

Flint resident sampling: August 2015 vs. March 2016

Kelsey Pieper and Marc Edwards
Virginia Tech



Flint residents

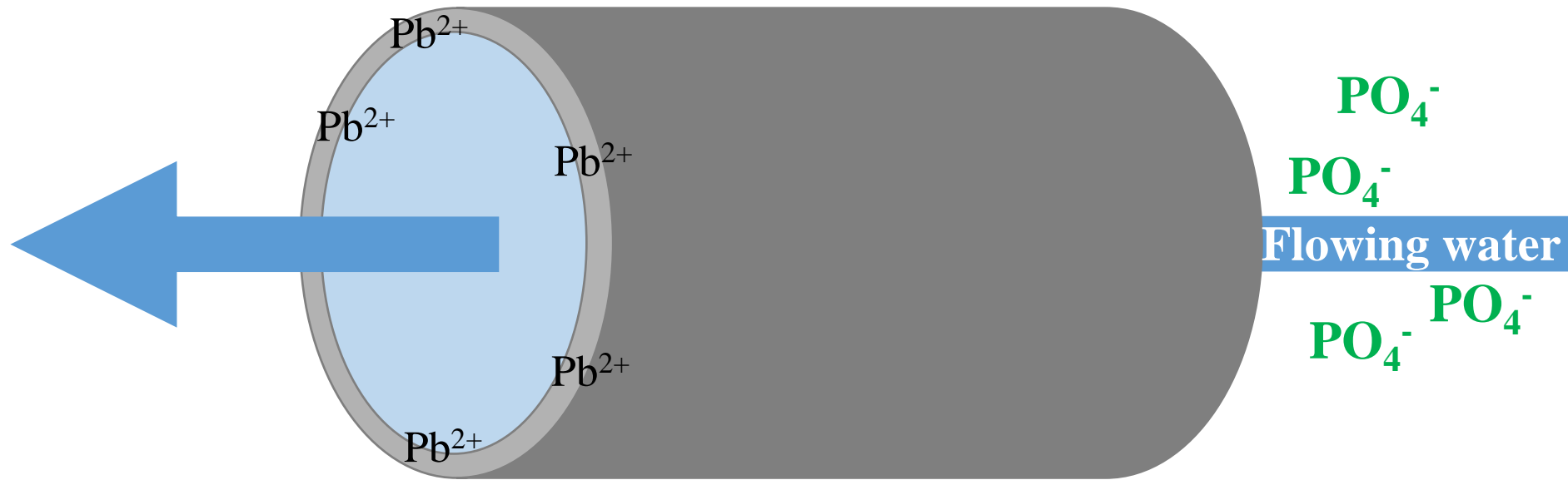


Dennis Walters, Matt Smith, Tracy Hacker, Tonya Williams, Kaylie Mosteller, Carrie Nelson, Claire McClinton, Keri Webber, Tony Palladeno Jr., Leah Palladeno, Jessica Owens

Formation of scale within the distribution system

Lead-bearing
plumbing materials

Corrosion control
chemicals



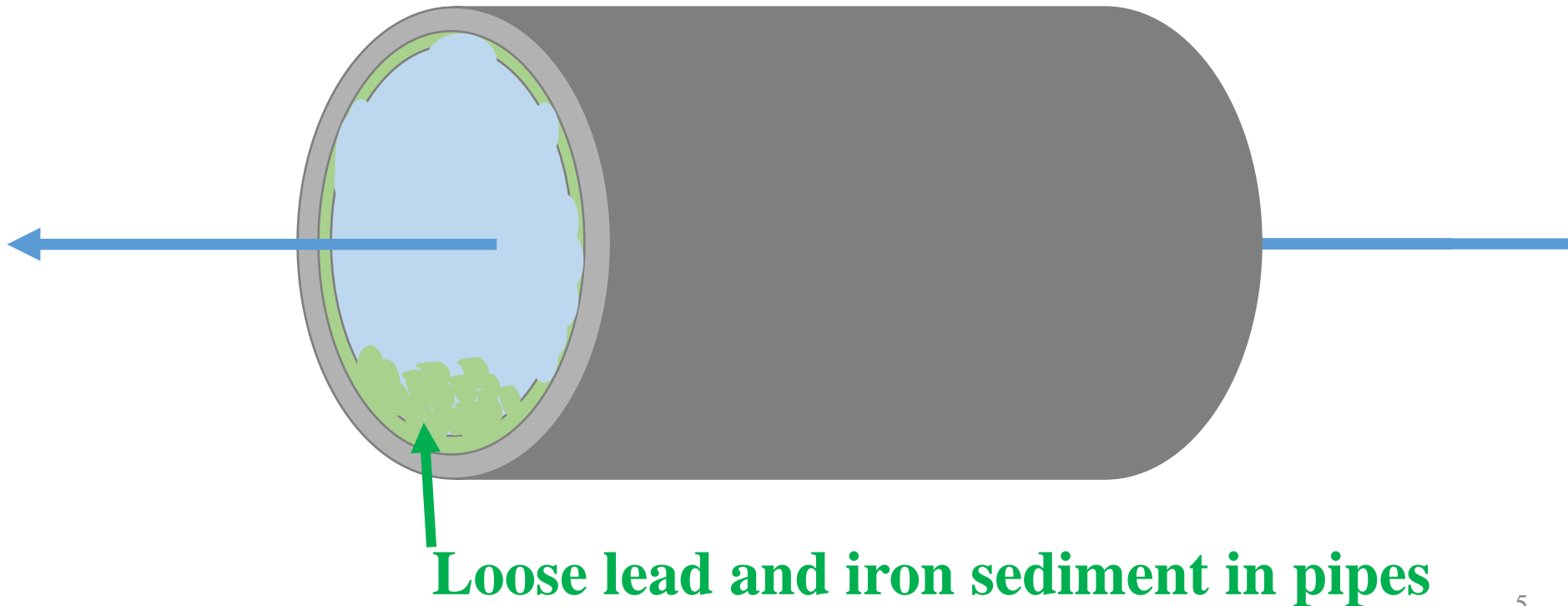
Formation of scale within the distribution system

Formation of protective scale layer: requires flowing water



Water from Flint River disrupted developed scales and biofilms

Flushing at low flow will clean lead deposits very slowly: Maybe months to years



Water from Flint River disrupted developed scales and biofilms

Flush pipes clean:

Remove lead and iron deposits in weeks



Promote biofilm (bacteria) control

Chlorine disinfection can treat water

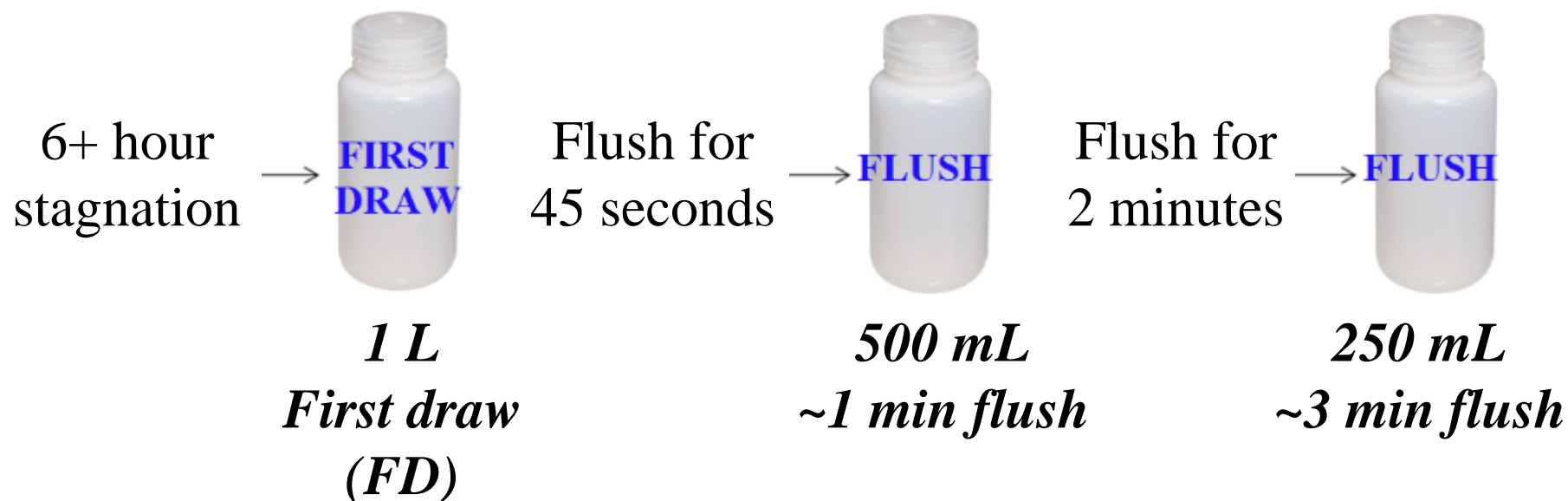


Comparing water quality in August 2015 vs. March 2016

To assess improvements since switch
back to Detroit water and implementation
of improved corrosion control

Sampling protocol

Collected water samples from a cold water tap that is **used for drinking water**



Homeowner sampling in Flint

August 2015: 269 homes sampled

- Participation rate: 90%

March 2016: 187 homes sampled

- Participation rate: 70%

***174 homes participating
in both 2015 and 2016
used for analysis***

174 households participated in both 2015 and 2016

	Non detects	Average	Median	90th	Max	% >AL
<i>2015</i>						
FD	10%	12.2	4.4	29.0	158	19%
1 min	37%	11.1	2.2	11.9	1,051	6%
3 min	49%	3.8	1.0	7.6	95	3%
<i>2016</i>						
FD	38%	32.3	1.8	23.0	2,253	15%
1 min	58%	3.6	0.5	9.0	81	5%
3 min	71%	1.9	0.5	3.4	69	2%

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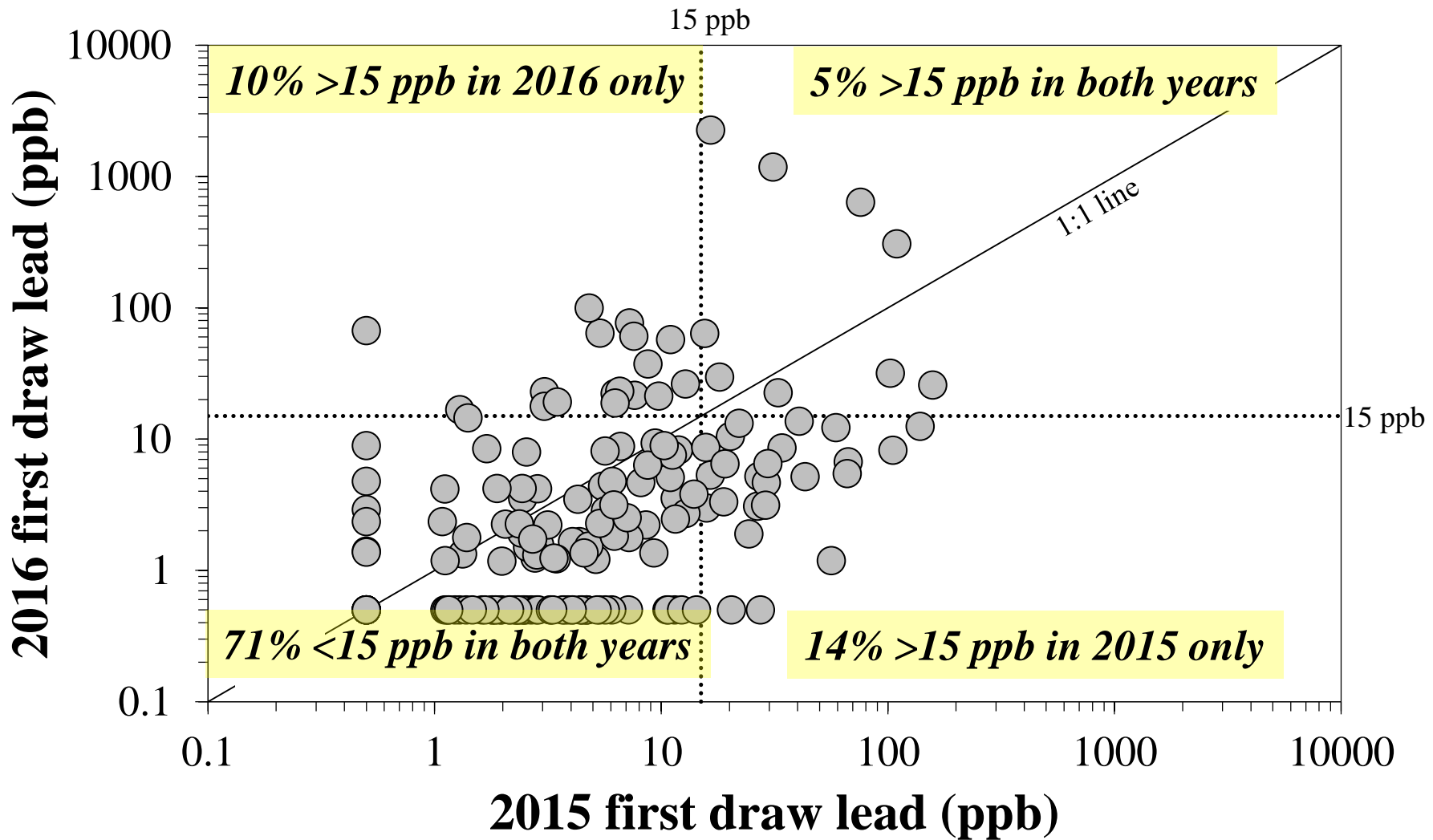
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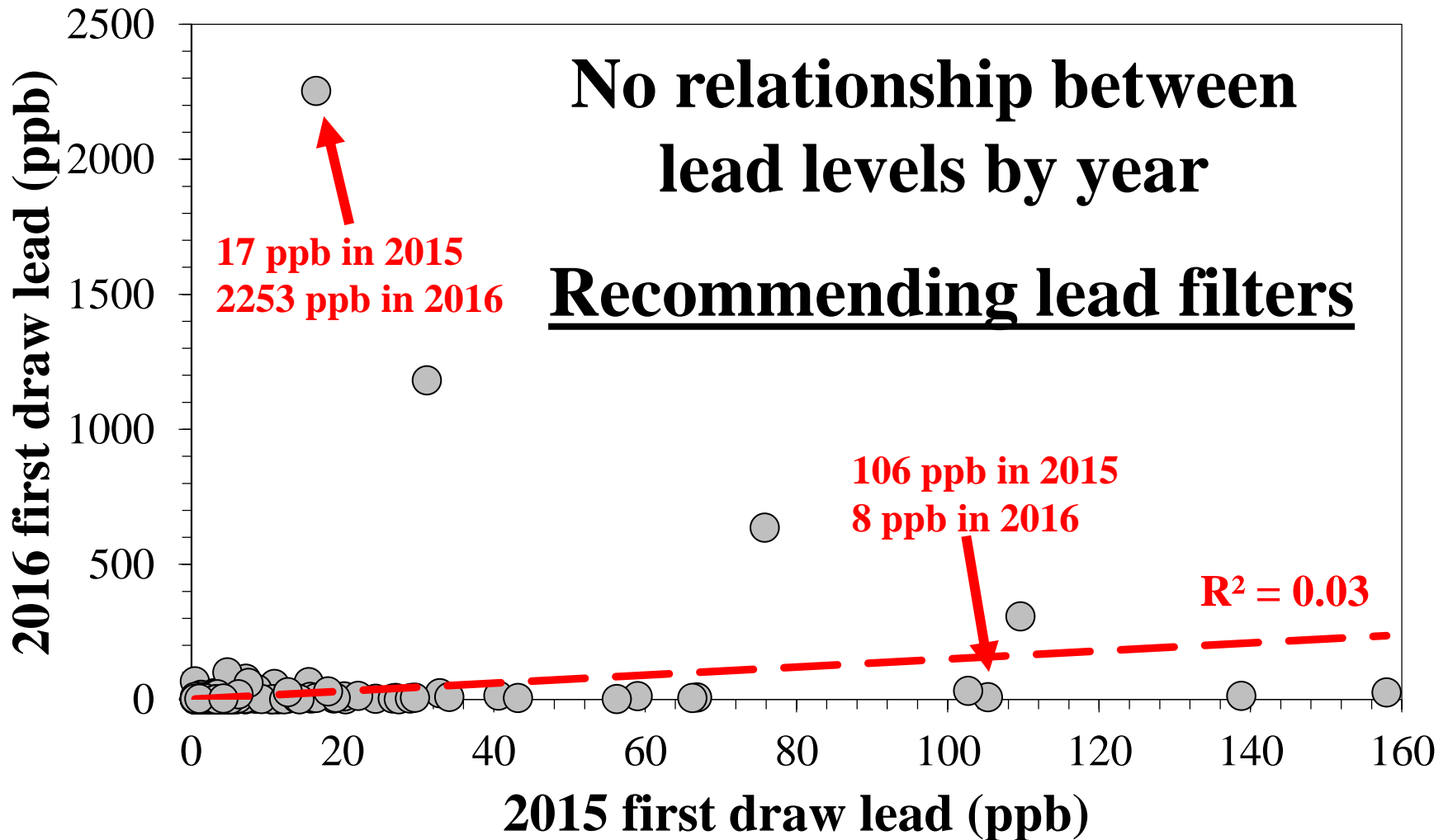
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2015 vs. 2016 first draws



2015 vs. 2016 first draws



Iron in water concentrations

	Average	Median	90th	Max	%>SMCL
<i>2015</i>					
FD	305.6	125.7	349.4	9,195	13%
1 min	162.5	111.2	285.4	2,323	9%
3 min	148.5	119.5	247.8	1,627	7%
<i>2016</i>					
FD	292.7	53.7	418.4	13,820	14%
1 min	92.9	36.3	157.2	1,471	5%
3 min	83.0	40.5	160.6	1,572	4%

Iron in water concentrations

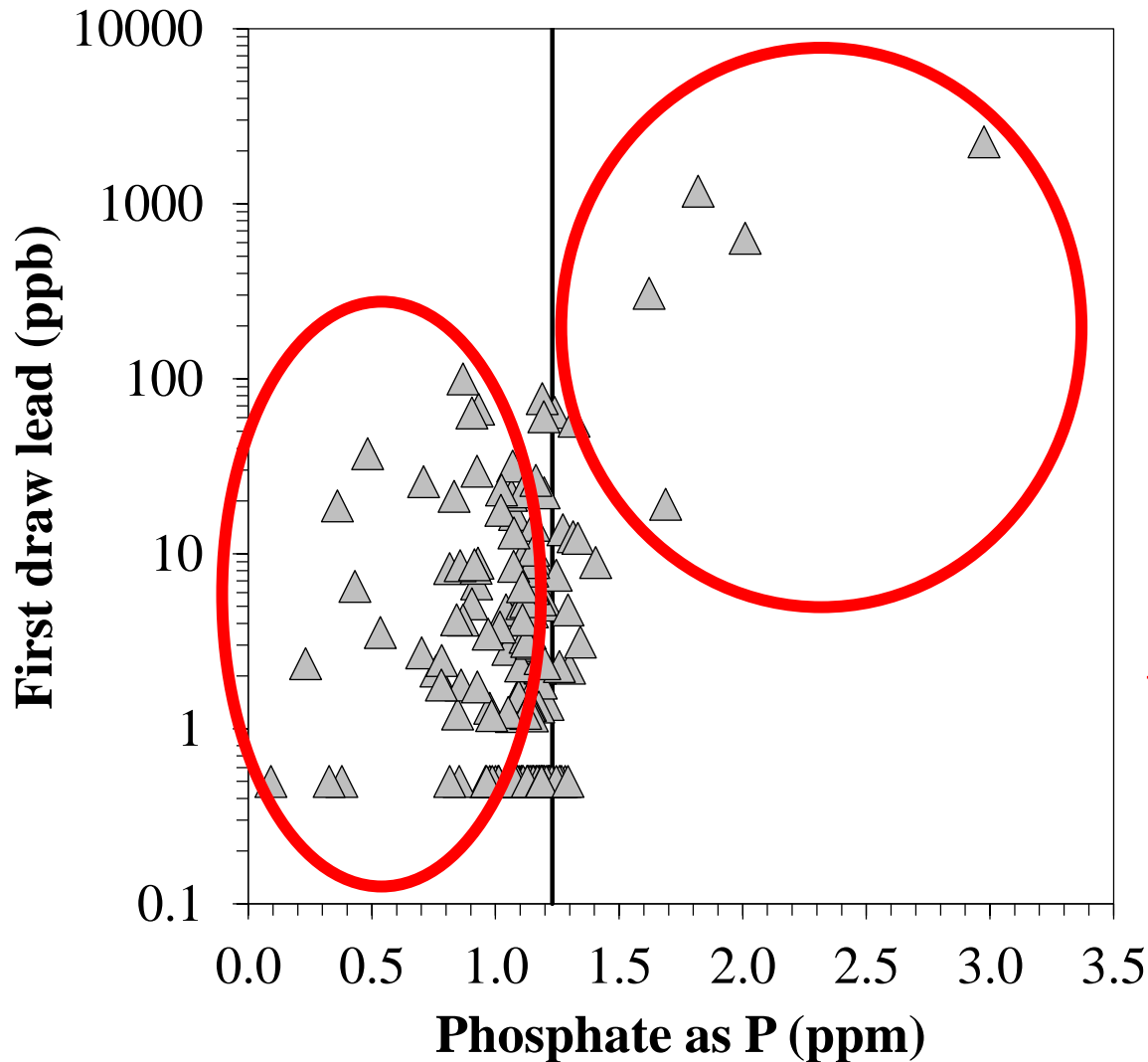
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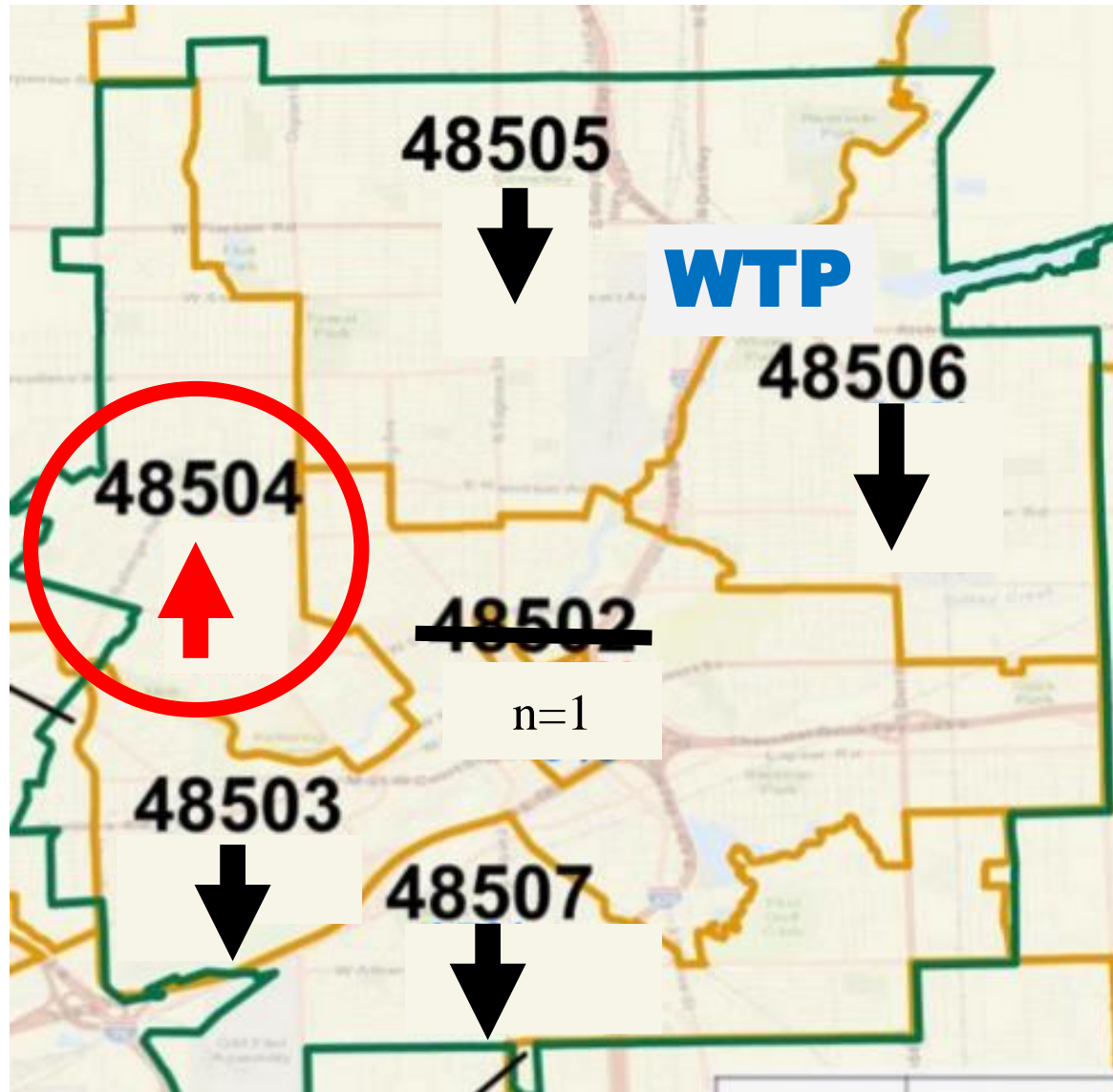
Phosphate levels in 2016



*Detachment of
leaded scale*

*Inadequate levels of
corrosion control
chemicals*

Change in lead levels by zip code



Many Flint residents are using very little water

Two homes with persistent elevated lead problem only using **20-45% of typical monthly volume**

1. Trying to reduce water bills
2. Showering only once per week (<5 min) to reduce the likelihood of rashes or exposure
3. Using bottled water for baths, washing dishes and other uses

Conclusions

1. Flint is not yet meeting the 90%ile lead action level
2. Lead levels are lower than in August 2015
3. Iron levels (and red water complaints) are decreasing
4. To speed up recovery of the system, residents will need to use more water

Virginia Tech Research Team

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Thank you!



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