My questions' tab. Below the tabs, a question from 'Anonymous (You)' is visible.

Additional callout boxes provide further instructions:

- 'Click to submit a Question or Comment' points to the 'Ask a question' button in the left screenshot.
- 'Click to submit your Question' points to the submit button in the middle screenshot.



## Disclaimer

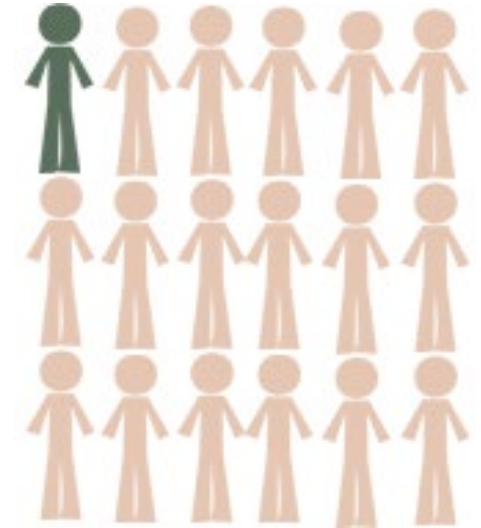
This research was supported in part by an appointment to the Research Participation Program at the Office of Ground Water and Drinking Water, U.S. Environmental Protection Agency, administered by the Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and EPA. The views expressed in the following presentations are those of the speaker(s) and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency. Any mention of trade names or commercial products does not constitute EPA endorsement or recommendation for use.

# Background on Manufactured Homes

- ~22 million Americans live in a manufactured (aka mobile) home
- Often in rural areas or commercial- and industrial-zoned areas
- Residents more ethnically diverse than the general U.S. population<sup>1</sup>
- Experience reduced water service reliability and increased likelihood to have contaminant levels in their drinking water that put their health at risk compared to other housing types<sup>2,3</sup>



**1 in 7 new homes built  
annually is a  
manufactured home**



**1 in 18 Americans  
lives in a  
manufactured  
home**

# Project Objectives

To better understand the state of drinking water systems in manufactured housing communities and identify the challenges and needs of these communities to improve federal and local support.

## Data and Methods

1. SDWIS data on systems that primarily serve “Mobile Home Parks”
  - Trend analysis: Mann-Kendall Test and Sen Slope Estimation<sup>4,5</sup>
  - More than 30 maps developed to identify hotspots of different categories of drinking water violations
2. Case studies: examples of manufactured housing communities that overcame SDWA compliance issues



# Trend Analysis

Violations Over Time Results from Mann-Kendall Test and Sen's Slope Estimation (0.05 alpha level)

	Significant Trend?	Annual Rate of Change
<b>All Violations</b>	Yes	+192 violations per year
<b>Health-Based Violations</b>	Yes	+13 violations per year
<b>Lead and Copper Violations</b>	Yes	+11 violations per year
<b>Total Coliform M&amp;R Violations</b>	Yes	-16 violations per year

Annual Net Change Results from Mann-Kendall Test and Sen's Slope Estimation (0.05 alpha level)

	Significant Trend?	Annual Rate of Change
<b>All Violations</b>	Yes	-180 violations per year
<b>Health-Based Violations</b>	Yes	-15 violations per year
<b>Lead and Copper Violations</b>	No	—
<b>Total Coliform M&amp;R Violations</b>	Yes	-65 violations per year

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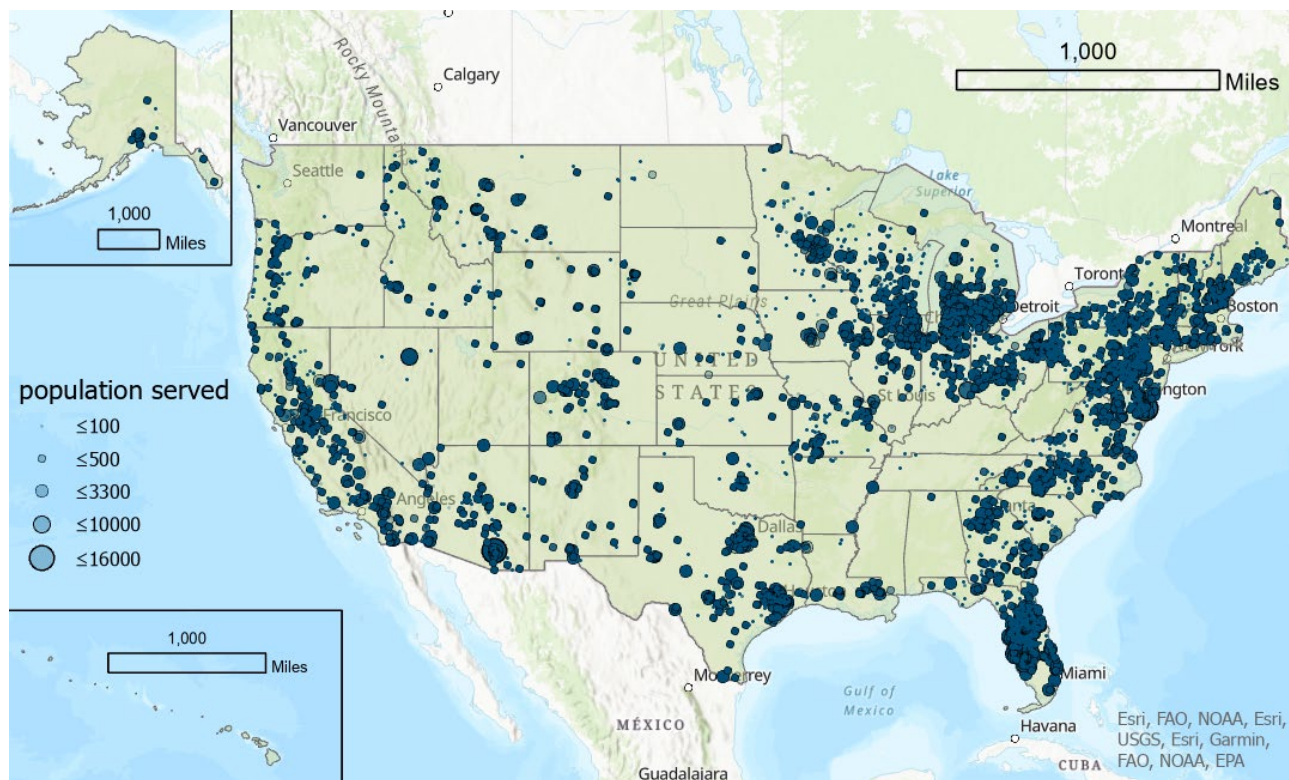
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# Mapping of SDWIS Data

Drinking Water Violations for Systems Primarily Serving Manufactured Homes (1976 through Q2 2020)



**Manufactured housing communities are served by small and very small drinking water systems**



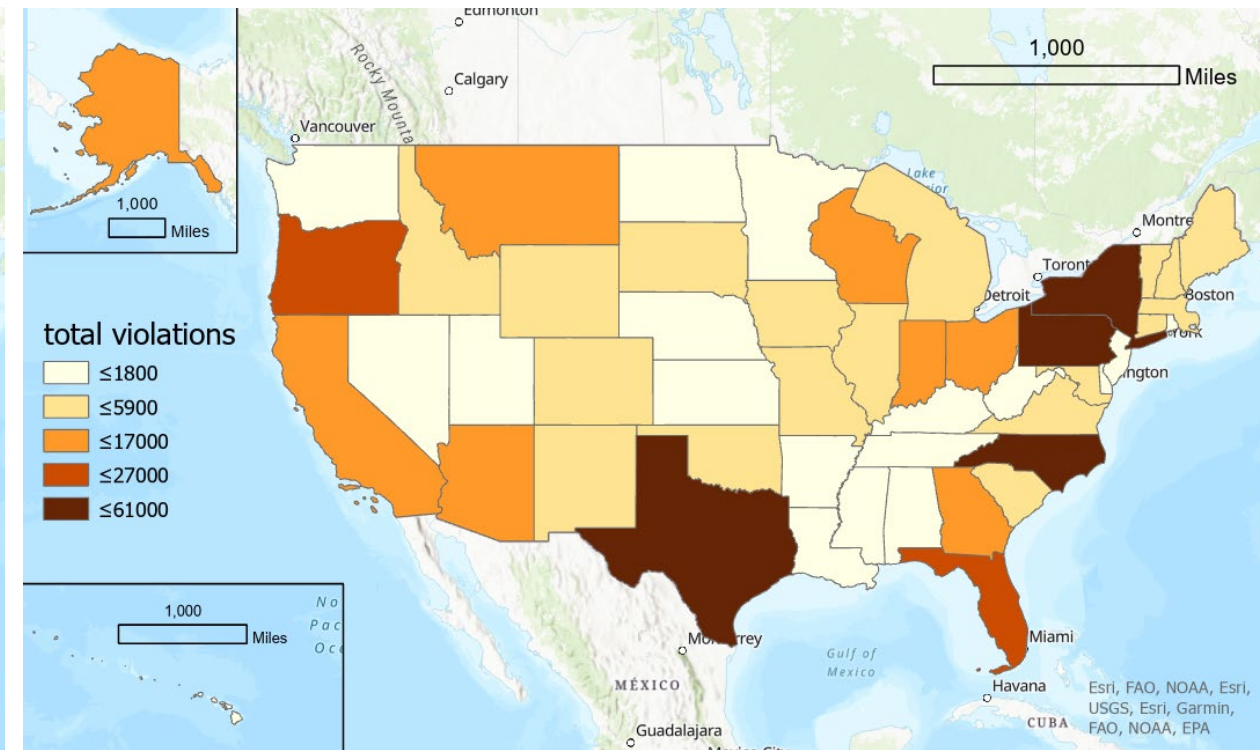
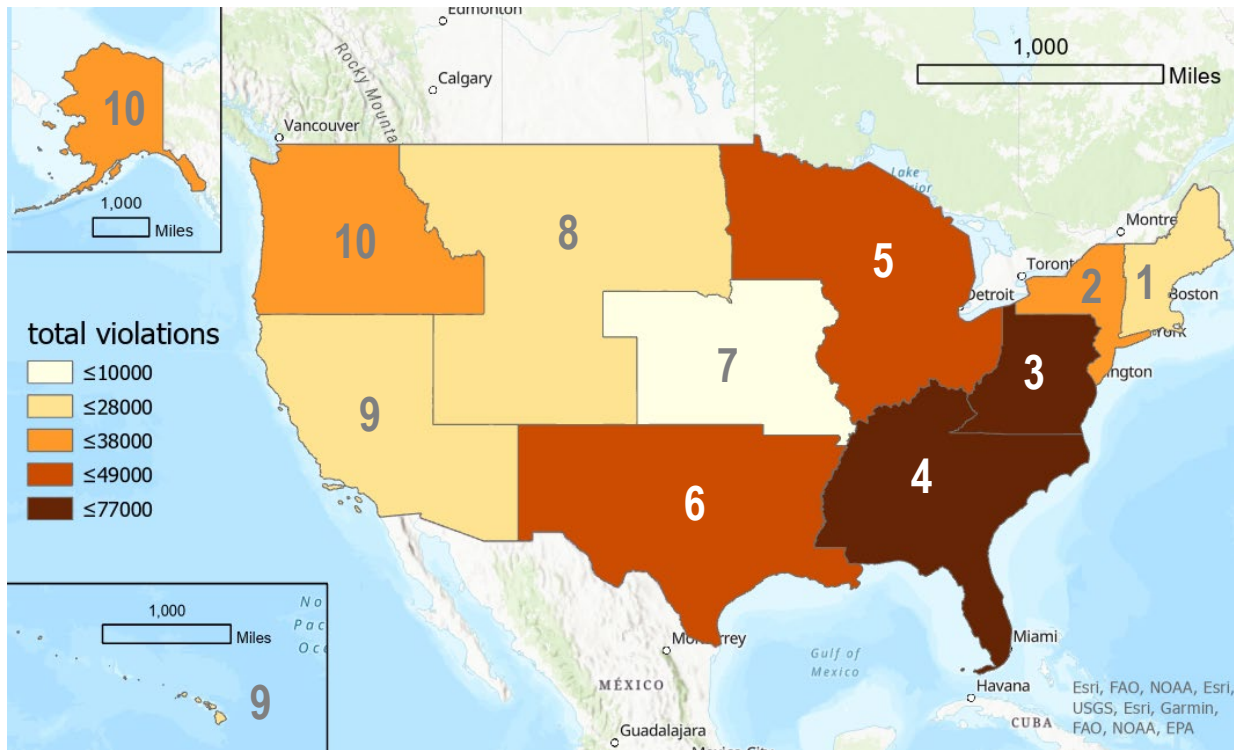
~99.8% are small systems (<3,300 people)

~18% very small systems (<50 people)

*\*Data was not available for: American Samoa DC, Guam, Northern Mariana Islands, Puerto Rico, Trust Territories, U.S. Virgin Islands*

# EPA Regional and State Heat Maps

**Total Violations (1976 through Q2 2020)**



*\*Data was not available for: American Samoa DC, Guam, Northern Mariana Islands, Puerto Rico, Trust Territories, U.S. Virgin Islands*

# Guest Speakers



**Sandi Spiegel**  
Delaware Department of Health &  
Social Services



**Amanda Ames**  
Louisiana Department of Health



**Melissa Blake**  
Louisiana Department of Health

# All Rise for Safe Water: Federal and local opportunities to support manufactured housing communities

More than 22 million Americans live in manufactured or mobile homes, and residents are more ethnically diverse than the general population. Research has shown that these communities experience reduced water service reliability and have an increased likelihood of having contaminant levels in their drinking water that put their health at risk compared to other housing types.

Guest speakers from Louisiana and Delaware will share case studies, where a state judicial approach and Drinking Water State Revolving Funds were used to help manufactured housing communities with Safe Drinking Water Act compliance issues. These case studies are highlighted to provide insight on different methods available to assist in the delivery and protection of safe drinking water for these vulnerable communities.



**Amanda Ames**  
[Louisiana](#)  
[Department of Health](#)



**Melissa Blake**  
[Louisiana](#)  
[Department of Health](#)



**Sandi Spiegel**  
[Delaware](#)  
[Department of Health & Social Services](#)



**Liana Prudencio**  
[ORISE](#)  
[Researcher at US EPA](#)  
[OGWDW](#)

**12:30-1:30pm ET**  
**Wednesday, April 7, 2021**  
**Microsoft Teams Live Event**





*DELAWARE HEALTH  
AND SOCIAL SERVICES*  

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*Division of Public Health*



# Delaware

DEPARTMENT OF HEALTH AND SOCIAL SERVICES  
DIVISION OF PUBLIC HEALTH  
DRINKING WATER STATE REVOLVING FUND







# Mrs. Sandi Spiegel

## DWSRF Program Administrator

# Delaware

DEPARTMENT OF HEALTH AND SOCIAL SERVICES  
DIVISION OF PUBLIC HEALTH  
DRINKING WATER STATE REVOLVING FUND



Email: [Sandi.Spiegel@Delaware.gov](mailto:Sandi.Spiegel@Delaware.gov)

Website: <https://www.dhss.delaware.gov/dhss/dph/hsp/dwsrf.html>



Dela(where)?



## *Size comparison*

<b>Size (miles)</b>	<b>Delaware</b>	<b>Texas</b>
Length (longest)	<b>96</b>	790
Width (narrowest)	<b>9</b>	--
Width (widest)	<b>35</b>	660

- Delaware population is ~975,000
- Texas population is ~29,000,000



# Delaware's Endless Discoveries

- ❑ In Delaware, public and private water systems get their drinking water from surface water like the Brandywine, White Clay and Red Clay creeks and reservoirs, or from groundwater aquifers.
- ❑ In Delaware, the lowest point is sea level and the highest is 450 feet above sea level (at PA border).



# Manufactured Home Community (MHC) Drinking Water State Revolving Fund (DWSRF) System Compliance Assistance Strategies

- Forest Park – Set Aside Activities
- Holiday Pines - Regionalization





## Forest Park

Recalcitrant System Returns to compliance through a collaborative effort among EPA, DHSS's Office of Drinking Water, Office of Engineering and DWSRF Technical Assistance contract with the Delaware Rural Water Association (DRWA)

**DWSRF \$:** 0; 100% system funded for nitrate removal and upgrades; Technical Assistance via Set-Aside Activities

**Population:** 46 persons; 25 connections





# Forest Park

**Problem:** Forest Park has been on EPA's ETT list for several years with numerous violations including nitrate exceedances.

**Solution:** The Park owner worked with DWSRF's Technical Assistance Provider, DRWA to return to complete compliance using the 2% and 15% Set-Asides



# Forest Park

EPA Issued:

Notice of Violation on 3/22/17

Administrative Order on 7/5/17

Close out letter issued in November/December 2017







# Forest Park



Timeline to compliance 2017...



**May 10**

EPA Region 3 contacts DE DWSRF for assistance

**May 16**

Conference call with:

EPA R3

DE DWSRF

Office of Drinking Water

Health Systems Protection Leadership

**May 22**

Meeting with:

Forest Park Owner

DRWA

Source Water Protection-DNREC

**May 24**

Owner contacts 2 water treatment companies for preliminary consults

DRWA Begins work on CCRs for 2013, 2014, 2015, and 2016



**June 7**

Water treatment contractor selected

Lead/Copper samples collected

**June 13**

Floor in converted shed prepped for concrete installation

**June 19**

CCRs reviewed by ODW

Contract signed with Water treatment contractor

Lead/Copper Sampling Plan started



## July 13

Plans received by the Office of Engineering for nitrate removal equipment installation

## July 31

Nitrate removal equipment installed

## August

CCR Compliance achieved

Nitrate Compliance achieved

Owner completed Sampler/Tester course (8/29/17)



# DRWA Performed 10 site visits totaling 21.5 hours

This did not include:

Phone and email correspondence with

Treatment contractor

Regulatory officials

CCR Preparation





## Holiday Pines



Recalcitrant System Returns to compliance due to regionalization with a private water company, Tidewater Utilities Inc.

**DWSRF \$:** \$1,578,667.43

**Population:** >200 persons



# Holiday Pines

**Problem:** Holiday Pines is small mobile home community, lacking managerial capacity. A recalcitrant owner and CCR, lead/copper issues plagued public health authorities and residents for many years.

**Solution:** Tidewater Utilities Inc., a for-profit company in southern Delaware purchased the system for a nominal fee and interconnected it with one of their existing water districts.





# Holiday Pines

The interconnection bolsters managerial capacity, provides storage, a more consistent water source, and fire protection.







# Holiday Pines

Although water quality was not an issue, other public health and public communication requirements were not being met. The project relieved the owner of a burdensome and antiquated water system, which he inherited.



# Manufactured Home Community (MHC) Drinking Water State Revolving Fund (DWSRF) System Compliance Assistance Strategies

- Forest Park – Set Aside Activities
- Holiday Pines - Regionalization





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Website: <https://www.dhss.delaware.gov/dhss/dph/hsp/dwsrf.html>

# LOUISIANA ENFORCEMENT: LEGAL ACTIONS



Amanda Ames, P.E.  
LDH Chief Engineer

Melissa Blake  
LDH Attorney

# ENFORCEMENT IMPROVEMENTS

- DWRLF Consolidation program
  - Closed 4 loans over the past year totaling ~\$9M
  - Inactivated 4 systems that had administrative orders
- Began making orders executory
  - Get in front of a judge!
- Going forward:
  - Legislation including better consolidation authority, water system grading, improved receivership authority

# REGIONAL OVERVIEW

- Abundant area of groundwater
  - Many small, independently minded systems
  - Additional water quality regulations have made small system compliance difficult
    - Minimal Cl<sub>2</sub> residual
    - Ammonia, Iron, Manganese, organics
- In this case:
  - Katrina funds:
    - Typically no match required
    - Quick construction, difficult oversight
  - Deferred maintenance
    - due to small customer base, difficult to overcome financial cost

# RV PARK IN ST TAMMANY PARISH

- Population Served: 87
  - Service Connections: 29



# WATER VIOLATION HISTORY

- Historical violations/Intermittent compliance since 2006
- Major violations began in 2015
- District court Injunction ruling granted against co-owners
- Rule for contempt filed in 2016
  - Sparked compliance for a time (~2 years)
- 2018-2020:
  - 18 E. coli positive samples
  - 7 Level 2 Assessments performed
  - Boil order issued in 2019



# RECENT WATER VIOLATIONS

- Well
  - No second source
  - No flowmeter
- Monitoring Plan
  - Incorrect sample site locations
  - Improper sampling taps (nozzle and piping)
- Chemical Feed
  - No Secondary containment
  - Maintain Cl<sub>2</sub> residuals
  - No Calibration of feed system
  - Incorrect dosing equipment
- Hydro-pneumatic Tank
  - No bypass
  - No control equipment
- Other
  - Chlorine records
  - CCCP
  - O&M Plan
  - Cover exposed water lines
  - Certified Operator

# SITE WATER SYSTEM



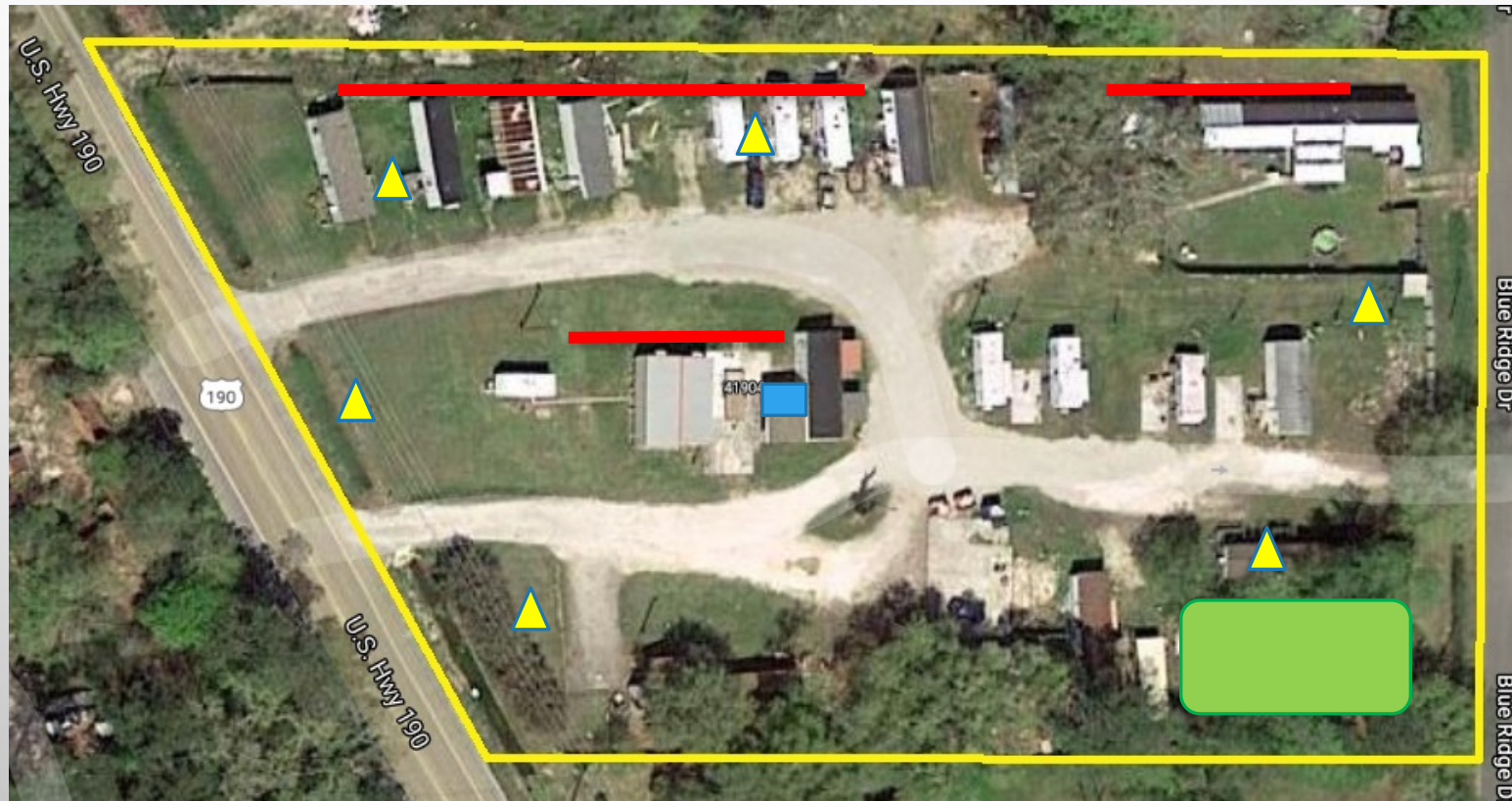
# SEWER VIOLATION HISTORY

- Violations began in 2019
- Compliance Order issued by health department
- Order made Executory in district court

# RECENT SEWER VIOLATIONS

- **LAC 51:XIII.305.A** – A person shall not directly or indirectly discharge, or allow to be discharged, the contents or effluent from any plumbing fixtures, vault, privy, portable toilet, or septic tank, into any road, street, gutter, ditch, water course, body of water, or onto the surface of the ground.
- **LAC 51.XIII.505.A** – All component facilities of a community sewerage system shall, at all times, be maintained in the same configuration as permitted, in working order and operated efficiently to minimize upsets, discharges of excessive pollutants, bypassing of discharges from the system, and health hazards and nuisances
- **Sewer Collection**
  - Lines Need repair
  - Lines need to be buried
  - Sewer caps/ system must be sealed
  - SSO need to be cleaned and disinfected
- **Treatment Plant**
  - Needs current LDEQ discharge permit
  - Remove Vegetation
  - Aeration equipment in plant needed and sludge removed
  - Chlorination required
  - Security fence required
  - Need certified operator

# SITE SEWER SYSTEM



# SEWER SYSTEM PHOTOS



Two cell aeration pond



Service connections



Exposed/Broken mains



# COURT CONSOLIDATION

- 2020 – Consolidation of sewer and water cases – one Judge
- Filed rule for contempt on both

# JUDICIAL PROCEEDING AND CONTEMPT

- Evidence – photos, historical violations
- Engineering team – expert witnesses
- Guilty verdict – contempt on both water and sewer violations
- Penalty
  - 30 days in prison for co-owners (suspended)
  - \$1000 fine



# CURRENT VIOLATION STATUS

## WATER

- **Well**
  - **No second source**
  - **No flowmeter**
- **Monitoring Plan**
  - **Incorrect sample site locations**
  - **Improper sampling taps (nozzle and piping)**
- **Chemical Feed**
  - **No Secondary containment**
  - **Maintain Cl<sub>2</sub> residuals**
  - **No Calibration of feed system**
  - **Incorrect dosing equipment**
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  - **No bypass**
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- **Other**
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  - **CCCP**
  - **O&M Plan**
  - **Cover exposed water lines**
  - **Certified Operator**

## SEWER

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  - **Remove vegetation**
  - **Aeration equipment in plant and sludge removed**
  - **Chlorination required**
  - **Security fence required**
  - **Need certified operator**

# CURRENT STATUS PHOTOS

## WATER

Before



After



## SEWER

Before



After



# COMPLIANCE

- All violations remediated
- Fines paid
- Sewer and water woes eliminated for citizens

# CONTACT INFORMATION

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LDH Attorney  
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# QUESTIONS AND DISCUSSION

# References

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