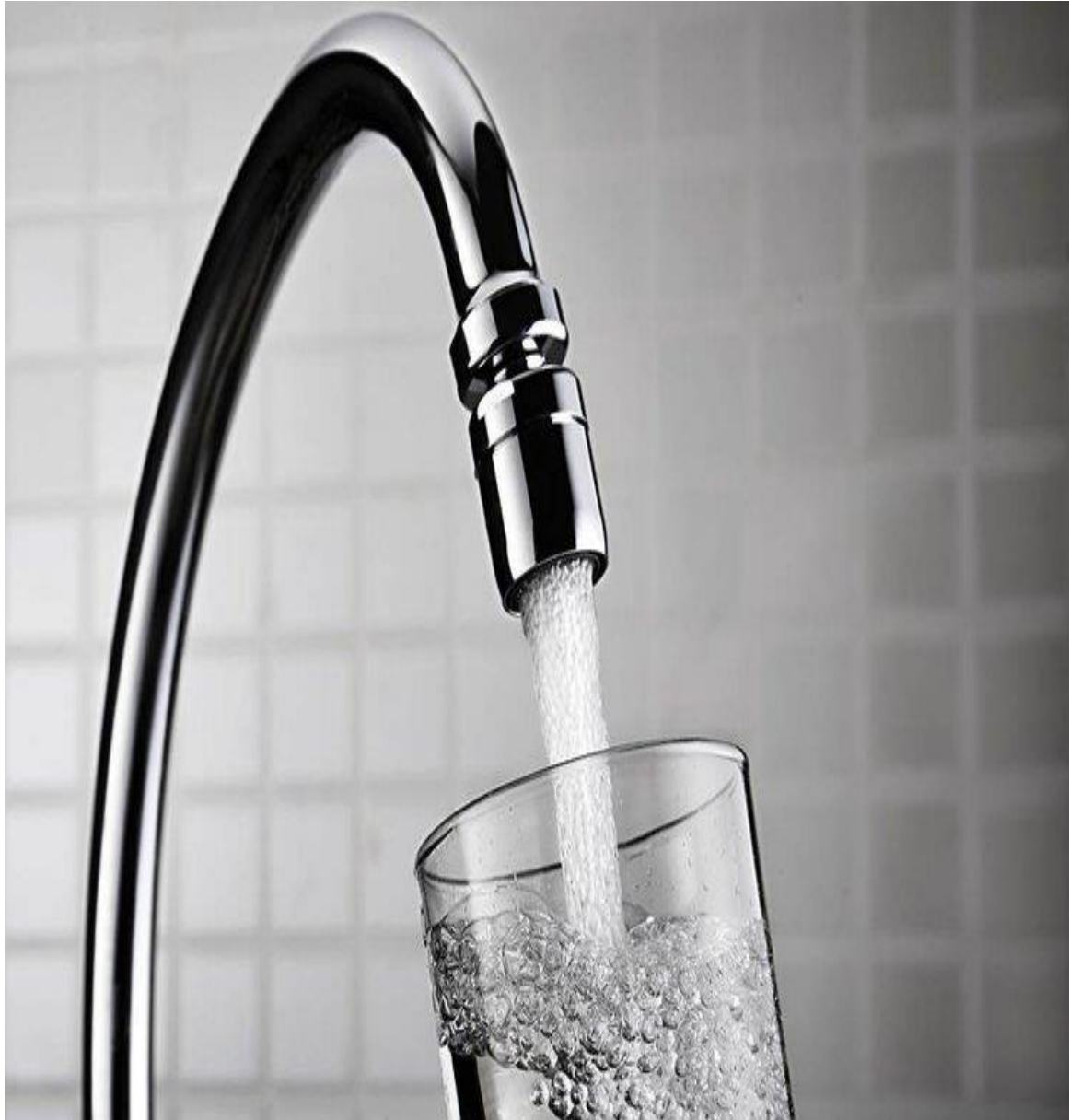


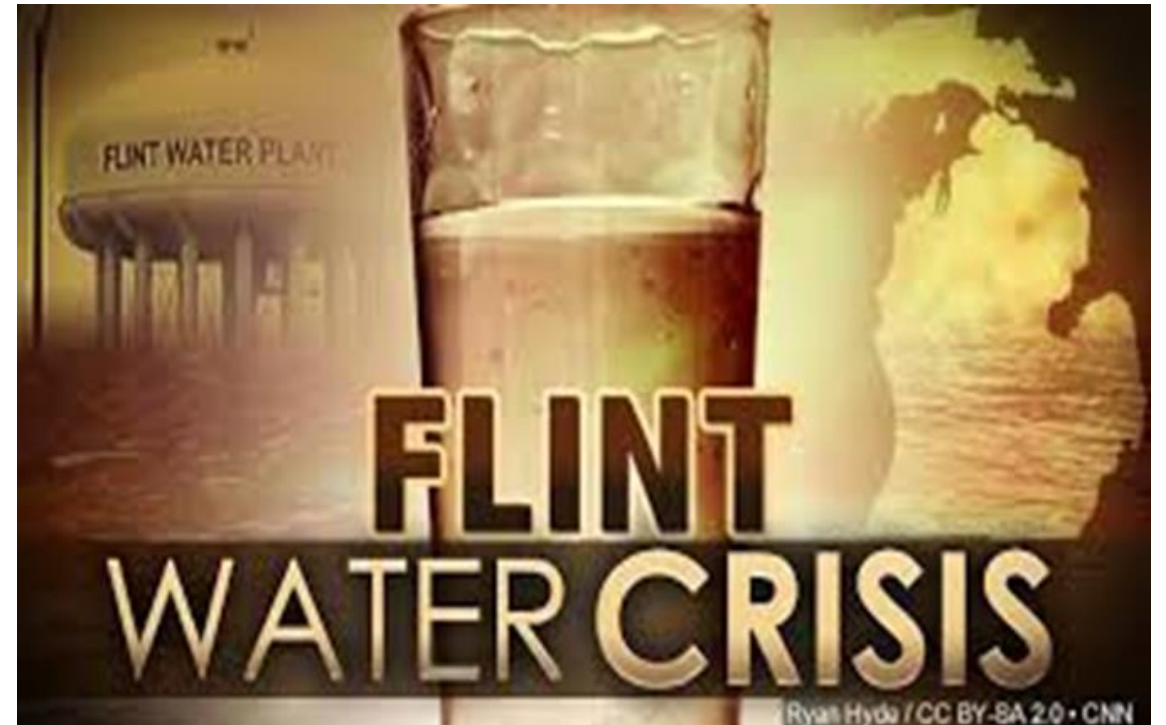
LESSONS FROM FLINT:

Mitigating the Potential Health Threat of Lead
Contamination in Jackson, MS Homes

Sheryl L. Bacon, MPA
Jackson State University



Due to the severity and scale of the water contamination crisis in Flint, Michigan, the issue of water quality in urban areas has recently become a serious cause for concern for public administrators.





Their Water



Your Water



Serious health problems caused by lead exposure and ingestion:

- Damage to the brain and kidneys
- Diminished red blood cell production
- High blood pressure
- Lowered IQ in children

Even low levels of lead in the blood of children can result in:

- Behavior and learning problems,
- Hyperactivity
- Growth deficiencies
- Auditory problems
- Anemia



Source: United States Environmental Protection Agency



Lead is stored in the bones, and can be released into the body later in life.

During pregnancy, the fetus absorbs lead from the mother's bones, which can affect brain development.

This can prove to have long-term detrimental effects on community outcomes in areas with high levels of lead exposure.

Source: United States Environmental Protection Agency

A National Infrastructure Crisis

- American Society of Civil Engineers reports that there are approximately 1 million miles of pipes delivering water across the nation, many of which date back to the early to mid-20th century.
- 2017, an official report by the ASCE gave the nation's water systems a "near failing" grade.
- The US EPA predicts it will cost approximately \$632 billion over the next decade on infrastructure repair and replacement. The ASCE estimates the cost to be closer to \$1 trillion.
- Federal spending on national water infrastructure has dropped from 63% of costs (1970s) to 9% (2014).
- According to a 2017 investigation by the Natural Resources Defense Council, "nearly one in four Americans" get their water from a system with reported SDWA violations.

Source: "The Beleaguered US Water System", Council on Foreign Relations, 2017



This what they giving us in Jackson, MS 🇺🇸

A 2016 Reuters study of lead testing results across the country found almost 3,000 areas with poisoning rates higher than in Flint, although many of these lead hotspots are receiving little attention or funding (Pell and Schneyer, 2016).

Among those areas is the city of Jackson, Mississippi.

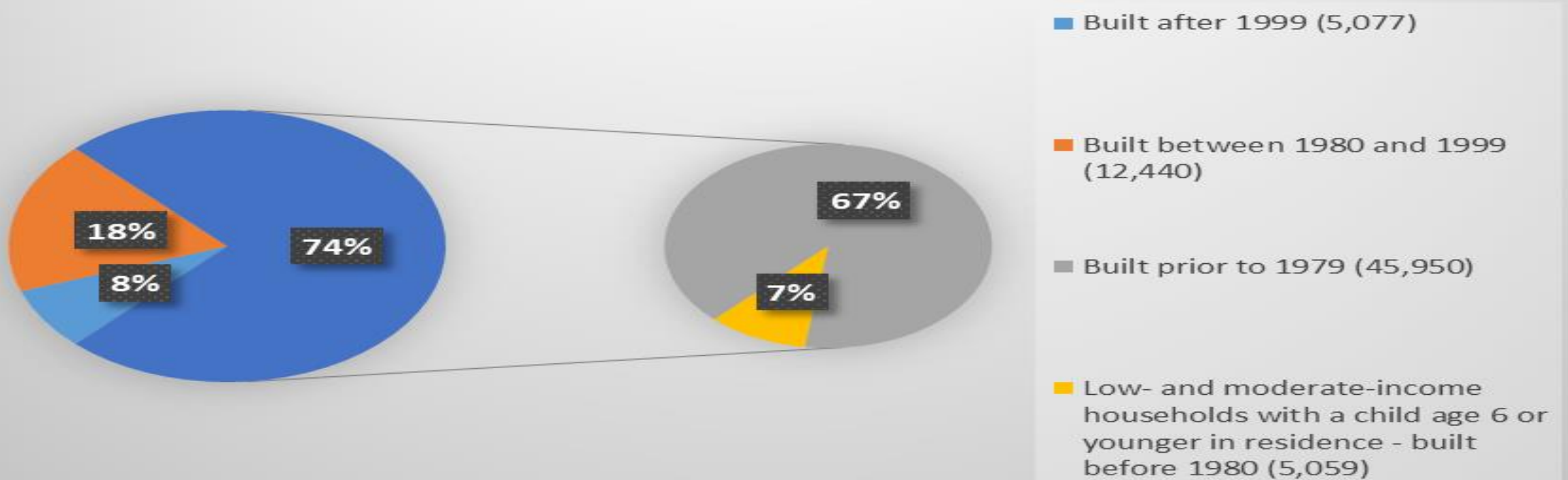
- National Center for Health Housing (in conjunction with the MS Department of Health) reported in 2016 that approximately 208 Mississippi children are newly diagnosed with lead poisoning each year, attributed to the presence of lead-based paint in older homes and drinking lead-tainted water.
- Water infrastructure improvements estimated at \$248.3 million*
- 8% of the system is over 100 years old; 97 miles of 2 to 4-inch pipe needing upgrades*
- Total estimates of necessary infrastructure spending in Jackson exceeds \$743 million between now and 2031; \$664 million of which not yet funded
- Estimates based solely on known problems

* Source: City of Jackson “Bold New Infrastructure Improvement Plan”, March 2015

- Enters drinking water when service pipes corrode (particularly when the water has high acidity or low mineral content)
- Most common problem with brass or chrome-plated brass faucets and fixtures with lead solder, especially running hot water
- Homes built before 1986 are more likely to have lead pipes, fixtures and solder; lead paint likely in homes built before 1978



Prevalence of Aging Housing Structures in Jackson, MS



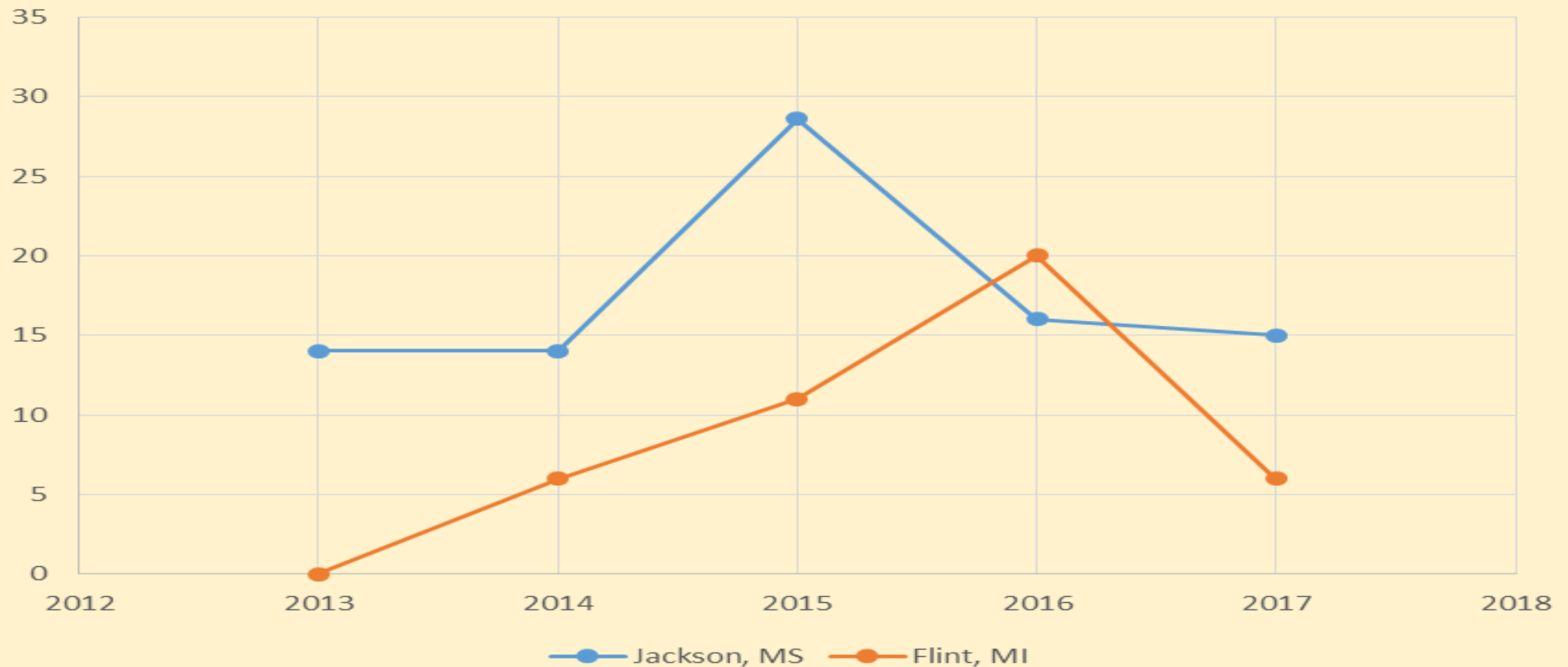
Source: "Selected Housing Characteristics", 2012-2016 American Community Survey (5-Year Estimates). US Census Bureau American Community Survey.

Research Methodology

- **Applied Research – Mixed Method, Comparative Analysis**
- **Examined lead levels in the public water supply (as reported by EPA mandated Consumer Confidence Report (or Water Quality Report), along (2013–2017) for Flint, Michigan; Jackson, Mississippi; and each of the capital cities of the other 10 states in the U.S. Southeastern region (AL, FL, GA, KY, LA, NC, SC, TN, VA, and WV)*.**
- **Also examined strategic treatment and safety plans for each respective city which showed a reduction in lead levels between 2013 and 2017 (Tallahassee, FL; Baton Rouge, LA; Flint, MI; Columbia, SC) and compared to Jackson, MS**

*** - “Southeastern Region” as defined by the American Association of Geographers**

Lead Levels Found in Water Quality Testing - Jackson, Mississippi and Flint, Michigan 2013-2017 (in ppb)



Water Quality Reports for Capitol Cities of the Southeastern United States

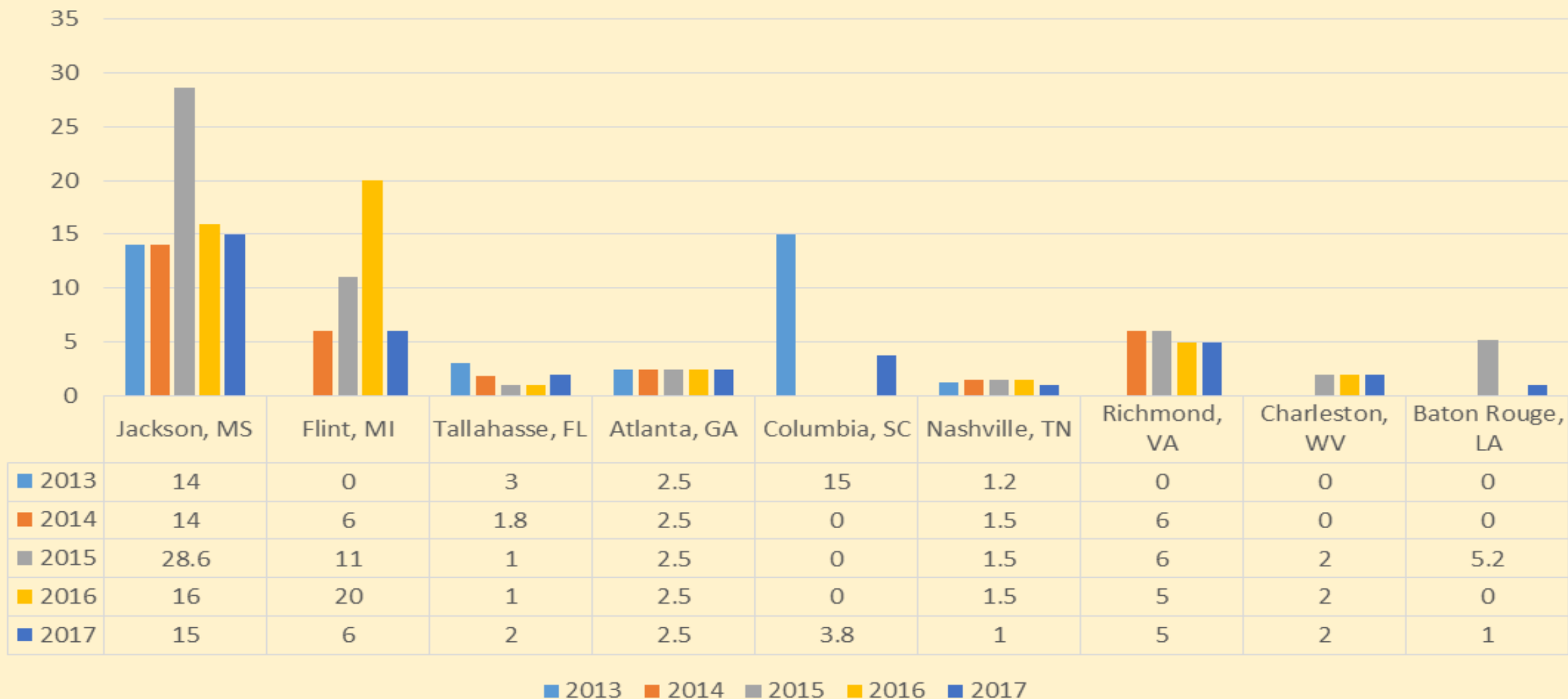
2013–2017

	Montgomery AL	Tallahassee FL	Atlanta GA	Frankfort KY	Baton Rouge LA	Raleigh NC
2013	ND	3.0	2.5	N/A	N/A	<3.0
2014	ND	1.8	2.5	N/A	N/A	N/A
2015	ND	1.0	2.5	N/A	5.2	N/A
2016	ND	1.0	2.5	N/A	N/A	<3.0
2017	ND	2.0	2.5	ND	1.0	<3.0
2018	ND	2.1	N/A	ND	N/A	N/A

	Columbia SC	Nashville TN	Richmond VA	Charleston WV	Jackson MS	Flint MI
2013	15	1.2	N/A	N/A	14.0	N/A
2014	0	1.5	6.0	<1.0	14.0	6.0
2015	0	1.5	6.0	2.0	28.6	11.0
2016	0	1.5	5.0	2.0	16	20
2017	3.8	1.0	5.0	2.0	15	6.0
2018	N/A	1.0	N/A	N/A	N/A	N/A

**** ND = None detected/non-detectable; N/A = data not available online**

Lead Levels Found in Water Quality Testing 2013 - 2017 (in ppb)



Comparisons Between Jackson, MS and Flint, MI

- In the 2015 Jackson sampling, 22% of homes exceeded federal action levels, compared to 16.7% of homes tested in Flint, MI.*
- Preliminary testing had reporting that 90% of homes were below 28 ppb in Jackson, while 90% of homes in Flint were below 25 ppb.*
- Both cities had recently changed their water supplier, but in 2016 Jackson changed back to the well system they had switched from in 2014.*
- December 2016 sampling, 11% of homes found to be exceeding federal limits, levels of lead contamination were found to range from 50-476 ppb – the highest level found in the June 2016 sampling was 128 ppb. The highest level reported in Flint, MI was 397 ppb.*
- Ongoing citizen distrust over how the matter was handled by administrators.

* Source: The Guardian (US edition). Kate Galbraith and Matthew Teague. 17 Mar 2016.
<https://www.theguardian.com/us-news/2016/mar/17/high-levels-lead-mississippi-water-flint-michigan>.

Officials Say Flint's Water Is Safe. Residents Say It's Not. Scientists Say It's Complicated.

"It could be five years from now, and I'll still never drink this water."

NATHALIE BAPTISTE APRIL 16, 2018 6:00 AM



Mississippi issues warnings about Jackson tap water

By CNN Staff, CNN

🕒 Updated 2:10 PM ET, Thu February 25, 2016



Story highlights

Lead concerns water warning children

Byram residents you may be drinking contaminants

number of people

This is not a health issue issued severe warning Environment

But while officials emphasize these are merely precautions, it hasn't allayed the concerns of those who use the water from Jackson's system.

In the suburb of Byram, which gets most of its water from Jackson, Mayor Richard White told CNN affiliate WAPT he worries that this has been going on for a while and something should have been done "a long time ago."

Said resident Chantay Steen: "It is frightening to know that you may be drinking water that has contaminants that could be harmful to children, adults, pregnant women. It is concerning."



FY 2015-2019 Five-Year Consolidated Plan and FY 2015 Annual Action Plan

CITY OF JACKSON, MS

July 10, 2015

Public Display Draft

Prepared by:
The City of Jackson Office of
Housing & Community
Development
and Mullin & Lonergan Associates,
Inc.

JUNE 2015

SP-65 Lead based paint Hazards – 91.215(i)

Actions to address LBP hazards and increase access to housing without LBP hazards

The City's efforts to evaluate and reduce paint hazards will take two main directions. First, all housing programs and projects assisted with CDBG and HOME funds are required under HUD and other federal regulations to address these hazards. It is standard practice that any use of funds entails the notification of buyers, owners, and occupants. Depending on the nature and the amount of assistance provided, the type of evaluation and approach may vary.

How are the actions listed above related to the extent of lead poisoning and hazards?

Assistance limited to down payment assistance and closing costs will have different lead-based paint requirements compared to substantial rehabilitation of owner occupied homes. However, all assistance involving housing built prior to 1978 will be subject to lead-based paint rules.

The City of Jackson is currently preparing an application to the Healthy Homes program to address the issue.

How are the actions listed above integrated into housing policies and procedures?

Compliance with these requirements is a provision that is included in all agreements with subrecipients and others receiving funding for housing activities.

The Mississippi State Department of Health in collaboration with the Hinds County Health Department has responsibility for the Lead Poisoning Prevention Program in the county, including the City of Jackson, and serve to address lead hazards. The Hinds County Health Department provides case management services to families and children that have been determined to have elevated blood levels.



JACKSON COMPREHENSIVE PLAN

COMMUNITY FACILITIES ELEMENT

SECTION 6.6

INFRASTRUCTURE

Public infrastructure is the term used to describe the basic facilities, equipment, services and installations needed for the growth and functioning of a community. During the **FABRIC** public process the citizens of Jackson established goals with regard to public service infrastructure. They include:

"Ensure the availability of water to meet future needs through proper system planning, user education and resource management and protection of existing and future water resources."

"Continue the provision of a sanitary sewer system that provides economic and efficient service."

In addition to the goals adopted during Phase I of **FABRIC**, a recent Questionnaire distributed during the Comprehensive Planning process indicated that Drainage was the most frequent issue citizens raised when discussing public services.

Pursuing these goals will require proactive and strategic implementation of a variety of projects as Jackson grows and redevelops.

WATER AND SEWER

The City of Jackson, specifically the Public Works Department, oversees the operation and maintenance of the public infrastructure throughout the City. Currently the City of Jackson operates and is served by two water treatment facilities, the O. B. Curtis facility in Madison County and the J. H. Fewell facility on Interstate 55 just south of the Woodrow Wilson Blvd. exit. The two

COMMUNITY FACILITIES ELEMENT

the current distribution infrastructure or the expansion of such infrastructure in the future. The proposed growth and redevelopment that are advocated by **FABRIC** warrant planning efficient and effective water and sewer systems that can expand with growth and promote appropriate development patterns and timing. A key to developing such systems will be a comprehensive Water and Sewer Master Plan prepared to guide the future expansion of both the production treatment plants and distribution/collection systems. The provision of water and sewer services can have a substantial impact on future growth and development of the city and the surrounding area. Therefore, it is important that the Public Works Department collaborate with other City Departments, specifically the Planning Department, so that future water and sewer improvements are in conformance and support **FABRIC** in a coordinated manner that seeks to meet growth and development goals and priorities.

BRIDGES AND STORM DRAINAGE

The Street, Bridges and Drainage Division of Public Works oversees the administration and implementation of the National Pollutant Discharge Elimination System (NPDES) required by the federal and state Environmental Protection Agencies. This Division also administers floodplain management by enforcing corrective and preventative measures for reducing flood damage. More specific information can be found in the City of Jackson's Flood Plain Management Ordinance and the Storm Water Quality Protection Ordinances.

The City is traversed by over one hundred fifteen (115) miles of major creeks and tributaries, most of which are unimproved. A



The City of Jackson

STRATEGIC PLAN

Investing in the inherent dignity of every citizen in Jackson

INTEGRATED INFRASTRUCTURE PLAN

"As the avenues and streets of a city are nothing less than its arteries and veins, we may well ask what doctor would venture to promise bodily health if he knew that the blood circulation was steadily growing more congested."

- Hugh Ferriss, The Metropolis of Tomorrow

Goal - Safe & Affordable Communities			
INITIATIVE: Integrated Infrastructure Plan (IIP) The CoJ will design and implement an IIP to communicate, coordinate, integrate, prioritize, and execute infrastructure projects in the City	Initiative Lead/Teams Public Works Director	External Partners Jackson Consulting & Engineering Firms	External Funding Municipal Sales Tax Commission
PROGRAMS:			
Execution Strategy	1. Immediate action plan 2. Enterprise GIS for Asset Management 3. Preparation of a Ten-year Infrastructure Plan 4. Program Delivery (Implementing the Ten-year Capital Improvements Program)		
Expected Outcomes	Functional Infrastructure with preventative maintenance		



The Bold New Infrastructure Improvement Plan

An Integrated Plan for Sustainable Infrastructure Improvements and Regulatory Compliance

March 2015



Tony T. Yarber, Mayor

following graphic summarizes the framework used to develop the Infrastructure Master Plan.

Infrastructure Master Plan Framework Development, CIP Planning and Implementation

Integrated Planning

Ensuring the infrastructure improvement program leads to sustainable and comprehensive solutions to achieve regulatory compliance and alignment with the City's policy objectives including Triple Bottom Line (3BL) benefits.

Planning Methodology

Asset management based planning methodology to develop a comprehensive CIP aimed at achieving required levels of service while minimizing risks at the lowest life-cycle costs; aligning with Policy Initiatives and other drivers.

Financing Strategy

Understanding the Sales Tax proceeds are limited in comparison to the need, our team will develop a financing strategy to utilize the sales tax proceeds in a way that balances long-term debt with the ability to leverage external funding sources.

Stakeholder Engagement

Led by the City's Communications and Marketing team, the City will engage external stakeholders including the City Council, Community Groups and local contractors.

Implementation

An aggressive milestone schedule has been established to develop a comprehensive master plan in two phases.

Sustainability and the Triple Bottom Line: Measures of Success

The State of the City's Infrastructure would seem to suggest not only a lack of funding and deferred maintenance, but also the absence of a comprehensive and holistic plan. The Yarber Administration has made **SUSTAINABILITY** the cornerstone of this Infrastructure Improvement Program. Sustainability is:

- Meeting current environmental, social, and economic needs of our community without compromising the ability of future generations to meet these needs

Compliance Plan for City of Jackson (MS0250008)

Kishia Powell, P. E., Legally Responsible Official

Cynthia Hill, Designated Certified Operator

February 12, 2016

To fulfill this Compliance Plan, the City of Jackson must accomplish the following items within the time periods specified. The Legally Responsible Official:

- Must identify an individual or firm providing professional engineering service to the City of Jackson for drinking water matters and provide the name or firm by written notice to the Director of the MSDH Bureau of Public Water Supply on or before February 22, 2016.
- Must provide the required Public Education pamphlet to all City of Jackson Water System customers no later than February 29, 2016. Written certification that notification was provided must be delivered to the Director of the MSDH Bureau of Public Water Supply on or before March 2, 2016.
- Must provide the required Public Education pamphlet to all Child Care Centers, Head Start Centers, Schools, Healthcare Facilities and any other locations where the City of Jackson is aware of children in congregate settings no later than February 19, 2016. Written certification that notification was provided must be delivered to the Director of the MSDH Bureau of Public Water Supply on or before February 24, 2016.
- Must submit an engineer-designed corrosion control study and plan for optimization of water treatment for the City of Jackson Water System to the Director of the MSDH Bureau of Public Water Supply on or before April 4, 2016. Once reviewed sufficient by the MSDH Bureau of Public Water Supply, the plan will be monitored by City of Jackson assigned engineer(s) and results will be submitted to the Director of the MSDH Bureau of Public Water Supply at intervals approved in the plan. The plan shall include, at a minimum, corrosion control studies that will continue for the next ten compliance cycles.
- Must submit a map with all samples for the 01/01/2016-06/30/2016 monitoring period plotted with delineation between lead detections and non-detections. The map will be used by the City of Jackson to develop a plan for Water Quality Parameter (WQP) testing which must be submitted to the Director of the Bureau of Public Water Supply for review by March 15, 2016. Following review, the MSDH Bureau of Public Water Supply will work with the City to determine sampling frequency and specific testing locations for the required WQP monitoring.
 - Beginning February 15, 2016, all Water Quality Parameters must be tested at least once at all locations where routine Lead/Copper samples are collected. Additionally, the 25 sites with the highest lead results will be tested 30 days later (within the same monitoring period).

- Must update the City of Jackson Water System Lead/Copper Site Plan. The plan must be designed and monitored by an engineer and provided to the MSDH Bureau of Public Water Supply. The plan must include a map with all sampling locations, intakes, wells, treatment plants, storage tanks, and booster stations. The plan and the map must be submitted to the Director of the MSDH Bureau of Public Water Supply on or before March 15, 2016.
- Until such time as a completed plan for the optimization of water treatment for the City of Jackson can be developed and reviewed by the MSDH Bureau of Public Water Supply, must ensure functional treatment of water in the current system to maintain a constant pH of at least 8.5 and alkalinity between 50 mg/l and 70 mg/L. Repairs or modifications to the City of Jackson Water System to establish these values must be completed as soon as feasible but no later than October 1, 2016.
- Must ensure that the Monthly Operational Report (MOR) is updated to include a daily average, maximum, and minimum values for alkalinity, pH, and hardness for entry points.
- In coordination with the MSDH Bureau of Public Water Supply, will develop and implement a special WQP sampling plan for distribution of water in the City of Jackson Water System.
- Must submit a written summary of activities related to all areas identified in this Compliance Plan to the Director of the MSDH Bureau of Public Water Supply by the 15th of each month, beginning March 15, 2016.

Any changes to this plan must be approved in writing, by the Director of the MSDH Bureau of Public Water Supply.

Department of Health says Jackson is in violation of safe drinking water requirements

Justin Vicory, Mississippi Clarion Ledger

Published 5:19 p.m. CT July 18, 2018 Updated 3:13 p.m. CT July 19, 2018



Joints that run approximately every 20 feet along a large portion of Jackson's water system include lead. Clarion-Ledger reporter Anna Wolfe reached out to city officials for an explanation. Anna Wolfe/The Clarion-Ledger



(Photo: Justin Vicory/Clarion-Ledger)

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The state Department of Health says the city of Jackson is in violation of safe drinking water standards.

But city officials said at a Wednesday news conference that the Jackson water supply is safe to drink and the violation does not constitute an

Share your feedback to help improve our site experience!

MORE STORIES



#MSLeg: Dealers of heroin, fentanyl could face life

Feb. 4, 2019, 9 a.m.



\$1 million cocaine bust in Rankin County

Feb. 4, 2019, 8:44 a.m.



'Financial infidelity' rising, survey finds

Feb. 2, 2019, 7 a.m.



Hughes skips campaign finance reform requirement

Feb. 1, 2019, 4:16 p.m.

Common Solutions

- Lead service line replacement
- Corrosion control via chemical additives (usually an orthophosphates blend, such as zinc orthophosphates; Flint also uses phosphoric acid)
- Daily testing at treatment plant; EPA-mandated site testing every three years
- Public education campaigns

Distinctive Solutions

Tallahassee, FL

➤ "We do a lot of testing throughout the city, our distribution system, and out wells. We go above and beyond what's required by rule."

– Jennifer Porter, Tallahassee Water Quality Program Engineer

➤ Pediatricians advocating for protective policies such as:

- Installing point-of-use NSF/ ANSI 53-certified lead removal water filters on drinking water sources used by young children
- Assessing pregnant women for lead exposure using a risk assessment questionnaire at the initial prenatal visit, blood lead testing for women identified as being at risk for lead exposure
- Public support for universal blood lead level testing for children ages 1 and 2 using point-of-care technologies and capillary ("finger-stick") blood
- Recommended limit of 1 ppb lead in water as public health standard, particularly in schools, rather than the widely-used US EPA action level of 15 ppb

Distinctive Solutions

Columbia, SC

- City's certified laboratory performs more than 200,000 analyses each year to insure that the water the City supplies to its customers meets all EPA and South Carolina Department of Health and Environmental Control standards at all stages of the treatment process and at hundreds of points throughout the City's distribution system.
- Free testing of tap water for households

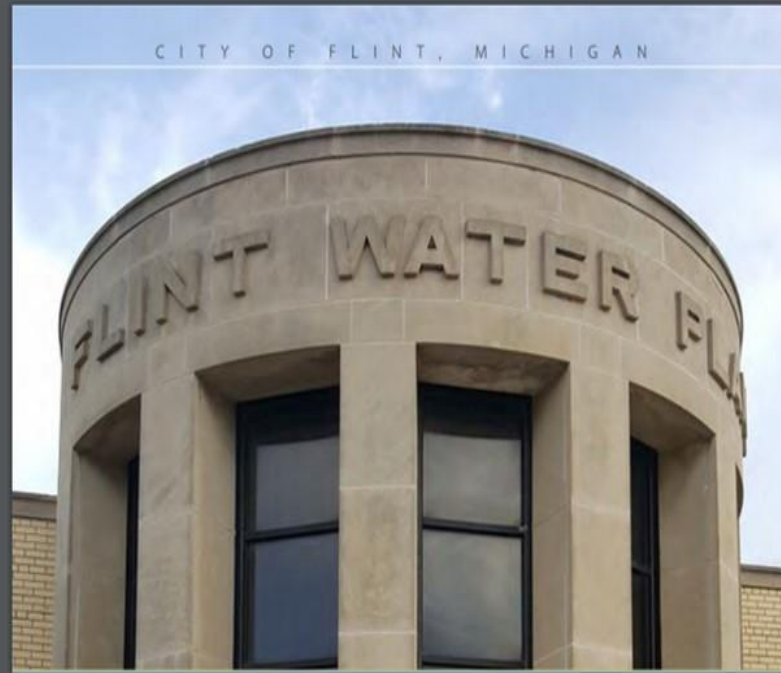
Baton Rouge, LA

- Act 632 of the 2018 Regular Session the Louisiana State Legislature mandates testing elementary schools built before 1986 for lead contamination of drinking water

Distinctive Solutions

Flint, MI

- All new water treatment plant (cost of \$108m over 4 years {2017-2020})
- FAST (Fast Action and Sustainability Team) Start lead pipe replacement program
- FAST Start is organized in Six Phases running through 2019.



Flint Water Treatment Plant Improvements Plan

January 30, 2017



FINAL REPORT

**CDM
Smith**

Section 1 - Executive Summary

1.1 Summary of Alternatives and Recommended Improvements

The total estimated capital cost of the recommended improvements to the Flint WTP is \$108 million. This estimate is based on the assumption that the plant residual solids are discharged to the City's sewer system. The estimated capital cost by work category is presented in **Table 1.1**. The alternatives considered and the specific recommended improvement within each work category are described following the table.

Table 1.1 - Recommended Improvements by Category

	Category	Estimated Cost
1	Demolish WTP No. 1	\$5,800,000
2	Raw Water Storage	\$37,000,000
3	Raw Water Pump Station	\$6,400,000
4	Transfer Pump Station and Filtered Water Control Structure	\$7,400,000
5	High Service and Backwash Pump Station	\$10,400,000
6	Pre-oxidation with Ozone	\$900,000
7	Rapid Mix Basins	\$900,000
8	Flocculation Basins	\$1,300,000
9	Inclined Plate Settler Basins (Sedimentation)	\$3,000,000
10	Granular Media Filters	\$1,600,000
11	Management of Used Filter Washwater - Equalization Basin and Pump Station	\$4,000,000
12	Disinfection and Dorr Reservoir Rehabilitation	\$2,000,000
13	Chemical Storage and Feed Systems	\$7,000,000
14	Improvements Identified by Condition Assessments	\$15,200,000
15	Other Ancillary Improvements	\$4,800,000
Total (Rounded)		\$108,000,000

- (1) Design dosages are based on Alum, 49% by weight
 (2) Minimum: minimum flow at minimum dose
 Average: average flow at average dose
 Maximum: maximum flow at maximum dose
 (3) Or other industry standard materials of construction

5.2.2 Corrosion Inhibitor System

A corrosion inhibitor will be added to prevent lead and copper corrosion in the distribution system. The chemical to be utilized will likely be phosphoric acid or a ortho/polyphosphate blend. The actual type of corrosion inhibitor and doses to be utilized will be determined at the conclusion of the corrosion study and provided to CDM Smith by MDEQ. The corrosion inhibitor storage tank selected is 1,000 gallons in order to accept larger bulk deliveries of the corrosion inhibitor. If redundancy is desired, two bulk storage tanks may be provided.

Table 5.6 - Corrosion Inhibitor System Design Criteria

No.	Design Criteria	Unit	Values
1	Design Dose		
	Minimum	mg/L	0.5
	Average	mg/L	1.0
	Maximum	mg/L	1.5
2	Bulk Chemical Concentration	%	100
3	Feed System Requirements (1)		
	Minimum	gal/hr	0.08

Section 5 - Chemical System Improvements

No.	Design Criteria	Unit	Values
4	Average	gal/hr	0.43
	Maximum	gal/hr	1.09
	Storage Tank Facilities		
	Bulk Tank		
	Type	--	Vertical Cylindrical
	Construction Material	--	High-Density Crosslinked Polyethylene (XLPE)
	Number of Tanks	number	1
	Diameter	ft	5.0
	Height	ft	9.0
	Storage Capacity	gal	1,000
	Days of Storage (average dose and flow)	days	97
	Day Tank		
	Type	--	Vertical Cylindrical
	Construction Material	--	High-Density Crosslinked Polyethylene (XLPE)
	Number of Tanks	number	1
	Diameter	ft	3.0
5	Height	ft	3.0
	Storage Capacity	gal	30
	Hours of Storage (average dose and flow)	hrs	27
	Metering Pumps		
	Metering Pumps		
	Type	--	Peristaltic or Hydraulically

- Phase I began March 2016 – high risk households in Flint given the first priority for pipeline removal and replacement. (High risk households: children under age 6, children with elevated blood lead levels, pregnant women, senior citizens, residential day care facilities, persons with compromised immune systems, households where water tests indicate high levels of lead at the tap)
- Phase V began in May 2018.
- Number of lead or galvanized steel pipes that need to be replaced in Flint is unknown; current estimate is approximately 12,000.
- Initially expected 15,000 homes had lead or galvanized steel service lines that need to be replaced; study by the University of Michigan found as many as 29,100 Flint residences are in need

Source: City of Flint FAST Start Pipe Replacement Program – <https://www.cityofflint.com/fast-start/>

➤Funding sources:

- 1) Phases 1-3 funded with State of Michigan funds appropriated in the 2017 State of Michigan budget (approved June 2016): **\$25 million**
- 2) Federal Water Infrastructure Improvement for the Nation (WIIN) Act of 2016, passed in March of 2017: **\$100 million** (approximate)
- 3) Settlement from *Concerned Pastors for Social Action v. Khouri* case (finalized in April of 2017): **\$47 million** (approximate).

➤As of April 18, 2018, the total number of lines replaced is 6,264 and the total number of full copper lines identified is approximately 2,500 since FAST Start launched in March 2016.

Recommendations for Jackson, MS

- Federal assistance needed:
 - Public Law No: 114-322 (12/16/2016) Water Infrastructure Improvements for the Nation Act)
 - Securing Required Funding for Water Infrastructure Now Act
- Widen MSDH education campaign and increase awareness (especially amongst policy- makers)
- Address immediate need for comprehensive compliance plan, and privatized aspects of water treatment
- More frequent site testing and reporting than every 3 years as mandated by EPA
- Free pre-emptive blood testing for lead exposure/poisoning (“proactive” approach rather than “reaction” to poisoning)
- Infrastructure/CDBG plan needed to address both lead paint and water exposure risks
- Require testing and remediation for lead in water at child care facilities.

Conclusion

➤ Future research implications

➤ Issues

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