

## EMAILS AND TESTIMONY AND OTHER INFORMATION CITED

**Note: The following emails were obtained by FOIA in a pdf format. A few of these were converted into a WORD format by a software program, which occasionally introduces some spelling and slight formatting errors.**

### TRIAL TESTIMONY

Dr. Zervos Testimony Recalling of MAY Meeting with Lyon

Q How was the relationship, the working relationship, as it related to you trying to get the scope of your information of whether or not the water source in the switch was the cause of the outbreak? How was it working with the State at that time?

A I would say it was not working well or as we would have liked it to work.

Q And, did there come a point in time where you had a meeting with Mr. Lyon where you were with your team, Doctor Kilgore and Doctor Shawn McElmurry?

A Yes, I did. We had a, we argued for some period of time over the scope of the study, what we would look at, what we were not allowed to look at and actually had significant disagreements and that culminated over a several month period with the meeting with Mr. Lyon where we expressed to him the urgency to get the, this project started and that if we didn't get it started that there were going to be people that were going to lose their lives over, over (sic) this.

### McElmurry Testimony Recollection of Lyons May Meeting

9 A So Doctor Kilgore told him that it was in the discussion about  
10 whether or not there would be continued enhanced surveillance  
11 and Doctor Kilgore impressed upon him that the decisions Nick  
12 was making or not making could cause people to die.

13 Q So that's what I was asking earlier.

14 A I'm sorry.

15 Q There was instruction or a statement you were all trying to  
16 get across to Mr. Lyon?

17 A Yes, sir.

18 Q Yes?

19 A Yes.

20 Q That was to, you don't do X, you don't do whatever, people are  
21 going to die.

22 A Yes.

23 Q Is that what you just said?

24 A Yes.

#### Illustrative Kilgore Testimony on Meeting With Lyon

BY MR. CHAMBERLAIN:

A We had at that point in the early May we really didn't have any  
project yet.

Q And, in your effort to be persuasive you became angry with him,  
correct?

A I wouldn't use the word angry. I would say vocal in the sense that  
when people are communicating the direness of the situation, the  
gravity of the situation, in order to communicate that gravity one of  
the things that is often done is actually emphasizing a point and  
that's what we were doing.

Q Yeah, and you pounded on the table and you were profane with him. You  
in fact were unprofessional, correct?

A I don't recall.

Q You don't recall whether you were unprofessional with the Director of  
a State agency for whom you were seeking millions of dollars?

A What I do recall is that we had a discussion and what I communicated  
to Mr. Lyon is that we knew based on the trajectory of 2014, 2015  
epidemics that there's a chance that if nothing else were done in  
2016 there could be additional cases and that we already know that,

you know, if you look at Legionnaires Disease cases across the country and world at least ten percent of cases will die and so I tried to underscore the point that if we don't try to address this problem urgently that there will be additional deaths.

Farah Hanley account of meeting.

<https://nbc25news.com/news/local/researcher-in-2015-people-will-f-ing-die-without-funding-for-legionnaires-study>

Hanley says Lyon and, along with many others in the department, were working very hard to make sure any funding approved for Flint would be distributed.

The purpose of the meeting was to discuss Wayne State University's request for approximately \$11 Million to conduct a thorough investigation into the deadly legionnaires outbreak in in 2014 and 2015.

The meeting was attended by Dr. Paul Kilgore, two other researchers from the university, Nick Lyon, and Hanley. Hanley says the conversation over funding the research project reached a boiling point.

"Dr. Kilgore turned red and pounded his hand on the table and said, "People are going to F-ing die" if the research didn't happen. It shocked me. I had never seen him like that before. I even moved closer to Nick because I was afraid he might come after the director," Hanley says.

**Subject:** RE: Latest from FWICC

**Date:** Mon, 15 Aug 2016 15:00:07 +0000

**From:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>

**To:** Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>, Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>

**CC:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>, Matthew Wayne Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>, Laura Sullivan <[lsulliva@kettering.edu](mailto:lsulliva@kettering.edu)>, Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>

I'm prepared to try and incorporate as much of this into the NIH project as possible as well. More soon.

**From:** Nancy Love [<mailto:nglove@umich.edu>]

**Sent:** Monday, August 15, 2016 10:03 AM

**To:** Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>

**Cc:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Wayne Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Laura Sullivan <[lsulliva@kettering.edu](mailto:lsulliva@kettering.edu)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>

**Subject:** Re: Latest from FWICC

We need to move forward and if state changes their mind now after having known the filters were part of the study for many months, then I will be prepared to state what happened publicly. I have been asked dozens of times for interviews about Flint and have turned them all down until i had data to discuss. I will be ready to give interviews if we are not supported by the state to do the scientifically appropriate work we are trying to do.

Nancy

RE: Latest  
from FWICC

**Date:** Mon, 15 Aug 2016 15:00:07 +0000

**From:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>

**To:** Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>, Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>

**CC:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>, Matthew Wayne Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>, Laura Sullivan <[lsulliva@kettering.edu](mailto:lsulliva@kettering.edu)>, Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>

I'm prepared to try and incorporate as much of this into the NIH project as possible as well. More soon.

Subject: RE: Latest from FWICC

Date: Fri, 12 Aug 2016 14:16:14 +0000

From: Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>

To: Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>, Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>, Matthew Wayne Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>, Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>, Laura Sullivan <[lsulliva@kettering.edu](mailto:lsulliva@kettering.edu)>, Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>

Marc Edwards also gave presentation saying legionella detected in residential households was low.

-----Original Message-----

From: Prof. Susan Masten [<mailto:masten@egr.msu.edu>]

Sent: Friday, August 12, 2016 9:54 AM

To: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Paul Evan Kilgore <paul.kilgore@wayne.edu>; Matthew Wayne Seeger <matthew.seeger@wayne.edu>; Marcus Zervos <MZERVOS1@hfhs.org>; Laura Sullivan <lsulliva@kettering.edu>; Nancy Love <nglove@umich.edu>

Subject: Re: Latest from FWICC

I think you're right about pulling out of Flint.

<http://www.freep.com/story/news/local/michigan/flint-water-crisis/2016/08/11/expert-flint-beginning-end-lead-disaster/88566086/> ----- Forwarded Message -----

Subject: RE: Latest from FWICC

Date: Fri, 12 Aug 2016 14:16:11 +0000

From: Zervos, Marcus [MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)

To: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>

CC: Paul Evan Kilgore <paul.kilgore@wayne.edu>, Matthew Wayne Seeger <matthew.seeger@wayne.edu>, Laura Sullivan <lsulliva@kettering.edu>, Nancy Love <nglove@umich.edu>, Susan Masten <masten@egr.msu.edu>

Ill set it up

From: Shawn Patrick McElmurry [mailto:s.mcelmurry@wayne.edu]

Sent: Friday, August 12, 2016 10:12 AM

To: Zervos, Marcus <MZERVOS1@hfhs.org>

Cc: Paul Evan Kilgore <paul.kilgore@wayne.edu>; Matthew Wayne Seeger <matthew.seeger@wayne.edu>; Laura Sullivan <lsulliva@kettering.edu>; Nancy Love <nglove@umich.edu>; Susan Masten <masten@egr.msu.edu>

Subject: RE: Latest from FWICC

I want to speak with him.

From: Zervos, Marcus [<mailto:MZERVOS1@hfhs.org>]

Sent: Friday, August 12, 2016 10:09 AM

To: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>

Cc: Paul Evan Kilgore <paul.kilgore@wayne.edu>; Matthew Wayne Seeger <matthew.seeger@wayne.edu>; Laura Sullivan <lsulliva@kettering.edu>; Nancy Love <nglove@umich.edu>; Susan Masten <masten@egr.msu.edu>

Subject: RE: Latest from FWICC

Am setting up call for Monday, even better how about we talk to the Jim Marleau ( I made his acquaintance) he wants to speak with us

From: Shawn Patrick McElmurry [mailto:s.mcelmurry@wayne.edu]

Sent: Friday, August 12, 2016 10:04 AM

To: Zervos, Marcus <MZERVOS1@hfhs.org>

Cc: Paul Evan Kilgore <paul.kilgore@wayne.edu>; Matthew Wayne Seeger <matthew.seeger@wayne.edu>; Laura Sullivan <lsulliva@kettering.edu>; Nancy Love <nglove@umich.edu>; Susan Masten <masten@egr.msu.edu>

Subject: RE: Latest from FWICC

We need to meet with Chair of GCHD Board ASAP.

I am fine with working outside of health department, their conflict of interest is even worse than the State...it will just be extremely difficult for some aspects of the project.

From: Zervos, Marcus [mailto:MZERVOS1@hfhs.org]

Sent: Friday, August 12, 2016 10:01 AM

To: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Paul Evan Kilgore <paul.kilgore@wayne.edu>; Matthew Wayne Seeger <matthew.seeger@wayne.edu>; Laura Sullivan <lsulliva@kettering.edu>; Nancy Love <nglove@umich.edu>; Susan Masten <masten@egr.msu.edu>

Subject: RE: Latest from FWICC

I think we should look at potential of working totally independently from the health departments

On Monday, August 15, 2016, Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)> wrote:  
im speechless

Sent from my iPhone

On Aug 15, 2016, at 9:41 AM, Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)> wrote:

I wanted to provide a quick follow up to my Friday email sent from FWICC. Before leaving FWICC Gov. Snyder shook my hand and asked how our work was going. My response was that it wasn't...and that he needed to push if he wanted this done. He looked shocked and did not respond with anything more than ok. After the FWICC I had a long discussion with Nick Lyons, Keith Creagh, Eden Wells, George Krisztian, Bryce Feighner. Mike McDaniel, Nick Anderson, and another DEQ employee were present but did not talk. I was directed by Nick to explain all the samples I was collecting, particularly the filter sample, to Keith Creagh, who looked very skeptical. He asked a lot of questions about why we would collect filters, what did we expect to find, etc. Keith and Nick were both questioning scientific value of study. Nick said to me he has to balance the value of finding information and upsetting the public. After our meeting, Nick also said the people at EPA do not think we should do it. After probably 20 minutes, Keith said if George and Bryce were comfortable, then we should do it.

Friday evening, I talked with Bryce again. He confirmed they (MDEQ and state in general) is just very worried we might "find something". I discussed the sampling more with Bryce so he understood what we were doing. He said he would talk with Keith over the weekend and that in the past<sub>6</sub>, Keith has followed his lead. He made

it sound like he would advocate for our position.

Then, in a chance encounter, I ran into Sarah Lyon-Callo while waiting to meet with Susan and Nancy in East Lansing at 7pm. I asked Sarah what was going on and she seemed to be completely in the dark of all of this. I believed her. She said as far as she was concerned we were done talking and the contract was signed. She did not express any reservations but she did indicate that Nick was very nervous, particularly given the atmosphere in the state - I took this to be regarding the charges brought against MDHHS staff. Based on this conversation, I believe the problem we have here is purely political.

Finally, I had another conversation over the weekend that I wanted to share. Paul and I were contacted by Vicki Van Buren. The family of the 3<sup>rd</sup> Legionella case feels as though MDHHS and GCHD are trying to "cover up" the case. She said the family would like to talk to us and have our assistance. I explained to Vicki our predicament regarding our state IRB and funding, and based on the data use agreement we could not initiate contact with the family. I also explained that we have offered GCHD our services multiple times and Suzanne has said no every time. I encouraged Vicki to work with MDHHS and GCHD to help complete a full investigation.

So, lots of things going here...not sure where they are going. We really are running out of time. With summer nearly complete, I will be losing 2 individuals from my lab that I had planned to work on this over the summer and the other students will only be able to work 20 hrs/week, rather than the 40 hrs/week possible during summer. Worse, my lab is being renovated Sept. 15-Oct. 5 while I will be in Australia. I can't tell you how furious I am with the state, they have completely screwed us and the people of Flint.....enough of my complaining. Today, I plan to revise the IRB consent for the epi portion of the study with Paul's help. I will also send an email to Nick Lyon's stating we need a yes or no answer on doing this. We cannot wait any longer.

Sorry for the long email. Just wanted all of you to know what was going on.

Shawn

**From:** Shawn Patrick McElmurry  
**Sent:** Friday, August 12, 2016 9:42 AM  
**To:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Wayne Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; 'Laura Sullivan' <[lsulliva@kettering.edu](mailto:lsulliva@kettering.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>; Susan J. Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)> <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>  
**Subject:** Latest from FWICC

Quick notes from before FWICC:

Eden warned me that the state does not want me to sample filters. I told her this has a major impact on the science but she indicated that this may be a red line.

In a conversation with Bryce, I brought this up. He indicated that Keith Creigh was particularly concerned about this. He also said the state does not want to find DNA in the water, dead or alive. I told him the purpose of the sampling was to understand how much is in the water and that finding DNA on the filters would show the filters are working. He indicated he understood this and personally would like to have this information but that communicating this was the real

issue.

I'm in FWICC now and going to talk with Nick Lyons, Keith Creigh, and others to push back on this. I'm seriously concerned they have no interest in understanding this better but rather they are interested in just pulling out of Flint.

Shawn P. McElmurry, Ph.D., P.E.  
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Wayne State University  
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## FACHEPS LOW CHLORINE FIASCO

**Subject:** RE: Updated draft press release for water testing in homes of Flint  
**Date:** Mon, 17 Oct 2016 01:45:36 +0000  
**From:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**To:** Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>  
**CC:** Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>, Laura Sullivan (<[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)> <[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)>), Benjamin Pauli <[bpauli@kettering.edu](mailto:bpauli@kettering.edu)>, Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>, Joanne Sobeck <[ab1350@wayne.edu](mailto:ab1350@wayne.edu)>, Nancy Love<[nglove@umich.edu](mailto:nglove@umich.edu)>, Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>

After reviewing the literature, I had to revise the AWWA recommendation. Please use attached version. Also, I modified the titled to include "Preliminary results" because I feel like the previous version was too definitive.

Also, Should we mention something about the needs assessment? I think this might be good but I don't know that we have any preliminary results. Joanne has been copied...maybe she can weigh in.

I've also copied Nancy and Susan on this. Nancy and Susan, your comments and suggestions are welcome.

Shawn

Flint Area Community Health Environment Partnership finds Legionella bacteria in small percentage of homes tested

~~ANN ARBOR~~—DETROIT- The Flint Area Community Health Environment Partnership (FACHEP), led by professors from Wayne State University and Kettering University, completed initial testing of residential water this week. FACHEP is working to understand ~~the how-to-prevalence of~~ Legionella bacteria ~~aires disease~~ within drinking water systems and identify conditions that reduce the risk of exposure to this bacterium. As of last Friday, October 14<sup>th</sup>, FACHEP detected Legionella in ~~seven~~ 7 Flint homes. Previous studies ~~on~~ other water systems have ~~reported finding~~ found Legionella bacteria in 5 ~~to~~ -30% of homes. Since August 2016, FACHEP has sampled water from 78 Flint homes.

Dr. Shawn McElmurry, ~~A~~ssociate ~~P~~rofessor of ~~C~~ivil and ~~E~~nvironmental ~~E~~ngineering at Wayne State University noted that these results are not necessarily outside what would be expected in other residential water systems. Some of the Legionella levels, however, were quite high. "We also found chlorine levels entering ~~the water systems of~~ 24% of the homes to be 0.2 mg/L. The American Water Works Association ~~AWWA~~ recommends maintaining a residual chlorine level ~~above 0.5~~ between 0.2 mg/L and 2.0 mg/L at all times."

All water contains bacteria and chlorine is the primary chemical used to ~~treat the~~ disinfect drinking water. The damage to the Flint water system has made it more difficult to maintain proper chlorination levels. It is not clear if the presence of Legionella bacteria is ~~associated with~~ more common in some parts of the ~~the~~ Flint waters system than with others. "We are looking at that possibility," said McElmurry.

Dr. Paul Kilgore, ~~A~~ssociate ~~P~~rofessor in Eugene Applebaum College of Pharmacy and Health Sciences at Wayne State University, noted that there are many strains of Legionella bacteria. Some strains, like Legionella pneumophila serotype 1, are more commonly associated with ~~not all are associated with~~ human disease. The FACHEP team will be studying the strains found in Flint homes to better understand how these strains relate to the risk of Legionellosis. ~~... (Paul add more ....)~~

The FACHEP group has not matched any of the homes with Legionella bacteria to cases of Legionnaires' disease. The Genesee County Health Department has not shared any information regarding the current Legionellosis cases and FACHEP has not assisted in the environmental sampling of the homes of Flint residents who have contracted Legionnaires' disease.

The FACHEP team is conducting a systematic investigation measuring 20 parameters in the water that is collected from Flint homes. The team collects up to 23 samples that are analyzed at various laboratories to characterize water quality. Residents are notified if the results of the tests as soon as they are available. This is one of the most comprehensive studies of the Flint water system to date.

FACHEP is led by Wayne State researchers specializing in environmental engineering, public health and social and community support systems. The team also includes participants from Michigan State University, the University of Michigan, Colorado State University, Henry Ford Health System, The MADE Institute, and Genesee Health Systems. Funding for FACHEP's independent investigation was provided through a contract between the Michigan Department of Health and Human Services and Wayne State University.

Most healthy people do not get sick after being exposed to *Legionella*. Being 50 years or older or having certain risk factors increases the chances of getting sick. Other risk factors include being a current or former smoker; having chronic lung disease, such as emphysema or chronic obstructive pulmonary disease; having a weakened immune system from diseases like cancer, diabetes, or kidney failure; or taking medicine that weakens your immune system. Legionnaires' disease is not common in children.

Although people can get Legionnaires' disease at any time of year, it's more common in summer and fall when temperatures are warmer. ~~To date~~As of October 8 2016, 11 ~~three~~ cases of Legionnaires' disease have been ~~report~~identified in Genesee County since January 1, 2016. Large water systems, like those found in hospitals, hotels, and other large buildings, can sometimes grow *Legionella* bacteria, if they are not properly maintained. The most common sources of exposure from these types of buildings are air conditioning systems with cooling towers, hot tubs and spas, or decorative fountains.

FACHEP researchers wish to express their thanks to Flint Residents ~~en~~nets for their assistance with this investigation.

**Shawn McElmurry**

**From:** Shawn Patrick McElmurry  
**Sent:** Tuesday, October 18, 2016 2:42 PM  
**To:** Matthew Seeger  
**Subject:** FW: Release of preliminary results

DO NOT LET THE STATE WRITE OUR HEADLINE. Good response Matt.

**From:** Matthew Seeger  
**Sent:** Tuesday, October 18, 2016 2:30 PM  
**To:** Minicuci, Angela (DHHS) <MinicuciA@michigan.gov>  
**Cc:** Wells, Eden (DHHS) <WellsE3@michigan.gov>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Matthew T Lockwood <ei1888@wayne.edu>  
**Subject:** Re: Release on preliminary results

Hi Angela

Thanks for the email. I think that is unlikely that this will be sensationalized but I will try and get that up higher.

Thank you for the suggestion

Matt

Matthew W. Seeger, Ph.D.  
Professor and Dean  
College of Fine, Performing & Communication Arts  
5104 Gullen Mall- The Linsell House

Wayne State University  
Detroit, MI 48202  
Phone: (313) 577-5342  
FAX: (313) 577-5355  
Web: <http://www.cfpc.wayne.edu/>  
Please reply to: [Matthew.Seeger@wayne.edu](mailto:Matthew.Seeger@wayne.edu)

Sent from my iPhone

On Oct 18, 2016, at 2:21 PM, Minicuci, Angela (DHHS) <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)> wrote:

Hi Matt,

This needs to be included somehow in the headline or lead -- otherwise the media sensationalism will quickly overpower the facts:

"...results are not necessarily outside what would be expected in other residential water systems."

Thank you,

Angela

From: Matthew Seeger [<mailto:matthew.seeger@wayne.edu>]

Sent: Tuesday, October 18, 2016 6:58 AM

To: Minicuci, Angela (DHHS) <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)>; Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; Cupal, Suzanne <[scupal@gchd.us](mailto:scupal@gchd.us)>

Cc: Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Laura Sullivan <[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)> <[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)>; Joanne Sobeck <[ab1350@wayne.edu](mailto:ab1350@wayne.edu)>

Subject: Release on preliminary results

Hi Everyone,

Attaches is a release we have developed on the preliminary results from FACHEP. This has been through several rounds of edits and we believe its a very accurate representation of our current results. We anticipating releasing this tomorrow.

Please let me know if you have any questions or concerns.

Thanks,

Matt Seeger

<image001.png>

Matthew W. Seeger, Ph.D.  
Professor and Dean  
College of Fine, Performing & Communication Arts  
5104 Gullen Mall - The Linsell House

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Please reply to: [Matthew.Seeger@Wayne.edu](mailto:Matthew.Seeger@Wayne.edu)



**From:** Marc Edwards <[edwardsm@vt.edu](mailto:edwardsm@vt.edu)>  
**Sent:** Tuesday, October 18, 2016 9:29 AM  
**To:** 'Wells, Eden (DHHS)' <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>  
**Subject:** RE: Release on preliminary results

See attached. Marc

Preliminary results of Flint Area Community Health And Environment Partnership finds Legionella bacteria in small percentage of homes tested  
DETROIT- The Flint Area Community Health and Environment Partnership (FACHEP), led by professors from Wayne State University and Kettering University, completed initial testing of residential water this week. FACHEP is working to understand the prevalence of Legionella bacteria within drinking water systems and identify conditions that reduce the risk of exposure to this bacterium. As of last Friday, October 14<sup>th</sup>, FACHEP detected Legionella in seven Flint homes. Previous studies in other water systems have found Legionella bacteria in 5 to 30% of homes. Since August 2016, FACHEP has sampled water from 78 Flint homes. Dr. Shawn McElmurry, Associate Professor of Civil and Environmental Engineering at Wayne State University noted that these results are what would be expected in other systems "We also found chlorine levels entering approximately 20% of the homes to be 0.2 mg/L or less. The American Water Works Association recommends maintaining a residual chlorine level between 0.2 mg/L and 2.0 mg/L at all times." Should note that this is rarely achieved in practice. <http://www.paawwa.org/wp-content/uploads/2015/03/Aqua.pdf>  
All water contains bacteria, much of which is nonpathogenic. Chlorine is the primary chemical used to disinfect drinking water. The damage to the Flint water system has made it more difficult to maintain proper chlorination levels. It is not clear if the presence of Legionella bacteria is more common in some parts of the Flint water system than with others. "We are looking at that possibility," said McElmurry.  
Dr. Paul Kilgore, Associate Professor in Eugene Applebaum College of Pharmacy and Health Sciences at Wayne State University, noted that there are many strains of Legionella bacteria. Some strains, like Legionella pneumophila serotype 1, are more commonly associated with human disease. The FACHEP team will be studying the strains found in Flint homes to better understand how these strains relate to the risk of Legionellosis.  
FACHEP is coordinating efforts with the Michigan Department of Health and Human Services and Genesee County Health Department. FACHEP is investigating, but has yet to draw, connections between homes with Legionella bacteria to cases of Legionnaires disease. FACHEP has not assisted in the environmental sampling of

**Commented [ME1]:** Which type of Legionella? Is it pneumophila?  
Prior studies focused on L. pneumophila.

**Commented [ME2]:** This is misleading...it is rarely achieved in practice. And the issue is very much under discussion. See attached presentation.

**Commented [ME3]:** No. Unlined iron pipe makes it difficult. I don't think the damage makes it difficult.

**From:** Wells, Eden (DHHS) [<mailto:WellsE3@michigan.gov>]  
**Sent:** Tuesday, October 18, 2016 8:19 AM  
**To:** Marc Edwards <[edwardsm@vt.edu](mailto:edwardsm@vt.edu)>  
**Subject:** Fwd: Release on preliminary results

I would love your thoughts if you have a minute...

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

**From:** Matthew Seeger  
**Sent:** Tuesday, October 18, 2016 8:55 AM  
**To:** Shawn Patrick McElmurry  
**Subject:** Fwd: Release on preliminary results

This is your response.

Matthew W. Seeger, Ph.D.  
Professor and Dean  
College of Fine, Performing & Communication Arts  
5104 Gullen Mall- The Linsell House

Wayne State University  
Detroit, MI 48202  
Phone: (313) 577-5342  
FAX: (313) 577-5355  
Web: <http://www.cfpc.wayne.edu/>  
Please reply to: [Matthew.Seeger@wayne.edu](mailto:Matthew.Seeger@wayne.edu)

Sent from my iPhone

Begin forwarded message:

**From:** "Wells, Eden (DHHS)" <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>  
**Date:** October 18, 2016 at 8:48:14 AM EDT  
**To:** "Zervos, Marcus" <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>  
**Cc:** Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>, "Minicuci, Angela (DHHS)" <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)>, "Cupal, Suzanne" <[scupal@gchd.us](mailto:scupal@gchd.us)>, "Shawn Patrick McElmurry" <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>, Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>, "Laura Sullivan (dr.laura2@gmail.com)" <[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)>, Joanne Sobeck <[ab1350@wayne.edu](mailto:ab1350@wayne.edu)>  
**Subject:** Re: Release on preliminary results

I think it's pretty important that you all have as much clarity as possible regarding your findings. I would also like to see a split of what was on Flint and off Flint water – we advise you repeatedly that controls were needed. This appears again to be findings without context.

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

On Oct 18, 2016, at 8:22 AM, Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)> wrote:

Some of the other samples have suspect colonies that are still being worked up

**From:** Wells, Eden (DHHS) [<mailto:WellsE3@michigan.gov>]  
**Sent:** Tuesday, October 18, 2016 8:19 AM  
**To:** Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>  
**Cc:** Minicuci, Angela (DHHS) <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)>; Cupal, Suzanne <[scupal@gchd.us](mailto:scupal@gchd.us)>; Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Laura Sullivan (<[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)>) <[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)>; Joanne Sobeck <[ab1350@wayne.edu](mailto:ab1350@wayne.edu)>  
**Subject:** Re: Release on preliminary results

Just a brief scan here as I am multitasking but essentially your prevalence of 10% which is been found another studies, correct?

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

On Oct 18, 2016, at 6:59 AM, Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)> wrote:

Hi Everyone,

Attaches is a release we have developed on the preliminary results from FACHEP. This has been through several rounds of edits and we believe its a very accurate representation of our current results. We anticipating releasing this tomorrow.

Please let me know if you have any questions or concerns.

Thanks,

Matt Seeger

<2B5109AF-B2D2-4B3F-BB8F-9DE2992FA70E[5].png>

Matthew W. Seeger, Ph.D.  
Professor and Dean  
College of Fine, Performing & Communication Arts  
5104 Gullen Mall - The Linsell House

Wayne State University  
Detroit, MI 48202  
Phone: (313) 577-5342  
FAX: (313) 577-5355



**From:** [Wells, Eden \(DHHS\)](#)  
**To:** [Adler, Ari \(GOV\)](#)  
**Cc:** [Creagh, Keith \(DNR\)](#); [Lyon, Nick \(DHHS\)](#); [Baird, Richard \(GOV\)](#); [Heaton, Anna \(GOV\)](#); [Zimmer, Mike \(GOV\)](#)  
**Subject:** Re: Release on preliminary results  
**Date:** Tuesday, October 18, 2016 10:19:24 AM

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Forwarding

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

On Oct 18, 2016, at 10:00 AM, Adler, Ari (GOV) <[AdlerA@michigan.gov](mailto:AdlerA@michigan.gov)> wrote:

This needs to be included somehow in the headline or lead -- otherwise the media sensationalism will quickly overpower the facts.

--

“...results are not necessarily outside what would be expected in other residential water systems.”

--

---

**From:** Wells, Eden (DHHS)  
**Sent:** Tuesday, October 18, 2016 8:47 AM  
**To:** Creagh, Keith (DNR) <[creaghk@michigan.gov](mailto:creaghk@michigan.gov)>; Lyon, Nick (DHHS) <[LyonN2@michigan.gov](mailto:LyonN2@michigan.gov)>; Adler, Ari (GOV) <[AdlerA@michigan.gov](mailto:AdlerA@michigan.gov)>; Baird, Richard (GOV) <[bairdr@michigan.gov](mailto:bairdr@michigan.gov)>  
**Subject:** Fwd: Release on preliminary results

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

Begin forwarded message:

**From:** "Minicuci, Angela (DHHS)" <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)>  
**Date:** October 18, 2016 at 7:02:04 AM EDT

**To:** "Wells, Eden (DHHS)" <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>, "McFadden, Jevon (DHHS-Contractor)" <[McFaddenJ1@michigan.gov](mailto:McFaddenJ1@michigan.gov)>, "LyonCallo, Sarah (DHHS)" <[lyoncallos@michigan.gov](mailto:lyoncallos@michigan.gov)>, "Lasher, Geralyn (DHHS)" <[lasherg@michigan.gov](mailto:lasherg@michigan.gov)>, "Eisner, Jennifer (DHHS)" <[EisnerJ@michigan.gov](mailto:EisnerJ@michigan.gov)>

**Subject: Fwd: Release on preliminary results**

Please see the attached draft of a WSU release they plan to issue tomorrow. Eden or Jevon, can you please share this with Dr. Beach and his team?

Excuse brevity, sent from my iPhone

Begin forwarded message:

**From:** Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>

**Date:** October 18, 2016 at 6:58:20 AM EDT

**To:** Angela Minicuci <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)>, "Wells, Eden (DHHS)" <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>, "Cupal, Suzanne" <[scupal@gchd.us](mailto:scupal@gchd.us)>

**Cc:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>, Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>, "Zervos, Marcus" <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>, "Laura Sullivan (dr.laura2@gmail.com)" <[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)>, Joanne Sobeck <[ab1350@wayne.edu](mailto:ab1350@wayne.edu)>

**Subject: Release on preliminary results**

Hi Everyone,

Attaches is a release we have developed on the preliminary results from FACHEP. This has been through several rounds of edits and we believe its a very accurate representation of our current results. We anticipating releasing this tomorrow.

Please let me know if you have any questions or concerns.

Thanks,

Matt Seeger

**From:** Matthew Seeger  
**Sent:** Tuesday, October 18, 2016 2:30 PM  
**To:** Minicuci, Angela (DHHS)  
**Cc:** Wells, Eden (DHHS); Shawn Patrick McElmurry; Matthew T Lockwood  
**Subject:** Re: Release on preliminary results

Hi Angela

Thanks for the email. I think that is unlikely that this will be sensationalized but I will try and get that up higher.

Thank you for the suggestion

Matt

Matthew W. Seeger, Ph.D.  
Professor and Dean  
College of Fine, Performing & Communication Arts  
5104 Gullen Mall- The Linsell House

Wayne State University  
Detroit, MI 48202  
Phone: (313) 577-5342  
FAX: (313) 577-5355  
Web: <http://www.cfpca.wayne.edu/>  
Please reply to: [Matthew.Seeger@wayne.edu](mailto:Matthew.Seeger@wayne.edu)

Sent from my iPhone

On Oct 18, 2016, at 2:21 PM, Minicuci, Angela (DHHS) <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)> wrote:

Hi Matt,

This needs to be included somehow in the headline or lead -- otherwise the media sensationalism will quickly overpower the facts:

"...results are not necessarily outside what would be expected in other residential water systems."

Thank you,

Angela

**From:** Matthew Seeger [<mailto:matthew.seeger@wayne.edu>]  
**Sent:** Tuesday, October 18, 2016 6:58 AM  
**To:** Minicuci, Angela (DHHS) <[MinicuciA@michigan.gov](mailto:MinicuciA@michigan.gov)>; Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>;  
Cupal, Suzanne <[scupal@gchd.us](mailto:scupal@gchd.us)>

**Durno, Mark**

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**From:** Durno, Mark  
**Sent:** Tuesday, October 18,  
**To:** 2016 8:28 AM  
**Subject:** Pressman, Jonathan  
Re: Discuss Preliminary Research Results  
**Follow Up**  
**Flag: Flag** Follow up  
**Status:** Flagged

Thanks! Please keep me

posted if any thing new is

learned. I'll do the same.

Sent from my iPhone

On Oct 17, 2016, at 8:25 PM, Pressman, Jonathan  
<[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)> wrote:

FYI

**From:** "Feighner, Bryce {DEQ}"  
<[FEIGHNERB@michigan.gov](mailto:FEIGHNERB@michigan.gov)>  
**Date:** October 17, 2016 at 8:52:04 PM EDT  
**To:** Shawn Patrick McElmurry  
<[s.rncelrnurry@wayne.edu](mailto:s.rncelrnurry@wayne.edu)>  
**Cc:** "jmcday@cityofflint.com"  
<[jmcday@cityofflint.com](mailto:jmcday@cityofflint.com)>, Jonathan Pressman  
<[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>, "Bloemker, Jon  
{DEQ}" <[BLOEMKERJ@michigan.gov](mailto:BLOEMKERJ@michigan.gov)>  
**Subject:** Fwd: Discuss Preliminary Research Results

Hey Shawn,

There is a team of EPA, DEQ and City folks who monitor chlorine residuals and coliform. bacteria routinely. We need to include some of those team members in this discussion. From EPA I would suggest Jonathan Pressman. From my staff I would suggest Jon Bloemker.

Thank. Bryce

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**From:** ShawriPatrTck.Mc:Elmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**Sent:** Monday, October 17, 2016 11:16 AM  
**To:** JoLisa McDay  
**Cc:** Paul

Evan  
Kilgore;  
Sylvester  
Jones;  
Pamela  
Pugh; Nancy  
Love; James  
Henry  
(jhenry@gch  
d.us};  
Wells, Eden  
(DHHS)

**Subject:** Discuss Preliminary Research  
Results

Hello JoLisa, we are beginning to get results back that I think are important for you to know about. A couple key issues that I would like to discuss is:

- We are seeing relatively high amounts of bacteria in water entering a few homes. This data is coming back to us through both the NSF funded study as well as the FACHEP study focused on Legionella.
- We have detected *Legionella pneumophila sero group 6* entering a few homes. While I cannot provide you with the individual residents, due to our IRB and the fact we do not yet have a data sharing agreement, I could describe it at a higher level that would allow for the utility to flush the lines in some areas.
- We are finding chlorine levels to be low (0.2 mg/L) in about 24% of the homes we test. These samples are collected from the cold water tap after 5 minutes of flushing so they should represent, as best we can, the water in the main at these locations. However, I need to caution you on these results. Some of these are from outside the city of Flint. I do not believe there are many from outside Flint (there are a few homes utilizing wells that we have sampled) but I am guessing this is a higher estimate of the true number.

For all of this data I am working today and tomorrow to link our measurements

with spatial descriptors so this information can be more useful. I and a few others from the team will be in Flint Wednesday afternoon. Any chance we could meet to discuss soon?

Also, I would really like to finalize our data sharing agreement this week. This will make discussing this type of information much easier. Additionally, I would like to look at how the incidence of breaks and repairs corresponds to the water quality measurements we are collecting.

As always, please do not hesitate to contact me on my phone anytime (517-944-0996).

Sincerely,  
Shawn MCEimurry

Shawn P. McElmurry,  
Ph.D., P.E. Associate  
Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering

**Durno, Mark**

---

**From:** Durno, Mark  
**Sent:** Tuesday, October 18, 2016 5:19 PM  
**To:** Donnelly, Peggy; Thomas Mendez; Maraldo, Dean; Rogers, Joan; Pressman, Jonathan; Lytle, Darren; Schock, Michael; Shaven, Heather  
**Subject:** FW: FYI - Wayne State/ Kettering release  
**Follow Up**  
**Flag: Flag**  
**Status:** Follow up  
Flagged

FYI - see below and attached.

---

**Mark Durno**  
Homeland Security Advisor/ Deputy  
Chief Emergency Response Branch  
U.S. Environmental Protection Agency  
25063 Center Ridge Road  
Westlake, OH 44145  
440-250-1743

---

**From:** Durno, Mark  
**Sent:** Tuesday, October 18, 2016 4:14 PM  
**To:** Russell, Diane <russell.diane@epa.gov>; Geyer, Rebecca <geyer.rebecca@epa.gov>  
**Subject:** FYI - Wayne State/ Kettering release

FYI - see below and attached.

---

**Mark Durno**  
Homeland Security Advisor/ Deputy  
Chief Emergency Response Branch  
U. S. Environmental Protection Agency  
25063 Center Ridge  
Road Westlake, OH  
44145  
440-250-1743

---

**From:** Durno, Mark  
**Sent:** Tuesday, October 18, 2016 4:11 PM  
**To:**  
**Cc:**  
**Subject:** RE: Flint Week Look-ahead



For situational awareness - Wayne State/ Kettering will be releasing a version of this draft tomorrow on their web-site. Their current findings from their Legionella investigation. Key message include that Legionella is present but looks like other water systems & chlorine is low in 20% of their samples (less than 0.2 mg/L).

## HintLegionnaires...

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**Mark Durno**

Homeland Security Advisor/ Deputy Chief  
Emergency Response Branch  
U.S. Environmental Protection  
Agency 25063 Center Ridge Road  
Westlake, OH 44145  
440-250-1743

10/19/2016

Legionella bacteria found in small percentage of Flint homes tested by university researchers - Newsroom - Wayne State University

WAYNE STATE UNIVERSITY

AIM HIGHER

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### Legionella bacteria found in small percentage of Flint homes tested by university researchers

Findings may not be out of normal range

October 19, 2016

DETROIT — After completing residential water tests in one-third of the 284 Flint homes in its study, the Flint Area Community Health and Environment Partnership (FACHEP) reports that it is detecting Legionella bacteria in a small percentage of some of the homes. Residents in the affected homes have been informed, as has the Michigan Department of Health and Human Services.

"To be clear, these results are not necessarily outside what would be expected in other residential water systems, so this is not necessarily a surprising finding," said Shawn McElmurry, Ph.D., associate professor of civil and environmental engineering at Wayne State University. "Nonetheless, we committed to sharing our findings with the public, and we feel that this is noteworthy."

McElmurry also noted, "So far we've also found chlorine levels in about 20 percent of the homes to be less than current recommendations. The American Water Works Association recommends maintaining a residual chlorine level between 0.2 mg/L and 2.0 mg/L at all times. We've identified some homes that are below 0.2 mg/L. "

All water contains bacteria, much of which is nonpathogenic. Chlorine is the primary chemical used to disinfect drinking water. The damage to the Flint water system has made it more difficult to maintain proper chlorination levels. It is not clear if the presence of Legionella bacteria is more common in some parts of the Flint water system than with others.

"We are looking at that possibility," said McElmurry.

Led by professors from Wayne State University and Kettering University, and funded by the Michigan Department of Health and Human Services, FACHEP is expected to have complete results of its initial testing in December. The team is working to understand the prevalence of Legionella bacteria within Flint's drinking water systems and identify conditions that increase the growth of this bacterium.

WAYNE STATE  
UNIVERSITY  
COLLEGE OF ENGINEERING

November 21, 2016

Dear FACHEP participant;

On Month DAY, YEAR members of the Flint Area Community Health and Environment Partnership (FACHEP) collected water samples from your home and a swab of biofilm from your shower fixture to test for *Legionella* bacteria. Those samples were assigned a number so that we could easily track them. The water samples collected from your house were assigned the sample ID number of XXXXXX.

*Legionella* is a waterborne bacterium that can cause Legionnaires' disease. Legionnaires' disease is contracted by breathing in water vapor that contains *Legionella* bacteria. While *Legionella* bacteria can be a source of concern, the bacteria reside in natural bodies of water and are often found in low levels in water systems considered to be operating properly. For more information about Legionnaires' disease, please see the attached Frequently Asked Questions document.

*Legionella* bacteria was not found in your water samples. This does not mean that the samples were free of *Legionella*. Rather, the results indicate that the number of *Legionella* in your samples were below the amount that we are able to detect with our tests.

The presence of free chlorine in public water distribution systems is intended to reduce the likelihood that *Legionella* and other bacteria will grow within your home water system. The concentration of free chlorine in the water entering your kitchen was found to be XXX ppm after 5 minutes of flushing.

Additional information regarding what these results mean can be found attached. We thank you for participating in our study of Flint drinking water quality. Our research will continue, and we may contact you again in the future. If you have any questions, please do not hesitate to contact the FACHEP team (844-35-FLINT; [flintpartnership@wayne.edu](mailto:flintpartnership@wayne.edu)).

Sincerely,



Shawn P. McElmurry, PhD, PE  
Principal Investigator FACHEP

### **What does the amount of chlorine tell you?**

Chlorine is a common disinfectant used to inhibit microbial growth in public drinking water. While some micro-organisms can sometimes survive in an environment containing chlorine<sup>2</sup> free chlorine is intended to reduce the likelihood that *Legionella* and other bacteria will grow within your home water system. The American Water Works Association recommends maintaining this chlorine level between 0.2 mg/L and 2.0 mg/L at all times in water distribution systems<sup>3</sup>.

### **How was chlorine measured?**

The concentration of free chlorine was measured at your kitchen tap after 5 minutes of flushing. This method ensures the concentration of chlorine measured is the concentration entering your home from the water main. This concentration was determined using a widely accepted<sup>4,5</sup> technique involving CHEMetrics Vacu-Vials. These vials contain a chemical called DPD (N,N Diethyl-1,4 phenylenediamine Sulfate) that reacts with free chlorine to produce a pink to purple color; the darker the color, the greater the concentration of chlorine. The extent of color change is determined using a portable spectrophotometer and the concentration is reported in parts per million (PPM) – parts of chlorine per million units of water sample.

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<sup>1</sup> <https://wwwn.cdc.gov/ELITE/Public/ELITEHome.aspx>

<sup>2</sup> Haas, C. N., Meyer, M. A., & Paller, M. S. (1983). Microbial alterations in water distribution systems and their relationship to physical-chemical characteristics. *Journal American Water Works Association*, 475-481.

<sup>3</sup> Pontius, F.W. and AWWA. (1990). Water quality and treatment: A handbook of community water supplies. In *Water quality and treatment: a handbook of community water supplies*. American Water Works Association (AWWA); New York. p 1194.

From: "Wells, Eden (DHHS)" <WellsE3@michigan.gov> Date: October 19, 2016 at 7:29:11 PM EDT

To: "Lyon, Nick (DHHS)" <LyonN2@michigan.gov>, "Vreibel, Nancy (DHHS)" <VreibelN@michigan.gov>, "Hanley, Farah (DHHS)" <hanleyf@michigan.gov>, "Zimmer, Mike (GOV)" <ZimmerM1@michigan.gov>, "Baird, Richard (GOV)" <bairdr@michigan.gov>, "Lasher, GERALYN (DHHS)" <lasherg@michigan.gov>, "Minicuci, Angela (DHHS)" <MinicuciA@michigan.gov>, "Moran, Susan (DHHS)" <MoranS@michigan.gov>, "Krause, Kurt (DHHS)" <KrauseK2@michigan.gov> Cc: "Richards, Denise (DHHS)" <richardsd@michigan.gov> Subject: Fwd: FACHEP Communications regarding research findings

FYI- we cannot keep spending multiple hours and multiple days trying to address what could be very simple communication issues with this group. I'm very concerned they are not aware of the public health context of their research.

Eden V. Wells, MD, MPH, FACPM Chief Medical Executive Michigan Department of Health and Human Services Tel: 517-284-4020

Sent from my iPhone, please excuse typos

On Oct 19, 2016, at 2:45 PM, Wells, Eden (DHHS)

<[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)> wrote:

Shawn I've tried to reach you, Matthew Seeger and Paul Kilgore with no response.

I'm urging one of you to contact our communication staff immediately particularly Jennifer Eisner who has some questions that apparently only you can answer. Our attorneys general's office has reviewed your press release and our responses to try to address the public health ramifications of your press release. There is some concern regarding any communications that you were advising people about apparent low chlorine levels.

Please call me or Jennifer now.

Eden V. Wells, MD, MPH, FACPM

Begin forwarded message:

From: "Wells, Eden (DHHS)" <WellsE3@michigan.gov> Date: October 19, 2016 at 7:27:29 PM EDT To: "Zervos, Marcus" <MZERVOS1@hfhs.org> Cc: Matthew Seeger <matthew.seeger@wayne.edu>, Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>, Paul Evan Kilgore <paul.kilgore@wayne.edu>, "Lasher, GERALYN (DHHS)" <lasherg@michigan.gov>, "Minicuci, Angela (DHHS)" <MinicuciA@michigan.gov>, "Eisner, Jennifer (DHHS)" <EisnerJ@michigan.gov> Subject: FACHEP Communications regarding research findings  
Good evening,

Agree but, again, you ALL will need to be working with local and state PH agency communications staff as I've stated before, when what you are doing, and then releasing information to the public on -has clear public health implications.

Your group today seems to want to throw out some vague information about finding some cases, without controls, with no context and THEN throw your hands up and say "oh we have nothing to do about it, that is a public

health issue". Yes, Dr. Zervos, I keep hearing that statement from you others in your group as well.

However, that is not good a basis for good communication for the PUBLIC or your collaborative partners. Your statements stating that you have no role exemplifies your lack of knowledge or sensitivity to public health issues when producing early unconfirmed and uncontrolled results from your studies.

Do I think it was good for you to notify the public about some of the work you've been finding, yes, because you had been sharing results with your clients.

Of some alarm that I am having is that apparently your group has not understood the need for a communications plan that addresses these exact same issues we've been dealing with in the last week or two regarding communications with you. And if you are not cognizant of the fact that what you're releasing in this last week doesn't have public health implications and that you must work with your partners regarding the obvious questions and responses (such as what you are telling residents about their chlorine levels) that THEN has to be dealt with by the local and state health department, if not also the DEQ, the City, federal CDC and EPA, then I think we need to have an immediate discussion about further communications planning. The media will immediately call us to ask if we are issuing boil water alerts (or ask why we are reportedly blocking you from getting isolates, as you could see from today)

And I would like to point out I still have yet to get an answer from any of you about how to address the chlorine issues that you are apparently reporting out to your residents but not sharing with us in public health so we can understand what the public health implications are- The questions we are getting from our attorneys were for whether the any of these issues indicated a boil water alert! I was able to get a response from Mr. Feigner over at DEQ who assisted me with this but not from any of you. And that took quite a bit a valuable time from my schedule today. And my sense is my meetings were just as important as yours, maybe more so.

These experiences really could have been less complicated- the filter issue and this issue have taken up an INORDINATE amount of time from local state and federal agencies who are already stressed to the maximum to try to deal with responses for important day-to-day issues in our state. We are funding you to be responsible research partners for a PUBLIC HEALTH issue. While you are independent, you do not operate in isolation, and you are responsible for the impact that your statements may cause in the population that you deliver them to. If that is not clear I will be glad to set up a meeting that we can all discuss.

But the multiple hours that I have spent myself not even counting all the many many hours from all the other agencies I've just cited is absolutely not something we can continue to keep doing it every time that you all do something. And in discussion with other national experts, I am concerned that these issues seem to be being made more complicated than they should be.

I do value your respective expertise, but am disappointed in your (FACHEP's)

lack of understanding of the public health impact your work does have that requires a need to collaborate with the local, state and federal agencies to place your academic findings into public health context.

Eden V. Wells, MD, MPH, FACPM Chief Medical Executive Michigan Department of Health and Human Services Tel: 517-284-4020

Sent from my iPhone, please excuse typos

On Oct 19, 2016, at 2:48 PM, Zervos, Marcus <MZERVOS1@hfhs.org> wrote:  
I concur with that we are not a health department, our role is research only, we are making no public health recommendations

From: Matthew Seeger [mailto:matthew.seeger@wayne.edu] Sent: Wednesday, October 19, 2016 2:46 PM To: Wells, Eden (DHHS) <WellsE3@michigan.gov> Cc: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Paul Evan Kilgore <paul.kilgore@wayne.edu>; Zervos, Marcus <MZERVOS1@hfhs.org>; Lasher, Geralyn (DHHS) <laserhg@michigan.gov>; Minicuci, Angela (DHHS) <Minicucia@michigan.gov>; Eisner, Jennifer (DHHS) <EisnerJ@michigan.gov> Subject: Re: Communications regarding your research project

I'll call Angela as soon as I have a break. I'm on a CDC call now. As I indicated earlier FACHEP is making no public health recommendations. We are not a health department and whatever we say would be inappropriate. We are trying very hard to stay in our lane. We referenced existing documents in the release. Matt Matthew W. Seeger, Ph.D. Professor and Dean College of Fine, Performing & Communication Arts 5104 Gullen Mall- The Linsell House

Wayne State University  
Detroit, MI 48202 Phone: (313) 577-5342 FAX: (313) 577-5355 Web:  
<http://www.cfpc.wayne.edu/> Please reply to: Matthew.Seeger@wayne.edu

Sent from my iPhone

On Oct 19, 2016, at 2:45 PM, Wells, Eden (DHHS) <WellsE3@michigan.gov> wrote: Shawn I've tried to reach you, Matthew Seeger and Paul Kilgore with no response. I'm urging one of you to contact or communication staff immediately particularly Jennifer Eisner who has some questions that apparently only you can answer. Our attorneys general's office Has reviewed your press release and our responses to try to address the public health ramifications of your press release. There is some concern regarding any communications that you were advising people about apparent low chlorine levels. Please call me or Jennifer now.

Eden V. Wells, MD, MPH, FACPM Chief Medical Executive Michigan Department of Health and Human Services Tel: 517-284-4020

Sent from my iPhone, please excuse typos

**NEXT:**

From: "Wells, Eden (DHHS)" <WellsE3@michigan.gov> Date: October 19, 2016 at 7:29:11 PM EDT



To: "Lyon, Nick (DHHS)" <LyonN2@michigan.gov>, "Vreibel, Nancy (DHHS)" <VreibelN@michigan.gov>, "Hanley, Farah (DHHS)" <hanleyf@michigan.gov>, "Zimmer, Mike (GOV)" <ZimmerM1@michigan.gov>, "Baird, Richard (GOV)" <bairdr@michigan.gov>, "Lasher, Geralyn (DHHS)" <lasherg@michigan.gov>, "Minicuci, Angela (DHHS)" <MinicuciA@michigan.gov>, "Moran, Susan (DHHS)" <MoranS@michigan.gov>, "Krause, Kurt (DHHS)" <KrauseK2@michigan.gov> Cc: "Richards, Denise (DHHS)" <richardsd@michigan.gov> Subject: Fwd: FACHEP Communications regarding research findings

FYI- we cannot keep spending multiple hours and multiple days trying to address what could be very simple communication issues with this group. I'm very concerned they are not aware of the public health context of their research.

Eden V. Wells, MD, MPH, FACPM Chief Medical Executive Michigan Department of Health and Human Services Tel: 517-284-4020

Sent from my iPhone, please excuse typos

On Oct 19, 2016, at 2:45 PM, Wells, Eden (DHHS)

<[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)> wrote:

Shawn I've tried to reach you, Matthew Seeger and Paul Kilgore with no response.

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Eden V. Wells, MD, MPH, FACPM

Begin forwarded message:

From: "Wells, Eden (DHHS)" <WellsE3@michigan.gov> Date: October 19, 2016 at 7:27:29 PM EDT To: "Zervos, Marcus" <MZERVOS1@hfhs.org> Cc: Matthew Seeger <matthew.seeger@wayne.edu>, Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>, Paul Evan Kilgore <paul.kilgore@wayne.edu>, "Lasher, Geralyn (DHHS)" <lasherg@michigan.gov>, "Minicuci, Angela (DHHS)" <MinicuciA@michigan.gov>, "Eisner, Jennifer (DHHS)" <EisnerJ@michigan.gov> Subject: FACHEP Communications regarding research findings  
Good evening,

Agree but, again, you ALL will need to be working with local and state PH agency communications staff as I've stated before, when what you are doing, and then releasing information to the public on -has clear public health implications.

Your group today seems to want to throw out some vague information about finding some cases, without controls, with no context and THEN throw your hands up and say "oh we have nothing to do about it, that is a public health issue". Yes, Dr. Zervos, I keep hearing that statement from you others in your group as well.



However, that is not good a basis for good communication for the PUBLIC or your collaborative partners. Your statements stating that you have no role exemplifies your lack of knowledge or sensitivity to public health issues when producing early unconfirmed and uncontrolled results from your studies.

Do I think it was good for you to notify the public about some of the work you've been finding, yes, because you had been sharing results with your clients.

Of some alarm that I am having is that apparently your group has not understood the need for a communications plan that addresses these exact same issues we've been dealing with in the last week or two regarding communications with you. And if you are not cognizant of the fact that what you're releasing in this last week doesn't have public health implications and that you must work with your partners regarding the obvious questions and responses (such as what you are telling residents about their chlorine levels) that THEN has to be dealt with by the local and state health department, if not also the DEQ, the City, federal CDC and EPA, then I think we need to have an immediate discussion about further communications planning. The media will immediately call us to ask if we are issuing boil water alerts (or ask why we are reportedly blocking you from getting isolates, as you could see from today)

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I do value your respective expertise, but am disappointed in your (FACHEP's) lack of understanding of the public health impact your work does have that requires a need to collaborate with the local, state and federal agencies to

place your academic findings into public health context.

Eden V. Wells, MD, MPH, FACPM Chief Medical Executive Michigan Department of Health and Human Services Tel: 517-284-4020

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I'll call Angela as soon as I have a break. I'm on a CDC call now. As I indicated earlier FACHEP is making no public health recommendations. We are not a health department and whatever we say would be inappropriate. We are trying very hard to stay in our lane. We referenced existing documents in the release. Matt Matthew W. Seeger, Ph.D. Professor and Dean College of Fine, Performing & Communication Arts 5104 Gullen Mall- The Linsell House

Wayne State University  
Detroit, MI 48202 Phone: (313) 577-5342 FAX: (313) 577-5355 Web:  
<http://www.cfpca.wayne.edu/> Please reply to: Matthew.Seeger@wayne.edu

Sent from my iPhone

On Oct 19, 2016, at 2:45 PM, Wells, Eden (DHHS) <WellsE3@michigan.gov> wrote: Shawn I've tried to reach you, Matthew Seeger and Paul Kilgore with no response. I'm urging one of you to contact or communication staff immediately particularly Jennifer Eisner who has some questions that apparently only you can answer. Our attorneys general's office Has reviewed your press release and our responses to try to address the public health ramifications of your press release. There is some concern regarding any communications that you were advising people about apparent low chlorine levels. Please call me or Jennifer now.

Eden V. Wells, MD, MPH, FACPM Chief Medical Executive Michigan Department of Health and Human Services Tel: 517-284-4020

Sent from my iPhone, please excuse typos

**From:** Wells, Eden (DHHS) <WellsE3@michigan.gov>  
**Sent:** Wednesday, October 19, 2016 7:53 AM  
**To:** Matthew Seeger; Shawn Patrick McElmurry  
**Subject:** Fwd: Revised Release

Shawn- please remember to include DEQ in any issues regarding chlorine. Marc Edwards also told me that maintaining chlorine throughout households is an issue nationally, if I recall him correctly, so this also begs the issue for controls- As Bryce says below, you may not have evidence of below

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

Begin forwarded message:

**From:** "Krisztian, George (DEQ)" <krisztian@michigan.gov>  
**Date:** October 19, 2016 at 7:50:49 AM EDT  
**To:** "Wells, Eden (DHHS)" <WellsE3@michigan.gov>  
**Cc:** "Feighner, Bryce (DEQ)" <FEIGHNERB@michigan.gov>, "Creagh, Keith (DNR)" <creaghk@michigan.gov>  
**Subject:** Re: Revised Release

Hi Eden,

I think the statement that the damage done to the system has made it more difficult to maintain chlorine residuals should be removed. There is no basis for this statement. To my knowledge there was no testing done prior to the incident that compares with what is currently being done. In addition there IS proof that excessive water age due to an oversized infrastructure does make it more difficult to maintain residuals. A statement regarding infrastructure size should be the statement.

I think it is critical that we focus on what we can prove.

Thank you for including us!  
George

Sent from my iPhone

On Oct 19, 2016, at 7:11 AM, Wells, Eden (DHHS) <WellsE3@michigan.gov> wrote:

Eden V. Wells, MD, MPH, FACPM

Cincinnati, Ohio 45268  
Phone: (513) 569-7625  
Fax: (513) 487-2543  
[pressman.jonathan@epa.gov](mailto:pressman.jonathan@epa.gov)

**From:** Feighner, Bryce (DEQ) [<mailto:FEIGHNERB@michigan.gov>]  
**Sent:** Thursday, October 20, 2016 11:39 AM  
**To:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**Cc:** Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>; Robert Bincsik <[rbincsik@cityofflint.com](mailto:rbincsik@cityofflint.com)>; [jmcdlay@cityofflint.com](mailto:jmcdlay@cityofflint.com); Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>; Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>; Krisztian, George (DEQ) <[krisztian@michigan.gov](mailto:krisztian@michigan.gov)>  
**Subject:** Re: Question regarding chlorine levels

Yes, we need the locations so the City, EPA, DEQ and the consultant who is working on optimizing the distribution system can address the issues in the long run. As far as the immediate response, the City needs to be informed of the locations so they can respond perhaps by flushing, bacti sampling, etc. Low residuals in and of themselves are not a reason to boil water. The City does need to know this info ASAP, so the City can follow up. There may be regulatory requirements for the City associated with their response.

Sent from my iPhone

On Oct 20, 2016, at 10:03 AM, Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)> wrote:

Yes Mark. I will share as soon as we get it pulled together. Student was supposed to have done it by today but has not. I will get you street level as soon as we have it done.

Shawn

**From:** Durno, Mark [<mailto:durno.mark@epa.gov>]  
**Sent:** Thursday, October 20, 2016 11:01 AM  
**To:** Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**Cc:** Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>;

Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>; feighnerb@michigan.gov  
**Subject:** RE: Question regarding chlorine levels

We'll share this and get feedback from our disinfection experts. Stay tuned.

Shawn – can you provide the data and addresses (or at least the bounded streets) so that we can evaluate the data compared to ours. That would better help us advise.

Thanks.

Mark

---

**Mark Durno**

Homeland Security Advisor / Deputy Chief

Emergency Response Branch

**U.S. Environmental Protection Agency**

25063 Center Ridge Road

Westlake, OH 44145

440-250-1743

**From:** Wells, Eden (DHHS) [<mailto:WellsE3@michigan.gov>]

**Sent:** Thursday, October 20, 2016 9:34 AM

**To:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>

**Cc:** Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>;

Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>; feighnerb@michigan.gov;

Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>

**Subject:** RE: Question regarding chlorine levels

Hi there,

I need to defer to the water experts, because this is not my area. Looping in Bryce and Mark D. If this was an issue in October 2015, what were your recommendations then for the individual residents?

I am not clear still of whether there is a need for additional precautions or not based on your findings-

Have you discussed this with the GCHD as well?

Eden

**Eden V. Wells, MD, MPH, FACPM**

**Chief Medical Executive**

**Michigan Department of Health and Human Services**

**P.O. Box 30195**

**Lansing, MI 48909**

**(517)-284-4998**

**From:** Shawn Patrick McElmurry [<mailto:s.mcelmurry@wayne.edu>]

**Sent:** Thursday, October 20, 2016 10:22 AM

**To:** Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>

**Cc:** Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>;

Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>

**Subject:** Question regarding chlorine levels

Hello Eden, Matt Seeger informed me you had questions about chlorine residual and the 0.2 mg/L criteria we reported. Here is what we know.

The presence of residual free chlorine in water distribution systems is the primary protection against bacteria in the US. The American Water Works Association (AWWA) recommends chlorine levels to be between 0.2 mg/L and 2.0 mg/L at all times. The susceptibility of bacteria to chlorine disinfection is a function of concentration, pH, temperature, and the exposure time. This susceptibility varies widely across species. The effectiveness of chlorine-based disinfectants is further affected by pH and temperature. Maintaining a free chlorine residual of 0.2 mg/L does not create a sterile environment and there will always be bacteria present in drinking water. Part of the reason for this is the presence of



biofilms that create microenvironments where bacteria can effectively be shielded from chlorine in the bulk water.

With regard specifically to *Legionella*, suspended *Legionella* can be inactivated within 15 minutes by 0.4 mg/L chlorine (Yabuuchi et al., 1995). However, as *Legionella* is known to reside in biofilms attached to pipe walls and to replicate within predatory free-living protozoa (Falkinham et al., 2015), much higher doses of chlorine may be required to achieve the same level of disinfection. Based on multiple sources, Yu-sen et al. concluded that "inactivation and suppression of *L. pneumophila* requires chlorine levels of greater than 3 ppm, while the residual level in domestic water is usually less than 1.0 ppm" (Yu-sen et al., 1998)."

We do find the fact that ~20% of our samples collected from the kitchen sink after 5 minutes of flushing are less than 0.2 mg/L to be concerning. This is similar to what we observed in October 2015. Part of the challenge we have with this is there is almost nothing the individual resident can do. After flushing for 5 minutes this sample essentially represents water that is coming into the home from the water main. This is the reason why I have shared this information with Mark Durno from US EPA and JoLisa McDay, Flint's water utility manager. The results have also been communicated with the MDEQ, EPA, etc. We are working as fast as possible to connect the de-identified data to specific addresses. This is not a quick process for us but as soon as we get this done, we will be sharing this information with the MDEQ, US EPA and utility personnel so that they can address this problem appropriately.

What do you suggest we tell the residents whose water entering their homes has chlorine levels less than 0.2 mg/L? Please note that the water coming from the water filters will not have residual chlorine, as the activated carbon in the filters destroys chlorine. Therefore, should we be advising residents of additional precautions they should take for filtered water (e.g., boiling)?

Sincerely,

Shawn

Falkinham, J.O., 3rd, Hilborn, E.D., Arduino, M.J., Pruden, A., and Edwards, M.A. (2015). Epidemiology and Ecology of Opportunistic Premise Plumbing Pathogens: *Legionella pneumophila*, *Mycobacterium avium*, and *Pseudomonas aeruginosa*. Environmental health perspectives 123, 749-758.

Yabuuchi, E., Mori, M., Saito, A., Kishimoto, T., Yoshizawa, S., Arakawa, M., Kinouchi, R., Wang, L., Furuhashi, K., Koide, M., and et al. (1995). [An outbreak of Pontiac fever due to *Legionella pneumophila* serogroup 7. II. Epidemiological aspects]. Kansenshogaku zasshi The Journal of the Japanese Association for Infectious Diseases 69, 654-665.

Yu-sen, E.L., Vidic, R.D., Stout, J.E., and Victor, L.Y. (1998). Legionella in water distribution systems. American Water Works Association Journal 90, 112.

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering  
2158 Engineering Building  
5050 Anthony Wayne Dr.  
Detroit, Michigan 48202  
Phone: 313-577-3876  
Fax: 313-577-3881  
Skype: s.mcelmurry  
[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)



Shawn McElmurry

---

**From:** Shawn Patrick McElmurry  
**Sent:** Thursday, October 20, 2016 9:04 PM  
**To:** Paul Evan Kilgore  
**Subject:** FW:

I'd like to discuss this with you.

**From:** Laura Sullivan [mailto:dr.laura2@gmail.com]  
**Sent:** Thursday, October 20, 2016 4:44 PM  
**To:** Paul Evan Kilgore <paul.kilgore@wayne.edu>; Zervos, Marcus <MZERVOS1@hfhs.org>; Matthew Seeger <matthew.seeger@wayne.edu>; Joanne Sobeck <ab1350@wayne.edu>; Joanne P. Smith-Darden <jo.smith-darden@wayne.edu>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>  
**Cc:** Nancy Love <nglove@umich.edu>; Susan Masten <masten@egr.msu.edu>  
**Subject:**

All,

I've been in touch with Shawn regarding the reductions in our subcontract that resulted from the state's decision to hold back a portion of the FACHEP budget until October 1, and subsequent reluctance to award the balance post-October 1. I'm livid over the inordinate amount of time that Shawn has had to spend to simply get the funding that was promised, then unpromised, then promised.

More and more friends have asked me how they can help Flint. I spoke at Temple University last night where students and faculty offered donations and assistance with getting more donations. So I'm working on a crowdfunding site. Funds could be used to help residents with the cost of making their own plumbing safe. The crowd funding site will hopefully also be used to help bring household water accounts up to date for homes slated for service line replacement but put on hold due to account inactivity. A third use could be to cover some FACHEP cost that the State fails to supply.

We know that one big reason for this water crisis has been federal and state agencies restricting funds, resulting in inaction.

I'd like to stop this cycle. The text below might be too bold, but it's accurate. I know FACHEP is composed of people with high character. Maybe the state is beginning to realize the implications of this? I want the people of Flint to know, too.

I propose that MDHHS has until Nov 1 to supply the balance of funding to FACHEP. Should they fail to do so, I propose releasing the following statement:

"We recognize that at more than one time during the Flint water crisis, the resources necessary for one entity to investigate concerns were restricted by another entity. The result has been unaddressed concerns and silenced whistleblowers. The Michigan DHHS has thus far failed to release promised funding to FACHEP that was due on October 1. We want the people of Flint to know that our team members will accept reductions in compensation so that the supplies, staff, and analysis can go uninterrupted."

Thanks, all, for the integrity you've already demonstrated to Flint. History will show that in the aftermath of tragedy at the hands of opportunists, you were among the first to demonstrate the nobility of great men.

Laura

--  
Laura L. Sullivan, Ph. D.  
3101 Hawthorne Drive  
Flint, Michigan 48503  
[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)

**Subject:**RE: FACHEP Free chlorine levels

**Date:**Thu, 3 Nov 2016 04:51:36 +0000

**From:**Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>

**To:**Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>

**CC:**Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>, Robert Bincsik <[rbincsik@cityofflint.com](mailto:rbincsik@cityofflint.com)>, Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)> <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>, [jmcd@cityofflint.com](mailto:jmcd@cityofflint.com) <[jmcd@cityofflint.com](mailto:jmcd@cityofflint.com)>, James Henry <[jhenry@gchd.us](mailto:jhenry@gchd.us)> <[jhenry@gchd.us](mailto:jhenry@gchd.us)>, Krisztian, George (DEQ) <[krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)>, Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>, Mark Adas <[mas@cityofflint.com](mailto:mas@cityofflint.com)>, Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>, [feighnerb@michigan.gov](mailto:feighnerb@michigan.gov) <[feighnerb@michigan.gov](mailto:feighnerb@michigan.gov)>, John Monsees <[jmonsees@cityofflint.com](mailto:jmonsees@cityofflint.com)>, Dugan, Alison <[Dugan.Alison@epa.gov](mailto:Dugan.Alison@epa.gov)>, Alexander, Matthew <[Alexander.Matthew@epa.gov](mailto:Alexander.Matthew@epa.gov)>, Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>, Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>, Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>, Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>, Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>

Hey Jonathan, thanks for the follow up. I appreciate the challenge this posed given the lag in data. Unfortunately, this data was never intended to be used in a timely matter. We are working to update our procedures to more easily share the location data and reduce the delay.

Shawn

**From:** Pressman, Jonathan [<mailto:Pressman.Jonathan@epa.gov>]

**Sent:** Monday, October 31, 2016 9:35 AM

**To:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)> <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; [jmcd@cityofflint.com](mailto:jmcd@cityofflint.com); James Henry <[jhenry@gchd.us](mailto:jhenry@gchd.us)> <[jhenry@gchd.us](mailto:jhenry@gchd.us)>; Krisztian, George (DEQ) <[krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)>; Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Mark Adas <[mas@cityofflint.com](mailto:mas@cityofflint.com)>; Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>; [feighnerb@michigan.gov](mailto:feighnerb@michigan.gov); Robert Bincsik <[rbincsik@cityofflint.com](mailto:rbincsik@cityofflint.com)>; John Monsees <[jmonsees@cityofflint.com](mailto:jmonsees@cityofflint.com)>; Dugan, Alison <[Dugan.Alison@epa.gov](mailto:Dugan.Alison@epa.gov)>; Alexander, Matthew <[Alexander.Matthew@epa.gov](mailto:Alexander.Matthew@epa.gov)>

**Cc:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>

**Subject:** RE: FACHEP Free chlorine levels

All

Last week, a team from Flint, MDEQ, and EPA investigated chlorine residuals at some of the low sites (and one high site) previously reported by FACHEP. See attached spreadsheet with chlorine residuals taken from hydrants closest to the rounded addresses supplied by FACHEP. In the second attachment, I have highlighted the same locations for comparison. The lowest free chlorine measured last week was 0.61mg/L.

There are multiple potential explanations for these results, however, the primary confounding factor is that more than a month passed between the

sampling dates. Therefore, it is difficult to investigate with any further detail the extent of low chlorine in those homes reported by FACHEP, particularly without the exact addresses and interest of residents for follow-up by the water utility.

It would be helpful in the future, when FACHEP samplers encounter low chlorine residuals in homes after flushing, to notify the Flint Water Utility on the same day the low chlorine results are detected and to inquire with residents for permission for Water Utility staff to follow-up with the residents. In this way, as a public/private partnership, all involved can participate in understanding the root cause and developing solutions to protect public health.

Regards  
Jonathan

Jonathan Pressman, Ph.D., P.E.  
U.S. Environmental Protection Agency  
Water Supply & Water Resources Division  
National Risk Management Research Laboratory  
26 West Martin Luther King Drive (msG75)  
Cincinnati, Ohio 45268  
Phone: (513) 569-7625  
Fax: (513) 487-2543  
[pressman.jonathan@epa.gov](mailto:pressman.jonathan@epa.gov)

**From:** Shawn Patrick McElmurry [<mailto:s.mcelmurry@wayne.edu>]  
**Sent:** Monday, October 24, 2016 4:12 PM  
**To:** Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>; Wells, Eden (DHHS) ([WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; [jmcdday@cityofflint.com](mailto:jmcdday@cityofflint.com); James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us)) <[jhenry@gchd.us](mailto:jhenry@gchd.us)>; Krisztian, George (DEQ) <[krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)>; Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Mark Adas <[madas@cityofflint.com](mailto:madas@cityofflint.com)>; Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>; [feighnerb@michigan.gov](mailto:feighnerb@michigan.gov)  
**Cc:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>  
**Subject:** RE: FACHEP Free chlorine levels

Yes, see attached. Addresses have been rounded to protect individual identity. Regardless, please keep confidential.

Shawn

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**Sent:** Monday, October 24, 2016 4:04 PM  
**To:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Wells, Eden (DHHS) ([WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; [jmcdday@cityofflint.com](mailto:jmcdday@cityofflint.com); James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us)) <[jhenry@gchd.us](mailto:jhenry@gchd.us)>; Krisztian, George (DEQ) <[krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)>; Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Mark Adas

<[mdas@cityofflint.com](mailto:mdas@cityofflint.com)>; Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>;  
[feighnerb@michigan.gov](mailto:feighnerb@michigan.gov)  
**Cc:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger  
<[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten  
<[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>  
**Subject:** RE: FACHEP Free chlorine levels

Hi Shawn

Thanks for the JPG Map, it's a great starting point. However, it is not possible for the utility to properly investigate these areas, or to compare data to other datasets without street level detail. Can you please provide the following data as it relates to chlorine residual:

Date

Address

Actual Chlorine residual

Thanks

Jonathan

Jonathan Pressman, Ph.D., P.E.  
U.S. Environmental Protection Agency  
Water Supply & Water Resources Division  
National Risk Management Research Laboratory  
26 West Martin Luther King Drive (msG75)  
Cincinnati, Ohio 45268  
Phone: (513) 569-7625  
Fax: (513) 487-2543  
[pressman.jonathan@epa.gov](mailto:pressman.jonathan@epa.gov)

**From:** Shawn Patrick McElmurry [<mailto:s.mcelmurry@wayne.edu>]  
**Sent:** Monday, October 24, 2016 3:34 PM  
**To:** Wells, Eden (DHHS) ([WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>;  
[jmcdays@cityofflint.com](mailto:jmcdays@cityofflint.com); James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us)) <[jhenry@gchd.us](mailto:jhenry@gchd.us)>;  
Krisztian, George (DEQ) <[krisztian@michigan.gov](mailto:krisztian@michigan.gov)>; Durno, Mark  
<[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>; Mark  
Adas <[mdas@cityofflint.com](mailto:mdas@cityofflint.com)>; Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>;  
[feighnerb@michigan.gov](mailto:feighnerb@michigan.gov)  
**Cc:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger  
<[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten  
<[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>  
**Subject:** FACHEP Free chlorine levels

All, over the weekend we managed to pull together the data for the first 56 houses sampled in Flint so we could connect spatial attributes to the chlorine measurements we discussed last week. Attached is a GIS map showing the results. These samples were collect Sept. 6 - Oct. 5. Please note there are not 56 points (some had to be tossed for because the house had a whole house filter, etc).

As I mentioned last week, these chlorine measurements were obtained from the Kitchen Faucet, bypassing the PoU filters, following sampling from other locations in the house and after an additional 5 minutes of flushing. We are

working to update our database as fast as possible and I will share this information with you as soon as it I get it.

Sincerely,  
Shawn P. McElmurry

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering  
2158 Engineering Building  
5050 Anthony Wayne Dr.  
Detroit, Michigan 48202  
Phone: 313-577-3876  
Fax: 313-577-3881  
Skype: s.mcelmurry  
[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)

On 10/24/2016 9:58 PM, Shawn Patrick McElmurry wrote:

I feel like he is splitting hairs here but I'll have to respond. I can't remember how this sentence made it in...if we had a real quote to reference or not. Do you?

**From:** Pressman, Jonathan [<mailto:Pressman.Jonathan@epa.gov>]  
**Sent:** Monday, October 24, 2016 4:42 PM  
**To:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**Subject:** RE: FACHEP Free chlorine levels

On a separate note, without all the others copied, Im curious to know the reference of the quote below from your press release. I have been thinking about this for awhile. The sources of chlorine residual advice that I am most immediately familiar with, such as the AWWA partnership for safe water, use a 95% of the time statement, not "at all times".

"The American Water Works Association recommends maintaining a residual chlorine level between 0.2 mg/L and 2.0 mg/L at all times."

Regards  
Jonathan

Jonathan Pressman, Ph.D., P.E.  
U.S. Environmental Protection Agency  
Water Supply & Water Resources Division  
National Risk Management Research Laboratory  
26 West Martin Luther King Drive (msG75)  
Cincinnati, Ohio 45268  
Phone: (513) 569-7625  
Fax: (513) 487-2543  
[pressman.jonathan@epa.gov](mailto:pressman.jonathan@epa.gov)

**From:** Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>

**Sent:** Wednesday, December 26, 2018 11:05 AM

**To:** Marc Edwards <edwardsm@vt.edu>

**Subject:** RE: Re: FW: FACHEP Free chlorine levels

I just searched my emails, there is no reply from him on that question. I only have two emails from him after I sent that, and both are in reference to low chlorine data in the DS - but not the question I posed.

Jonathan G. Pressman, Ph.D., P.E.  
Research Environmental Engineer  
U.S. Environmental Protection Agency  
Office of Research and Development  
National Risk Management Research Laboratory  
Water Systems Division  
Drinking Water Treatment and Distribution Branch  
26 West Martin Luther King Drive (msG75)  
Cincinnati, Ohio 45268  
Phone: (513) 569-7625

[pressman.jonathan@epa.gov](mailto:pressman.jonathan@epa.gov)

**From:** [edwardsm@vt.edu](mailto:edwardsm@vt.edu) <[edwardsm@vt.edu](mailto:edwardsm@vt.edu)>

**Sent:** Tuesday, December 25, 2018 12:28 AM

**To:** Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>

**Subject:** FW: Re: FW: FACHEP Free chlorine levels

Jonathan,

So when you asked him for the reference on this:  
**"The American Water Works Association recommends maintaining a residual chlorine level between 0.2 mg/L and 2.0 mg/L at all times."**

Did he send you the reference? This was the exact question I asked him many times.

Below he says he will craft and send you a response...even though you are splitting hairs.

I like how he says "I can't remember how this sentence made it in...if we had a real quote to reference or not?"

Marc

On 10/24/2016 9:58 PM, Shawn Patrick McElmurry wrote:

I feel like he is splitting hairs here but I'll have to respond. I can't remember how this sentence made it in...if we had a real quote to reference or not. Do you?



**From:** Shawn Patrick McElmurry [<mailto:s.mcelmurry@wayne.edu>]  
**Sent:** Monday, October 24, 2016 4:12 PM  
**To:** Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>; Wells, Eden (DHHS) ([WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; [jmcdday@cityofflint.com](mailto:jmcdday@cityofflint.com); James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us)) <[jhenry@gchd.us](mailto:jhenry@gchd.us)>; Krisztian, George (DEQ) <[krisztian@michigan.gov](mailto:krisztian@michigan.gov)>; Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Mark Adas <[masdas@cityofflint.com](mailto:masdas@cityofflint.com)>; Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>; [feighnerb@michigan.gov](mailto:feighnerb@michigan.gov)  
**Cc:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>  
**Subject:** RE: FACHEP Free chlorine levels

Yes, see attached. Addresses have been rounded to protect individual identity. Regardless, please keep confidential.

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**Cc:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>  
**Subject:** RE: FACHEP Free chlorine levels

Hi Shawn

Thanks for the JPG Map, it's a great starting point. However, it is not possible for the utility to properly investigate these areas, or to compare data to other datasets without street level detail. Can you please provide the following data as it relates to chlorine residual:

Date

Address

Actual Chlorine residual

Thanks

Jonathan

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Phone: (513) 569-7625  
Fax: (513) 487-2543  
[pressman.jonathan@epa.gov](mailto:pressman.jonathan@epa.gov)





Shawn McElmurry

**From:** Shawn Patrick McElmurry  
**Sent:** Saturday, October 29, 2016 11:05 AM  
**To:** Zervos, Marcus  
**Subject:** RE: Response to Eden's most recent email

Ok. So you're good with email. Does it go far enough?

**From:** Zervos, Marcus [mailto:MZERVOS1@hfhs.org]  
**Sent:** Saturday, October 29, 2016 11:04 AM  
**To:** Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>; Matthew Seeger <matthew.seeger@wayne.edu>; Paul Evan Kilgore <paul.kilgore@wayne.edu>; Susan Masten <masten@egr.msu.edu>; Nancy Love <nglove@umich.edu>; Laura Sullivan (dr.laura2@gmail.com) <dr.laura2@gmail.com>; Benjamin Pauli (bpauli@kettering.edu) <bpauli@kettering.edu>; Joanne Sobeck <ab1350@wayne.edu>; Sammy Zahran <Sammy.Zahran@colostate.edu>  
**Subject:** RE: Response to Eden's most recent email

Shawn you have my thoughts on response to her,

**From:** Shawn Patrick McElmurry [mailto:s.mcelmurry@wayne.edu]  
**Sent:** Saturday, October 29, 2016 10:50 AM  
**To:** Matthew Seeger <matthew.seeger@wayne.edu>; Paul Evan Kilgore <paul.kilgore@wayne.edu>; Zervos, Marcus <MZERVOS1@hfhs.org>; Susan Masten <masten@egr.msu.edu>; Nancy Love <nglove@umich.edu>; Laura Sullivan (dr.laura2@gmail.com) <dr.laura2@gmail.com>; Benjamin Pauli (bpauli@kettering.edu) <bpauli@kettering.edu>; Joanne Sobeck <ab1350@wayne.edu>; Sammy Zahran <Sammy.Zahran@colostate.edu>  
**Subject:** Response to Eden's most recent email  
**Importance:** High

All, I apologize for bringin all of you into this conversation but I would like the collective insight of our lead investigators. As many of you know, last Friday Matt, Mark, Paul and I were subjected to an emergency conference call with MDHHS representatives at the bequest of Eden Wells. This was the latest in a series of demands/inquiries from the state that have been increasing over the last few weeks. Below is the latest email from Eden.

I feel the need to push back on this. It is becoming extremely difficult to do anything but respond to her demands. I am not opposed to finding ways to share data more rapidly as long as it is done simultaneously with other partners (including residents!).

After reading the email below, please review the attached draft response. While I REALLY need to spend some time with my family tomorrow, I could discuss via phone today if interested.

Thanks for your guidance.

Shawn

**From:** Wells, Eden (DHHS) [mailto:WellsE3@michigan.gov]  
**Sent:** Saturday, October 29, 2016 8:47 AM  
**To:** Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>  
**Cc:** LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; Paul Evan Kilgore <paul.kilgore@wayne.edu>; Matthew Seeger <matthew.seeger@wayne.edu>; MZERVOS1@hfhs.org; Horste, Ian (DHHS) <Horstel@michigan.gov>; Moran, Susan

(DHHS) <MoranS@michigan.gov>; Waggoner, Carrie (DHHS) <WaggonerC@michigan.gov>; Rockefeller, Cheryl (DHHS) <RockefellerC@michigan.gov>; Hanley, Farah (DHHS) <hanleyf@michigan.gov>  
Subject: Re: 3 PM Draft Agenda

Good morning,

Per our call last Friday, this absolutely does have IRB ramifications, which is why we had the call. The individual and public health ramifications of your study, which became apparent immediately at the time of your press release must be addressed immediately.

This was the agreement per our call. The addendum to the contract will refer to the update required in your study protocol, which needs to be submitted to MDHHS IRB, and which must address the timely manner in which individual houses are identified and reported in a timely manner to Public Health, City, DEQ and EPA, should a health risk be determined by your study.

There are no ramifications regarding the data use agreement as your household study is not part of any data use agreement with our Department.

This cannot await a discussion on November 4. One of the outcomes of the call is that you stated that you will be able to revise the protocol to allow timely household identification should you identify a health threat, that all were going to think about how best to do this over last weekend, and that you were going to address this early last week.

Given that this does have IRB ramifications should highlight the urgency of this matter, as the IRB assures the health and safety of study participants. The addendum/ adjustment to the protocol should be addressed urgently by FACHEP.

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

On Oct 28, 2016, at 9:14 PM, Shawn Patrick McElmurry <s.mcelmurry@wayne.edu> wrote:

Eden, as you know amending the study protocol impacts the IRB, DUA, and other aspects of our project. This is something that apparently needs to be discussed further.

I believe we have FWICC Friday (11/4). How about meeting in person prior to FWICC to discuss?

Shawn

From: Wells, Eden (DHHS) [mailto:WellsE3@michigan.gov]  
Sent: Friday, October 28, 2016 3:32 PM  
To: Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>  
Cc: LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; Paul Evan Kilgore <paul.kilgore@wayne.edu>; Matthew Seeger <matthew.seeger@wayne.edu>; MZERVOS1@hfhs.org; Horste, Ian (DHHS) <Horstel@michigan.gov>; Moran, Susan (DHHS) <MoranS@michigan.gov>; Waggoner, Carrie (DHHS) <WaggonerC@michigan.gov>; Rockefeller, Cheryl (DHHS) <RockefellerC@michigan.gov>; Hanley, Farah

**From:** Pressman, Jonathan [<mailto:Pressman.Jonathan@epa.gov>]  
**Sent:** Monday, October 31, 2016 9:35 AM  
**To:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Wells, Eden (DHHS) ([WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; [jmcd@cityofflint.com](mailto:jmcd@cityofflint.com); James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us)) <[jhenry@gchd.us](mailto:jhenry@gchd.us)>; Krisztian, George (DEQ) <[krisztian@michigan.gov](mailto:krisztian@michigan.gov)>; Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Mark Adas <[madas@cityofflint.com](mailto:madas@cityofflint.com)>; Benzie, Richard (DEQ) <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>; [feighner@michigan.gov](mailto:feighner@michigan.gov); Robert Bincsik <[rbincsik@cityofflint.com](mailto:rbincsik@cityofflint.com)>; John Monsees <[jmonsees@cityofflint.com](mailto:jmonsees@cityofflint.com)>; Dugan, Alison <[Dugan.Alison@epa.gov](mailto:Dugan.Alison@epa.gov)>; Alexander, Matthew <[Alexander.Matthew@epa.gov](mailto:Alexander.Matthew@epa.gov)>  
**Cc:** Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>  
**Subject:** RE: FACHEP Free chlorine levels

All

Last week, a team from Flint, MDEQ, and EPA investigated chlorine residuals at some of the low sites (and one high site) previously reported by FACHEP. See attached spreadsheet with chlorine residuals taken from hydrants closest to the rounded addresses supplied by FACHEP. In the second attachment, I have highlighted the same locations for comparison. The lowest free chlorine measured last week was 0.61mg/L.

There are multiple potential explanations for these results, however, the primary confounding factor is that more than a month passed between the sampling dates. Therefore, it is difficult to investigate with any further detail the extent of low chlorine in those homes reported by FACHEP, particularly without the exact addresses and interest of residents for follow-up by the water utility.

It would be helpful in the future, when FACHEP samplers encounter low chlorine residuals in homes after flushing, to notify the Flint Water Utility on the same day the low chlorine results are detected and to inquire with residents for permission for Water Utility staff to follow-up with the residents. In this way, as a public/private partnership, all involved can participate in understanding the root cause and developing solutions to protect public health.

Regards  
Jonathan

Jonathan Pressman, Ph.D., P.E.  
U.S. Environmental Protection Agency  
Water Supply & Water Resources Division  
National Risk Management Research Laboratory  
26 West Martin Luther King Drive (msG75)  
Cincinnati, Ohio 45268  
Phone: (513) 569-7625  
Fax: (513) 487-2543  
[pressman.jonathan@epa.gov](mailto:pressman.jonathan@epa.gov)

**From:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**Sent:** Thursday, November 03, 2016 12:52 AM  
**To:** Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>  
**Cc:** Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Robert Bincsik <[rbincsik@cityofflint.com](mailto:rbincsik@cityofflint.com)>; Wells, Eden (DHHS) ([WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; [jmcdday@cityofflint.com](mailto:jmcdday@cityofflint.com); James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us)) <[jhenry@gchd.us](mailto:jhenry@gchd.us)>; Krisztian, George (DEQ <[krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)>; Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Mark Adas <[madas@cityofflint.com](mailto:madas@cityofflint.com)>; Benzie, Richard (DEQ <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>; [feighnerb@michigan.gov](mailto:feighnerb@michigan.gov); John Monsees <[jmonsees@cityofflint.com](mailto:jmonsees@cityofflint.com)>; Dugan, Alison <[Dugan.Alison@epa.gov](mailto:Dugan.Alison@epa.gov)>; Alexander, Matthew <[Alexander.Matthew@epa.gov](mailto:Alexander.Matthew@epa.gov)>; Paul Evan Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>  
**Subject:** RE: FACHEP Free chlorine levels

Hey Jonathan, thanks for the follow up. I appreciate the challenge this posed given the lag in data. Unfortunately, this data was never intended to be used in a timely matter. We are working to update our procedures to more easily share the location data and reduce the delay.

Shawn

## Shawn McElmurry

---

**From:** Shawn Patrick McElmurry  
**Sent:** Friday, November 04, 2016 10:07 AM  
**To:** Matthew Seeger; Paul Evan Kilgore  
**Subject:** FW: Response

FYI

**From:** Laura Sullivan [mailto:dr.laura2@gmail.com]  
**Sent:** Friday, November 4, 2016 8:41 AM  
**To:** Nancy Love <nglove@umich.edu>; Terese Olson <tmolson@umich.edu>; Shawn Patrick McElmurry <s.mcelmurry@wayne.edu>  
**Subject:** Response

Nancy, Terri, and Shawn,

In reference to the community recovery meeting last night, these are the statements I recall:

Mark Durno shared that levels of residual Chlorine in the system were stabilizing, with a few worry spots that the EPA continues to monitor

Someone else from EPA said that Chlorine was being measured in individual homes. The last time the Chlorine was tested in these homes, some houses had levels below .2

Eden stated that all water has some bacteria in it. She asked Mark to confirm that E Coli and Coliform bacteria testing in the system came back negative, and he said that E. coli was negative but not coliform bacteria, which she explained to the audience was just bacteria in our gut.

Eden stated that researchers at UM Ann Arbor were looking to see if there was bacteria in the water in Ann Arbor and Flint. She noted that I was participating in the UM study and she invited me to chime in.

Many residents raised concerns about bacteria. One or two asked about filter use, including how often they should replace filters. Eden and the EPA person who had spoken about Chlorine levels in homes described how the indicator light worked and that residents should follow manufacturer instructions.

Residents asked about hot water and its effect on the filters. They asked if the indicator light would change if they'd accidentally used warm water. They were told it would not.

I had been standing, because Eden had noted that I was part of the team working with Dr. Love on looking to see if bacteria showed up in the water. My opportunity to speak followed concerns raised by many regarding Chlorine and bacteria. I heard residents talking about the cartridge box saying that the filter should not be used for water that doesn't have adequate disinfectant.

I said that filters were being proven by numerous researchers to be very effective in removing lead, even at high levels, and that it was important to continue using them to filter lead. I noted that this is what they're designed to do. I noted that the box indicates that they shouldn't be used in places with insufficient disinfection. I clarified that people should continue to use them for lead, but that they might want to consider changing filters more frequently and/or boiling the filtered water, if the Chlorine levels were low.



I asked if residents could be supplied with equipment that would give them the opportunity to test Chlorine level in their home, so that they could have more information which to make decisions about how to treat their water after it had been filtered.

I said that in some homes the team had found the presence of bacteria at levels that were much higher than would be expected, and that these levels wouldn't be expected in a healthy water system. I said that this is why residents need tools to help them make decisions about how to treat and use their water.

--  
Laura L. Sullivan, Ph. D.  
3101 Hawthorne Drive  
Flint, Michigan 48503  
[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)

Human(kind). Be both.



Shawn McElmurry

From: Shawn  
Sent: Thursday, November 24, 2016 2:31 PM  
To: Benjamin Pauli  
Subject: RE: FW: University Study and Legionnaire's Disease

Oh man, sounds like fun! being a dad is amazing...for many reasons☺ I hope your little ninja feels better. cheers!

Shawn P. McElmurry, PhD, PE  
Associate Professor  
Wayne State University

----- Original message -----

From: Benjamin Pauli <bpauli@kettering.edu>  
Date: 11/24/16 10:29 AM (GMT-05:00)  
To: Nancy Love <nglove@umich.edu>, Shawn McElmurry <s.mcelmurry@wayne.edu>, "Zervos, Marcus" <MZERVOS1@hfhs.org>  
Cc: Joanne Sobeck <ab1350@wayne.edu>, Laura Sullivan <dr.laura2@gmail.com>, Matthew Seeger <matthew.seeger@wayne.edu>, Paul Kilgore <paul.kilgore@wayne.edu>, Susan Masten <masten@egr.msu.edu>  
Subject: Re: FW: University Study and Legionnaire's Disease

I'd like to echo everyone's sentiments about being grateful to be a part of the team. Of all the people and groups that are doing or have done testing in Flint, I think our team stands out for demonstrating that a commitment to the residents need not preclude a commitment to good science, and vice versa.

So far Thanksgiving has consisted of nursing a sick kid who refuses to take a shower even after he's puked on himself. I am jealous of you, Nancy – I spent a couple days in Panajachel back in February 2006. Lake Atitlan is indeed beautiful! Have a good time...

On Thu, Nov 24, 2016 at 9:15 AM Zervos, Marcus <MZERVOS1@hfhs.org> wrote:

Happy Thanksgiving, I am very thankful to be working with all of you, we do have a very unique, great team, Mark

From: Nancy Love [mailto:nglove@umich.edu]  
Sent: Thursday, November 24, 2016 8:57 AM  
To: Shawn McElmurry  
Cc: Laura Sullivan; Benjamin Pauli (bpauli@kettering.edu); Joanne Sobeck; Zervos, Marcus; Matthew Seeger; Paul Kilgore; Susan Masten

Subject: Re: FW: University Study and Legionnaire's Disease

Happy thanksgiving everyone! Also thankful to be working with such a great and dedicated team.

Off to a tour of cemeteries and local churches today. Have some great photos of volcanoes and Lake Atitlan area to share.

Nancy

On Thursday, November 24, 2016, Shawn McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)> wrote:

The first email I received was from Bryce.

Off to the Thanksgiving Day parade! I'm certainly grateful to be working with all of you. Have a great holiday all!

Shawn

Ps. Yes, I'm very happy I decided to not provided identifiable information in my email.

**From:** Laura Sullivan [mailto:[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)]

**Sent:** Thursday, November 24, 2016 7:35 AM

**To:** Benjamin Pauli ([bpauli@kettering.edu](mailto:bpauli@kettering.edu)) <[bpauli@kettering.edu](mailto:bpauli@kettering.edu)>; Joanne Sobeck <[ab1350@wayne.edu](mailto:ab1350@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>; Paul Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Shawn McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>

**Subject:** Re: FW: University Study and Legionnaire's Disease

Did JoLisa include you in the list of recipients when she sent her email regarding this test outcome? Did she share the list of recipients?

L

On Wed, Nov 23, 2016 at 7:05 PM Shawn McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)> wrote:

Just want you all to be aware of the response of me sharing a result from one resident Eden, Jim and Pam earlier today.

Have a happy thanksgiving!

Shawn

**From:** Feighner, Bryce (DEQ) [mailto:FEIGHNERB@michigan.gov]  
**Sent:** Wednesday, November 23, 2016 6:07 PM  
**To:** JoLisa McDay <jmcday@cityofflint.com>  
**Cc:** Mark Durno <durno.mark@epa.gov>; Thomas Speth <Speth.Thomas@epa.gov>; Mark Valacak <mvalacak@gchd.us>; Robert Bincsik <rbincsik@cityofflint.com>; Mark Adas <madas@cityofflint.com>; Wells, Eden (DHHS) <WellsE3@michigan.gov>; Creagh, Keith (DNR) <creaghk@michigan.gov>; Krisztian, George (DEQ) <krisztian@michigan.gov>; Benzie, Richard (DEQ) <BENZIER@michigan.gov>; Shawn McElmurry <s.mcelmurry@wayne.edu>  
**Subject:** Re: University Study and Legionnaire's Disease

Hi JoLisa, Did you get the sample result from WSU or the resident?

Shawn, Is a confirmation sample planned? Do we know the status of interior plumbing? Water use? Advice given to homeowner beyond what is on the sample result? The chlorine residual result does not make sense, particularly if the water use is not high, as it is higher than the residual leaving the application points. Perhaps call me later this evening?

Thanks. Bryce

517-652-1580

Sent from my iPhone

On Nov 23, 2016, at 5:38 PM, JoLisa McDay <jmcday@cityofflint.com> wrote:

Good evening to all,

Please be advised that the following attachment indicates the detection of legionella in a shower fixture at a home in Flint.

The City of Flint WTP does not know how or who collected the samples. I would appreciate support in evaluating the area for susceptibility. I am also requesting support for improving communication on Legionnaire's to the community.

Regards,  
JoLisa McDay

<FACHEP\_Legionella\_Analysis\_Report\_Letter-POS\_V5\_\_MERGED\_Sent20161114\_SITEID-90405.pdf>

Nancy G. Love, Ph.D., P.E., BCEE

Borchardt and Glysson Collegiate Professor

Department of Civil and Environmental Engineering, University of Michigan

Adjunct Professor, Addis Ababa University Institute of Biotechnology, Ethiopia

Fellow: Water Environment Federation; International Water Association; Association of Environmental Engineering and Science Professors

183 EWRE Building  
1351 Beal Avenue  
Ann Arbor, MI 48109

Voice: (734) 763-9664

[nglove@umich.edu](mailto:nglove@umich.edu)

<http://envbiotech.engin.umich.edu/>

Twitter: @Love\_H20

Attend the AEESP2017 Conference on Advancing Healthy Communities

June 20-22, 2017, Ann Arbor Michigan

Abstracts due: January 9, 2017

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**From:** [Wells, Eden \(DHHS\)](#)  
**To:** [Lyon, Nick \(DHHS\)](#)  
**Cc:** [Vreibel, Nancy \(DHHS\)](#)  
**Subject:** Fwd: University Study and Legionnaire's Disease  
**Date:** Wednesday, November 23, 2016 6:51:19 PM

---

Nick-

FYI, as Keith pulled in on email chain, but homeowners getting letters about Legionnaire's in their homes call EPA or the City with questions, so FACHEP's communications plan needs some work... we will meet with them this next week. They are already delayed in supplying some updated protocols, so i may need to talk to Jessica and Farah early next week as wel.

---

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services  
Tel: 517-284-4020

Sent from my iPhone, please excuse typos

Begin forwarded message:

**From:** "Feighner, Bryce (DEQ)" <[FEIGHNERB@michigan.gov](mailto:FEIGHNERB@michigan.gov)>  
**Date:** November 23, 2016 at 6:07:05 PM EST  
**To:** JoLisa McDay <[jmcday@cityofflint.com](mailto:jmcday@cityofflint.com)>  
**Cc:** Mark Durno <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>, Thomas Speth <[Speth.Thomas@epa.gov](mailto:Speth.Thomas@epa.gov)>, Mark Valacak <[mvalacak@gchd.us](mailto:mvalacak@gchd.us)>, Robert Bincsik <[rbincsik@cityofflint.com](mailto:rbincsik@cityofflint.com)>, Mark Adas <[madas@cityofflint.com](mailto:madas@cityofflint.com)>, "Wells, Eden (DHHS)" <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>, "Creagh, Keith (DNR)" <[creaghk@michigan.gov](mailto:creaghk@michigan.gov)>, "Krisztian, George (DEQ)" <[krisztian@michigan.gov](mailto:krisztian@michigan.gov)>, "Benzie, Richard (DEQ)" <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>, Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**Subject:** Re: University Study and Legionnaire's Disease

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Shawn, Is a confirmation sample planned? Do we know the status of interior plumbing? Water use? Advice given to homeowner beyond what is on the sample result? The chlorine residual result does not make sense, particularly if the water use is not high, as It is higher than the residual leaving the application points. Perhaps call me later this evening?

Thanks. Bryce  
517-652-1580

Sent from my iPhone

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The City of Flint WTP does not know how or who collected the samples. I would appreciate support in evaluating the area for susceptibility. I am also requesting support for improving communication on Legionnaire's to the community.

Regards,  
JoLisa McDay

<FACHEP\_Legionella\_Analysis\_Report\_Letter-  
POS\_V5\_\_MERGED\_Sent20161114\_SITEID-90405.pdf>

Exemplary Wayne State FOIA redaction to protect McElmurry's "intellectual property." See next page for corresponding EPA FOIA illustrating attempts to hide McElmurry's inexplicable and disruptive low chlorine alerts.

**From:** Shawn McElmurry  
**Sent:** Tuesday, November 29, 2016 9:28 PM  
**To:** Matthew Seeger  
**Subject:** RE: Low Chlorine Levels Observed [REDACTED]

They are going to love me.

**From:** Matthew Seeger  
**Sent:** Tuesday, November 29, 2016 9:03 PM  
**To:** Shawn McElmurry <s.mcelmurry@wayne.edu>  
**Subject:** Re: Low Chlorine Levels Observed [REDACTED]

Wow.

**From:** Shawn McElmurry  
**Date:** Tuesday, November 29, 2016 at 9:01 PM  
**To:** "Wells, Eden (DHHS) (WellsE3@michigan.gov)", JoLisa McDay, Pamela Pugh, "James Henry (jhenry@gchd.us)", "Feighner, Bryce (DEO)", Mark Durno, "Pressman, Jonathan"  
**Cc:** Paul Kilgore, Marcus Zervos, Matt Seeger, Nancy Love, Susan Masten, "Laura Sullivan (dr.laura2@gmail.com)", "Benjamin Pauli (bpauli@kettering.edu)"  
**Subject:** Low Chlorine Levels Observed on [REDACTED]

All, I want to inform you that on [REDACTED] we collected water samples from two residents in [REDACTED]  
[REDACTED]  
[REDACTED]

Shawn

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering  
2158 Engineering Building  
5050 Anthony Wayne Dr.  
Detroit, Michigan 48202  
Phone: 313-577-3876  
Fax: 313-577-3881  
Skype: s.mcelmurry  
[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)



**From:** Shawn McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>  
**Sent:** Tuesday, November 29, 2016 9:01 PM  
**To:** Wells, Eden (DHHS) ([WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)>; JoLisa McDay <[jmcdday@cityofflint.com](mailto:jmcdday@cityofflint.com)>; Pamela Pugh <[ppugh@cityofflint.com](mailto:ppugh@cityofflint.com)>; James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us)) <[jhenry@gchd.us](mailto:jhenry@gchd.us)>; [feighnerb@michigan.gov](mailto:feighnerb@michigan.gov); Durno, Mark <[durno.mark@epa.gov](mailto:durno.mark@epa.gov)>; Pressman, Jonathan <[Pressman.Jonathan@epa.gov](mailto:Pressman.Jonathan@epa.gov)>  
**Cc:** Paul Kilgore <[paul.kilgore@wayne.edu](mailto:paul.kilgore@wayne.edu)>; Marcus Zervos <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)>; Matthew Seeger <[matthew.seeger@wayne.edu](mailto:matthew.seeger@wayne.edu)>; Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>; Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>; Laura Sullivan ([dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)) <[dr.laura2@gmail.com](mailto:dr.laura2@gmail.com)>; Benjamin Pauli ([bpauli@kettering.edu](mailto:bpauli@kettering.edu)) <[bpauli@kettering.edu](mailto:bpauli@kettering.edu)>  
**Subject:** Low Chlorine Levels Observed on Nov. 28th

All, I want to inform you that on Nov. 28<sup>th</sup> (yesterday) we collected water samples from two residents in the Sunset Village apartment complex. We were unable to measure chlorine (ND for one, 0.04 mg/L for the other) in the cold water at the kitchen tap after 5 minutes of flushing in either home. These sample were collected while bypassing the filters. According to our protocol, we also collected a sample for e.coli; I do not have the results of this test yet.

Shawn

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering  
2158 Engineering Building  
5050 Anthony Wayne Dr.  
Detroit, Michigan 48202  
Phone: 313-577-3876  
Fax: 313-577-3881  
Skype: s.mcelmurry  
[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)

**Subject:**Chlorine residual requirements by state  
**Date:**Thu, 8 Dec 2016 20:50:23 -0500  
**From:**Susan J. Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>  
**To:**Nancy Love <[nglove@umich.edu](mailto:nglove@umich.edu)>, Shawn Patrick McElmurry <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)>, Susan Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)>

## State Disinfectant Residual Requirements

Sta	Distribution System Residual	Details about Monitoring, Compliance	Regulation Citations
EPA	SW - detectable residual or HPC ≤	95% of samples. Detectable is not defined.	40 CFR § 141.72 (2015)
Alabama	0.2 (free), 0.5 (total)	Daily monitoring. If < 0.2 more than 4 hours, TT violation & PN within 14 days. If < 0.2 more than 24 hours, bacteria	Ala. Admin. Code r. 335-7-10-.04 (2014)
Colorado	0.2 (free or total)	Measured at TCR sites. Based on # samples - 95%, more than	5 Colo. Code Regs. § 1002-11,
Delaware	0.3 (free)	Maintain throughout distribution system, daily monitoring at TCR sites, defines detectable as 0.04	16 Del. Admin. Code § 4462-8.2 (2015)
Florida	0.2 (free), 0.6 (total)	Maintain at all times. Two or five samples per week based on pop. If < min. residual, increase dose and flush until	Fla. Admin. Code Ann. r. 62-555.350(6) (2015)
Georgia	0.2 (free)	Maintain in all locations.	Ga. Comp. R. & Regs. r. 391-3-5-
Illinois	0.2 (free), 0.5 (total)	Maintain in all locations. Monitor at frequent and regular	Ill. Adm. Code tit. 35 § 653.604
Indiana	0.2 (free), 0.5 (total)	Defines detectable as 0.2 free or 0.5 total. 95% of samples.	327 Ind. Admin. Code 8-2-1(98)
Iowa	0.3 (free), 1.5 (total)	Measured at TCR sites. Continuously maintained throughout DS except at dead ends. Defines detectable as 0.1.	Iowa Admin. Code r. 567-42.4(3) (2015)
Kansas	0.2 (free), 1.0 (total)	Daily monitoring. 95% of samples.	Kan. Admin. Regs. § 28-15-19
Kentucky	0.2 (free), 0.5 (total)	Daily monitoring. Maintain throughout distribution system.	401 Ky. Admin. Regs. 8:150
Louisiana	0.5 (free or total)	Daily at MRT sites, at TCR sample sites, and at 25% more	La. Admin. Code. Tit 41, § 524,
Minnesota	0.1 (free or total)	Requires a detectable residual and defines detectable as 0.1.	Minn. R. 4720.3965 (2015) & Minn. R. 4720.0450
Missouri	0.2 (total)	Measured at TCR sites. 95% of samples.	Mo. Code. Regs. tit. 10 § 60-
Nebraska	SW - 0.2 (free), 0.25 or 0.5	95% of samples.	179 Neb. Admin. Code 13-005.01D1
Nevada	0.05 mg/L (free or total)	Requires a detectable residual and defines detectable as	Nev. Admin. Code. § 445A.6683
New Jersey	0.05 mg/L (free or total)	Requires a detectable residual and defines detectable as	N.J. Admin. Code § 7:10-11.16 &
North	0.2 (free), 1.0 (total)	Measured at TCR sites. Must be detectable at MRT sites.	15 N.C. Admin. Code 18C.2002
Ohio	0.2 (free), 1.0 (total)	Measured at TCR sites. 95% of samples.	Ohio Admin. Code 3745-81-72 & 3745-
Oklahoma	0.2 (free), 1.0 (total)	Maintain at most distant points.	Okla. Admin. Code § 252:631-3-3
Pennsylvania	Proposed: 0.20 mg/L (free or total)	Proposed: 95% of samples, monitor daily or weekly, 5% OOC	25 Pa. Code. § 109.710 & 109.301
Tennessee	0.2 (free)	Monitor at TCR sites. 95% of samples.	Tenn. Comp. R. & Regs. 0400-45-01-
Texas	0.2 (free), 0.5 (total)	Daily or weekly monitoring based on pop. 95% of samples.	30 Tex. Admin. Code §290.110
Vermont	0.1 (free)	Maintain at distant points and defines detectable as 0.1.	12-030-003 Vt. Code. R. 21 (2015)
West	0.2 (total)	Minimum at all points.	64CSR77, 6.4.c

Source: Compiled by Pennsylvania DEP, June 2015

### Industry Standards:

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2012 Edition,  
Recommended Standards for Waterworks (Ten States Standards):

- Minimum free chlorine residual in a water distribution system should be 0.2 mg/L.
- Minimum chloramine residual, where chloramination is practiced, should be 1.0 mg/L at distant points in the distribution system.
- Higher residuals may be required depending on pH, temperature and other characteristics of the water.

### Water Research Foundation, 2010, Criteria for Optimized Distribution Systems:

- Chlorine residual in 95% of measurements:
  - Free chlorine  $\geq$  0.20 mg/L
  - Total chlorine  $\geq$  0.50 mg/L

On Mar 4, 2017, at 12:48 AM, Zervos, Marcus  
<[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)> wrote:

March 3, 2017

To Eden Wells, MD, MPH, FACPM:

This letter is a response to issues that have been raised regarding the FACHEP investigation of Legionnaires Disease in Flint. The comments expressed are solely my own and do not necessarily reflect those of Henry Ford Health System, Wayne State University, other FACHEP investigators, or investigators in Flint and their institutions.

When I agreed to become part of this effort it was, as you know, in response to a request from Governor Snyder's office that FACHEP independently examine the relationship of the change of water in Flint and Legionnaires Disease. My interest in becoming involved was to do research that would inform the public health, using my thirty-plus years as an infectious disease physician, hospital epidemiologist and researcher to ultimately improve the health of the people of Flint and other communities. The effort has unique potential for major academic institutions in Michigan to partner with the health departments toward mutual goals. In my years of practice as an academic infectious disease physician, I have worked with many groups including local, national

and international health departments. This is the first time, however, that I have experienced such failure of process leading to inhibition and attempts to control independent, scientifically driven work; and limitations and restrictions on my ability to interact and partner with critical individuals and organizations. Specifically, the prohibition on access to and presentation of needed data; your disparaging, unfounded remarks such as those of your press releases of today; and limitations in scope of work is in stark contrast to what is required and reasonably expected in a successful collaboration.

Over the past months, you have made a number of assertions with which I strongly disagree. First, your position that FACHEP has not followed the protocol was preceded by funding cuts, limitations in needed scope of work, and by lack of access to information. The details of the protocol were worked out in an over 200 page document with MDHHS after months of discussion, delay and disagreements on scope. I would urge you to read the protocol carefully before you suggest that we are doing or asking for something that is not in the protocol. The disagreement on analysis of data, requests for information, ability to conduct needed scope of work and funding have been enumerated many times to MDHHS and will not be revisited in this letter.

Second, you objected to our wishes to inform the public and, surprisingly, the Mayor's office of our findings and its implications. We have an ethical and IRB-driven obligation to let our research subjects know the results of the testing in a timely manner. I feel that it is mandatory to act on available information, even if that information is incomplete, in a transparent disclosure, acting on the side of caution. For you to restrict the public health officer of Flint from hearing de-identified information of health importance to Flint is unacceptable.

Dr Wells, your comments to us at earlier meetings such as, "Do you know who is funding you?" or your more recent mandate to us to put a stop to the retrospective epidemiologic component of the project, can only be interpreted as a threat, and a clear attempt to influence our independent work and scientific integrity. Also, your accusations that FACHEP committed 'ethical violations' are outrageous, inflammatory, unfounded and unacceptable. The health departments charged with protecting the citizens of Flint should examine their own actions, or lack of action, for ethical violations.

I can only interpret your ongoing actions to disparage

our work as an attempt to suppress our findings of the serious deficiencies in the investigations and mitigation efforts by the health departments. Additionally, they can be viewed as an attempt to conceal information that should have been made public, and to prevent us from stating our position about the safety of the water in Flint or the consequences of the change in the source of Flint water that does not agree with your position.

It is notable that lead contaminated water in Flint might never have been brought to light had citizens not persisted in efforts to force local, state, and federal officials to take action. It is a social injustice that children were exposed to lead, and that it took so long to act on it. I, unfortunately, have found myself in the same position as these citizens in relation to what I know about Legionnaires or other issues of bacterial infections. The information on cases of Legionnaire's disease in Flint was kept from the public for months. Key parts of the investigation and mitigation strategies are still not done or, if done, have not been disclosed. The information that I do have, indicates that there has not been a proper investigation, making it impossible to determine whether or not current mitigation strategies are appropriate. This is not the way public health protection should work. The secrecy around many aspects of the investigation of Legionnaires and the lack of independent review of all data have resulted in significant distrust of the health department(s) by residents of Flint. We collectively do have the expertise, will and knowledge required to redress the current health issues in Genesee County. We know how people are exposed to legionella, how it damages health, and best management practices. The health department needs to act on information at hand without making excuses that more information is needed, suppressing information, and attempting to disparage or intimidate investigators. What is lacking is the moral and political will to do what should be done.

Sincerely,

Marcus Zervos, MD  
Division Head, Infectious Diseases  
Henry Ford Health System  
Professor of Medicine  
Wayne State University School of Medicine

On Mar 5, 2017, at 9:42 AM, Wells, Eden (DHHS) <[WellsE3@michigan.gov](mailto:WellsE3@michigan.gov)> wrote:

Dr. Zervos,

Regarding your thoughts that our concerns are unfounded, be aware I do have a copy of a text message (?Facebook) from a source, that will remain confidential and anonymous, but I would be glad to share the message content, that relates how you discussed with your PATIENT contractual issues of FACHEP's state funding--this is but one example of a number of the concerns that I am happy to discuss with your HFHS leadership and that of WSU.

My statement about reminding all of FACHEP members about the funding source is that academic grantees of any other funding source (NIH, HRSA, CDC, etc) would be more prompt in responding to requests for promised (by the PI) revised protocols, or, as any agency funded for doing research during current federal and state Public Health emergency response, exhibit more alacrity in responding to concerns by participating agencies.

As you recall, the transcription of that meeting where I mentioned above is in FACHEP members' possession, and I believe I still have the original recording.

Dr. McElmurray, I stand ready to share all available and well-documented materials with Dr. Lanier and any other participating FACHEP organizations. I cannot access his email on this current device; feel free to forward this message to Dr. Lanier.

Eden V. Wells, MD, MPH, FACPM  
Chief Medical Executive  
Michigan Department of Health and Human Services Tel:  
517-335-8024

On Mar 5, 2017, at 12:05 PM, Zervos, Marcus <[MZERVOS1@hfhs.org](mailto:MZERVOS1@hfhs.org)> wrote:

Dr Wells, this statement is both outrageous and unfounded. I don't know what you are referring to, but I have never spoken to a patient of mine or anyone else about anything that isn't public knowledge or related to information separate from the MDHHS contract and data use agreement. This is another example of your continuing attempts to intimidate me that I am not going to stand for. It is apparent that I cannot maintain any scientific or ethical integrity by continuing to work with you. I will make arrangements with the Henry Ford research office to terminate our subcontract with



WSU. I will however continue my efforts to work in Flint with other funding separate from MDHHS, as our work has had an important impact on helping the people of Flint. I will not communicate further with you on this except through our research and legal offices.

**From:** Wells, Eden (DHHS)

**Sent:** Sunday, March 05, 2017 2:08 PM

**To:** Zervos, Marcus <MZERVOS1@hfhs.org>

**Cc:** LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; Baird, Richard (GOV)

<bairdr@michigan.gov>; Shawn McElmurry <s.mcelmurry@wayne.edu>; Lyon, Nick (DHHS)

<LyonN2@michigan.gov>; Hay, Nancy <NHAY@hfhs.org>; LaPointe, Margot <MLaPoin1@hfhs.org>; Conway, William

<WCONWAY@hfhs.org>; Scher, Eric <ESCHER1@hfhs.org>; Linda Galante

<df0864@wayne.edu>; Mucha, John <JMUCHA@hfhs.org>; Stephen Lanier

<stephen.lanier@wayne.edu>

**Subject:** Re: response

Dr. Zervos- the text was sent to me by someone who did not know you but was concerned about your role with FACHEP. I agree that the person who wrote it could have been relating their knowledge within the activist community which is not been based from reported facts or media stories, this is true. It is consistent with one of the concerns I spoke to add. Lanier about Friday.

The reason for my email in response to you, sir, is not to intimidate but to state factually that we have documented materials to support the number of concerns we have with FACHEP as stated Friday-and I feel quite confident with the scientific and ethical integrity with which we have attempted to wrk with FACHEP.

This terminates out email discussions Sent from my iPhone,

please excuse typos Eden V. Wells, MD, MPH, FACPM

Chief Medical Executive

Michigan Department of Health and Human Services Tel: 517-335-8024

**From:** Shawn McElmurry <s.mcelmurry@wayne.edu>

**Sent:** Tuesday, July 25, 2017 9:07 PM

**To:** Robert Bincsik <rbincsik@cityofflint.com>

**Cc:** Krisztian, George (DEQ) <krisztiang@michigan.gov>; Pamela Pugh

<ppugh@cityofflint.com>; Lara Treemore-Spears <treemorespears@wayne.edu>; Durno, Mark

<durno.mark@epa.gov>; Paul Kilgore <paul.kilgore@wayne.edu>; LyonCallo, Sarah (DHHS)

<lyoncallos@michigan.gov>; James Henry (jhenry@gchd.us) <jhenry@gchd.us>

**Subject:** RE: Low Chlorine Levels Observed July 17, 19, and 24

Thank you Rob. It's hard for me to tell precisely if a Flint address falls inside/outside of the service area so I appreciate your assistance. I will forward to GC water.

Shawn

**From:** Robert Bincsik [<mailto:rbincsik@cityofflint.com>]

**Sent:** Tuesday, July 25, 2017 4:24 PM

**To:** Shawn McElmurry

**Cc:** George Krisztian ([krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)) ; Pamela Pugh ; Lara Treemore-Spears ;

Durno, Mark ; Paul Kilgore ; LyonCallo, Sarah (DHHS) ; James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us))

**Subject:** Re: Low Chlorine Levels Observed July 17, 19, and 24

McCollum and mill rd are not COF accounts.

On Jul 25, 2017 3:38 PM, "Shawn McElmurry" <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)> wrote:

We observed low free chlorine levels (<0.2 mg/L) at houses in the locations listed below. Note one home is outside of the City of Flint and I have therefore relayed this information to John Obrien from Genesee County Water & Waste.

The samples were collected from the kitchen sink after 5 minutes of flushing at the sink. The flushing followed the collection of multiple other samples elsewhere in the house. Below is the street address (rounded to protect participant identity), city, zip code, date sampled, and concentration observed.

3000 block of McCollum, Flint, 48504 (7/17/2017) – 0.142 mg/L  
3000 block of Mac Ave, Flint Township, 48506 (7/17/2017) – 0.194 mg/L  
3000 block of Hatherly Ave, Flint, 48504 (7/19/2017) – 0.169 mg/L  
2000 block of Mill Rd, Flint, 48532 (7/19/2017) – 0.025 mg/L  
3000 block of Concord St, Flint, 48504 (7/24/2017) – ND  
1000 block of W. Dartmouth, Flint, 48504 (7/24/2017) - ND

Per our protocol, we collected a sample that was sent off to be cultured for E.coli. I have not received the results of the E.coli test and I will notify you immediately if the tests come back positive.

Also, I just want to let you know, all past E.coli tests have thus far come back negative. Feel free to contact me if you have any questions.

Sincerely,  
Shawn McElmurry

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering  
2158 Engineering Building  
5050 Anthony Wayne Dr.  
Detroit, Michigan 48202  
Phone: 313-577-3876  
Fax: 313-577-3881  
Skype: s.mcelmurry  
[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)

**From:** Shawn McElmurry <s.mcelmurry@wayne.edu>  
**Sent:** Thursday, August 10, 2017 1:20 PM  
**To:** Robert Bincsik <rbincsik@cityofflint.com>  
**Cc:** Krisztian, George (DEQ) <krisztiang@michigan.gov>; Pamela Pugh <ppugh@cityofflint.com>; Lara Treemore-Spears <treemorespears@wayne.edu>; Durno, Mark <durno.mark@epa.gov>; Paul Kilgore <paul.kilgore@wayne.edu>; LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; James Henry (jhenry@gchd.us) <jhenry@gchd.us>  
**Subject:** RE: Low Chlorine Levels Observed Aug. 3-9, 2017

Ok. Thanks Rob. I will relay these values to Genesee County.

**From:** Robert Bincsik [<mailto:rbincsik@cityofflint.com>]  
**Sent:** Thursday, August 10, 2017 12:16 PM  
**To:** Shawn McElmurry  
**Cc:** George Krisztian ([krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)) ; Pamela Pugh ; Lara Treemore-Spears ; Durno, Mark ; Paul Kilgore ; LyonCallo, Sarah (DHHS) ; James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us))  
**Subject:** Re: Low Chlorine Levels Observed Aug. 3-9, 2017

Shawn,  
After further investigation we don't service any of these addresses.

On Aug 10, 2017 11:57 AM, "Shawn McElmurry" <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)> wrote:

Hello again all. We have observed a few more low free chlorine levels (<0.2 mg/L) at houses in the locations listed below. Rob, if any of the Flint addresses are outside your distribution system it would be very helpful to know. Thank you!

The samples were collected from the kitchen sink after 5 minutes of flushing at the sink. The flushing followed the collection of multiple other samples elsewhere in the house. Below is the street address (rounded to protect participant identity), city, zip code, date sampled, and concentration observed.

3000 block of N. Term St Flint 48507, 0.140 mg/L (8/3/17)

3000 block of Devonshire, Flint 48505, 0.000 mg/L (8/5/17)

3300 block of S Kearsley Blvd, Flint 48506, 0.096 mg/L (8/9/17)

Per our protocol, we collected a sample that was sent off to be cultured for E.coli. I have not received the results of the E.coli test and I will notify you immediately if the tests come back positive. All previous E.coli tests have come back negative.

Feel free to contact me if you have any questions.

Thanks,  
Shawn

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering  
2158 Engineering Building  
5050 Anthony Wayne Dr.  
Detroit, Michigan 48202  
Phone: 313-577-3876  
Fax: 313-577-3881  
Skype: s.mcelmurry  
[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)

**From:** Shawn McElmurry <s.mcelmurry@wayne.edu>  
**Sent:** Tuesday, August 29, 2017 8:42 PM  
**To:** Robert Bincsik <rbincsik@cityofflint.com>  
**Cc:** Krisztian, George (DEQ) <krisztiang@michigan.gov>; Pamela Pugh <ppugh@cityofflint.com>; Lara Treemore-Spears <treemorespears@wayne.edu>; Durno, Mark <durno.mark@epa.gov>; Paul Kilgore <paul.kilgore@wayne.edu>; LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; James Henry (jhenry@gchd.us) <jhenry@gchd.us>  
**Subject:** RE: Low Chlorine Levels Observed Aug. 10-21, 2017

Shoot. Sorry Rob, typo on my part. It should have been:

3000 block of Comer St, Flint, MI 48506 (8/10/17) - 0.075 mg/L

I don't believe this is in Flint either, after looking it up on Google maps. I'll forward all but Race St. to GCWD.

Thanks,  
Shawn

**From:** Robert Bincsik [<mailto:rbincsik@cityofflint.com>]  
**Sent:** Tuesday, August 29, 2017 4:37 PM  
**To:** Shawn McElmurry  
**Cc:** George Krisztian ([krisztiang@michigan.gov](mailto:krisztiang@michigan.gov)) ; Pamela Pugh ; Lara Treemore-Spears ; Durno, Mark ; Paul Kilgore ; LyonCallo, Sarah (DHHS) ; James Henry ([jhenry@gchd.us](mailto:jhenry@gchd.us))  
**Subject:** Re: Low Chlorine Levels Observed Aug. 10-21, 2017

Shawn,  
Colmer isn't a good street per Google. The only one of these that's ours is Race st.

On Aug 28, 2017 4:56 PM, "Shawn McElmurry" <[s.mcelmurry@wayne.edu](mailto:s.mcelmurry@wayne.edu)> wrote:

Below is a list of locations where low free chlorine levels (<0.2 mg/L) at residents' taps were observed. Rob, if any of the Flint addresses are outside your distribution system it would be very helpful to know. Thank you!

The samples were collected from the kitchen sink after 5 minutes of flushing at the sink. The flushing followed the collection of multiple other samples elsewhere in the house. Below is the street address (rounded to protect participant identity), city, zip code, date sampled, and concentration observed.

3000 block of Raywood Ave\*, Flint, 48504 (8/10/17) - 0.075 mg/L

3000 block of Colmer Dr. Flint, 48507 (8/10/17) - 0.075 mg/L

3000 block of Race St., Flint 48504 (8/10/17) - 0.078 mg/L

5000 block of Kathy Dr., Flint, 48506 (8/14/2017) - 0.121 mg/L

2000 block of McCollum Ave., Flint, 48504 (8/16/17) - 0.059 mg/L

\* Note: Resident reports not being on Flint water.

Per our protocol, we collected a sample that was sent off to be cultured for *E.coli*. The sample collected on Raywood Ave did produce 1 colony forming unit per milliliter (CFU/mL) via the Petrifilm *E.coli*/coliform method. However, the coliform bacteria was NOT confirmed to be *Escherichia coli*. None the less, I am scheduled to resample this residents water tomorrow and will report the chlorine concentration as soon as I get back to my office. I still have not received the results of the E.coli test and I will notify you immediately if the tests come back positive. All other E.coli tests have come back negative.

Feel free to contact me if you have any questions.

Thanks,  
Shawn

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
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2158 Engineering Building  
5050 Anthony Wayne Dr.  
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Phone: 313-577-3876  
Fax: 313-577-3881  
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[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)

**From:** Shawn McElmurry <s.mcelmurry@wayne.edu>

**Sent:** Friday, September 1, 2017 2:20 PM

**To:** jfobrien@gcdcwws.com; jobrien@gcdcwws.com; mhorgan@gcdcwws.com; James Henry

(jhenry@gchd.us) <jhenry@gchd.us>; LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; Durno, Mark <durno.mark@epa.gov>; Krisztian, George (DEQ) <krisztiang@michigan.gov>  
**Cc:** Lara Treemore-Spears <treemorespears@wayne.edu>; Paul Kilgore <paul.kilgore@wayne.edu>; Nancy Love <nglove@umich.edu>  
**Subject:** RE: Update regarding Raywood Ave. Low Chlorine Sample  
**Importance:** High

As described in the email below, I collected two bacterial samples from the home on Raywood Ave on August 29<sup>th</sup>. One of the samples was submitted to Genesee County Health Department for *E.coli* (Colilert) and the other was submitted to Pathcon for *E.coli* (Petrifilm). While I do not have official results in writing, I was just informed of the outcome of these tests. A representative from Pathcon indicated that the sample they received was negative for *E. coli* as well as coliforms. Jim Henry informed me that the sample provided to GCHD **was positive for coliform**, but negative for *E. coli*. This is the second positive coliform sample collected at the house after flushing the tap water for more than 5 minutes.

I reported these results to the resident and advised her to boil her water until the safety of her water could be determined. The resident again gave me permission to share her contact information with the local water utility and health department. I provided this information to Jim Henry on Wednesday during a meeting with GCHD officials. I just got off the phone with Mark Horgan and relayed the latest results. I also provided Mark with the resident's contact information. Mark indicated his team measured the chlorine residual at a hydrant on the street after I notified him of our previous low chlorine measurements. The result of this test was 0.4 mg/L (color wheel). Based on these new results, Mark said he would follow up and will work to address the problem.

Sorry to relay this information the day before a holiday weekend but I wanted to provide the information as soon as it is available. If I can be of further assistance, please do not hesitate to contact me on my personal cell anytime (517-944-0996).

Sincerely,  
Shawn McElmurry

**From:** Shawn McElmurry <s.mcelmurry@wayne.edu>  
**Sent:** Monday, September 18, 2017 11:21 AM  
**To:** Mark Gaworecki <MFGaworecki@hengineers.com>  
**Cc:** Tidwell, Mayor (ltidwell@ecorsemi.gov) <ltidwell@ecorsemi.gov>; Paul Kilgore <paul.kilgore@wayne.edu>; Lara Treemore-Spears <treemorespears@wayne.edu>; Krisztian, George (DEQ) <krisztiang@michigan.gov>; LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; Mouhanad Hammami <mhammami@waynecounty.com>; Mary Lynn Semegen <Mary.Semegen@glwater.org>  
**Subject:** Low Chlorine Levels Observed in Ecorse - Sept. 1-14

Hello Mark, here is the latest list of locations in Ecorse where we observed low chlorine levels (<0.2 mg/L). Consistent with protocol, the samples were collected from the kitchen sink after 5 minutes of flushing at the sink. The flushing followed the collection of multiple other samples elsewhere in the house. Below is the street (address removed to protect participant identity), city, zip code, date sampled, and concentration observed.

3600 block of 12<sup>th</sup> Street, Ecorse, 48229 (9/7/17) - 0.173 mg/L  
4300 block of 7<sup>th</sup> Street, Ecorse, 48229 (9/7/17) - 0.078 mg/L  
4400 block of 10<sup>th</sup> Street, Ecorse, 48229 (9/14/17) - 0.156 mg/L

To put this in some context, we have collected approximately 76 samples from Wayne County, nearly all from Ecorse at this point. Per our protocol, we collected a sample that was sent off to be cultured for *E.coli*. I have not received the results of all *E.coli* tests and I will notify you immediately if the tests come back positive. All *E.coli* tests collected in Ecorse have come back negative thus far.

Feel free to contact me on my cell if you have any questions.

Thanks,  
Shawn

Shawn P. McElmurry, Ph.D., P.E.

Associate Professor  
Wayne State University  
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2158 Engineering Building  
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[www.eng.wayne.edu/mcelmurry](http://www.eng.wayne.edu/mcelmurry)

**From:** Shawn McElmurry <s.mcelmurry@wayne.edu>  
**Sent:** Wednesday, October 4, 2017 6:05 PM  
**To:** MBowdler@cityofriverrouge.org  
**Cc:** Paul Kilgore <paul.kilgore@wayne.edu>; Lara Treemore-Spears <treemorespears@wayne.edu>; Krisztian, George (DEQ) <krisztiang@michigan.gov>; LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; 'Mouhanad Hammami' <mhammami@waynecounty.com>; 'Mary Lynn Semegen' <Mary.Semegen@glwater.org>; kburke@cityofriverrouge.org; cbeaudrie@cityofriverrouge.org  
**Subject:** Low Chlorine Level Observed in River Rouge - Sept. 19-28

Hello Mayor Bowdler. I wanted to let you know that during the last two weeks we observed low chlorine levels (<0.2 mg/L) in the following locations.

The sample we measured the low chlorine level in was collected from the kitchen sink after 5 minutes of flushing at the sink. The flushing followed the collection of multiple other samples elsewhere in the house. Below is the street (address removed to protect participant identity), city, zip code, date sampled, and concentration for each of the low chlorine observations.

\*400 block of Lenoir Ct., River Rouge 48218 (9/19/2017) - 0.047 mg/L  
400 block of Lenoir Ct., River Rouge 48218 (9/19/2017) - 0.118 mg/L (this was a second home)  
W. Anchor St. between Division and W. Jefferson, River Rouge 48218 (9/19/2017) - Not Detected (ND)  
100 block of Walnut St., River Rouge 48218 (9/25/2017) - 0.187 mg/L  
500 block of Lenoir St., River Rouge, 48218 (9/27/2017) - ND  
300 block of Polk Ave., River Rouge, 48218 (9/27/2017) - 0.178 mg/L  
Leroy St. between Burke and Byron, River Rouge, 48218 (9/28/2017) - 0.111 mg/L  
Burke St. between Louis and W. Jefferson, River Rouge, 48218 (9/28/2017) - 0.171 mg/L  
400 block of Lenior, River Rouge, 48218 (9/28/2017) - 0.067 mg/L

Per our protocol, we collected a sample that was sent off to be cultured for E.coli. The location noted above with an asterisk contained was found to have coliform bacteria present at 4 CFU/mL but the test was negative for E. coli. I have contacted the resident and we are scheduling a time to resample the house to confirm results. Otherwise, I have not received the results of all other E.coli tests and I will notify you immediately if the tests come back positive.

Please note that I have copied Kelly Burke and Chris Beaudrie on this email. Please do not hesitate to contact me on my cell (517-944-0996) anytime if you have questions.

Thanks,  
Shawn

Shawn P. McElmurry, Ph.D., P.E.  
Associate Professor  
Wayne State University  
Dept. of Civil and Environmental Engineering  
2158 Engineering Building  
5050 Anthony Wayne Dr.  
Detroit, Michigan 48202  
Phone: 313-577-3876  
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On Sat, Oct 21, 2017 at 1:24 PM, Susan J. Masten <[masten@egr.msu.edu](mailto:masten@egr.msu.edu)> wrote:

Michele,

This is still factually incorrect. Chlorine residual is NOT the most widely measure of water quality. In fact, it is NOT a measure of water quality at all. It is a measure of the amount of disinfectant that remains in water. One can have a low chlorine residual and the water can be of excellent quality. One could have a high chlorine residual and the water could be of poor quality. It depends on demand, water age, pH, etc.

If you would like me to transfer my comments and changes to the version w/o track changes, I will do that. However, I need to do that at work with dual monitors not at home on my laptop. I'm unable to go into work today because of the home football game (we're locked out of buildings without prior permission).

Susan

On 10/21/2017 1:18 PM, Michele Swanson wrote:

Please read the version I emailed on Oct 12, which addressed the bulk of your concerns. For example, regarding boil water advisories, page 7 now states " In October 2015, the MDHHS and the Genesee County Health Department jointly announced a state of emergency and instructed residents to avoid drinking the water." In particular, please read this key section on page 5 that defines our usage of the term chlorine residual:

*"Changes in water quality marked by extended periods of low chlorine residual caused by the switch in water regime may have enabled legionellae growth (2-4). Residual chlorine is maintained in water distribution systems to inhibit the growth of pathogens, including Legionella pneumophila (5, 6). Free-living L. pneumophila are inactivated within 15 minutes of exposure to 0.4 mg Cl<sub>2</sub>/L (7). This pathogen also resides in biofilms attached to pipe walls and replicates within predatory free-living protozoa (8, 9), two habitats that require higher doses of chlorine to kill legionellae (10-12). To reduce the risk associated with bacterial growth in water distribution systems, regulatory agencies recommend a minimum free chlorine residual of 0.2 to 0.5 mg/L (13-15). The effectiveness of chlorine disinfection does have a complex relationship with solution chemistry; for example, iron and organic carbon can both consume chlorine and support L. pneumophila growth (16). However, because chlorine residual is the most widely reported measure of water quality within distribution systems, here we exploit chlorine residual values reported in Flint from 2013-2016 to investigate how changes in water quality were associated with the risk of LD."*

Thanks,  
M

Unchanged TEXT IN FINAL PNAS ARTICLE:


To reduce the risk associated with bacterial growth in water distribution systems, regulatory agencies recommend a minimum free chlorine residual of 0.2–0.5 mg/L ([15](#)–[17](#)).



41%3:25 PM

×

Would you help me Thank Shawn McElmurry for standing up for Flint during the Legionellea Outbreak in Flint. You Rock




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Carrie Younger-Nelson and 14 others



Tayna Givens


Thank you Shawn McElmurry!

4w

Like

Reply

2



Shawn McElmurry

Thank you **Quincy Murphy** for your hard work. All the credit goes to our flint crew (too many to name) that endured long hours, numerous delays in funding, and even...roosters! Without you and the hundreds of residents that allowed us to trample through thier homes and ask hundreds of questions, all of this would have been swept under the rug.. we are still working for you guys. More to come!

4w

Like

Reply

2



Write a comment...

GIF

