

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, January 09, 2015 8:23 AM  
**To:** Howes, Sarah (DEQ)  
**Cc:** prysbym@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** Flint Legislator Questions

Sarah,

I know Mike, Richard, and you met with Neeley and Phelps earlier this week, but we may want to check in with Senator Ananich's office, to see if they have any questions as well. See the article below.

[http://www.mlive.com/news/flint/index.ssf/2015/01/legislators\\_from\\_flint\\_want\\_st.html#incart\\_river](http://www.mlive.com/news/flint/index.ssf/2015/01/legislators_from_flint_want_st.html#incart_river)

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 21, 2015 8:41 AM  
**To:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); prysbym@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ)  
**Subject:** Flint Mayor request to Governor regarding Flint Water

FYI. Please see the link below. The mayor of Flint has requested the state provide assistance through a number of specific initiatives.

[http://www.mlive.com/news/flint/index.ssf/2015/01/flint\\_mayor\\_asks\\_governor\\_for.html](http://www.mlive.com/news/flint/index.ssf/2015/01/flint_mayor_asks_governor_for.html)

As we are scheduled to participate in the meeting in Flint this evening please let me know if we need to further discuss these requests.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, June 06, 2014 3:06 PM  
**To:** poy.thomas@epa.gov  
**Cc:** Crooks.Jennifer@epamail.epa.gov; prysbym@michigan.gov  
**Subject:** Flint MOR and Test Results  
**Attachments:** GENESEE-2014-05-27.pdf; GENESEE-2014-05-30.pdf; Flint04-2014MOR.pdf

Tom,

The April MOR you requested is attached along with the following test results sampled in May.

- TOC
- Metals
- VOC
- SOC (all 3 categories)
- Partial Chemistry

As the WTP only operated for the last few days in April the MOR results provide limited information. The Bacteriological Portion of the May Operating Period will be due next Tuesday 6/10, but the operational monitoring won't be reported until 6/30.

If you have any other questions, just let us know.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562

**Sample Number  
LF19431**

**Official Laboratory Report**

Report To: MICHAEL GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT - WATER PLANT        | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 4500 N DORT HWY, FLINT             | Source:         | TYPE I                       |
| Collected By:           | MICHAEL GLASGOW                    | Site Code:      | PS4                          |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 05/22/2014 08:30             |
| Sample Point:           | SINK                               | Date Received:  | 05/22/2014 13:20             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION  |                  |                | REGULATORY INFORMATION |                  |          |          |
|----------------------|------------------|----------------|------------------------|------------------|----------|----------|
| Analyte Name         | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method   | CAS #    |
| Total Organic Carbon | 4.57             | 05/22/2014     | 0.5                    |                  | SM 5310C | TOC-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian





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**Sample Number**  
**LF19432**

**Official Laboratory Report**

Report To: MICHAEL GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

System Name/Owner: CITY OF FLINT/ WATER PLANT  
Collection Address: 4500 N DORT HWY, FLINT  
Collected By: MICHAEL GLASGOW  
Township/Well#/Section: //  
County: Genesee  
Sample Point: SINK  
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310  
Source: TYPE I  
Site Code: RAW  
Collector: Public Water Supply Operator  
Date Collected: 05/22/2014 08:30  
Date Received: 05/22/2014 13:20  
Purpose: Routine Monitoring

| TESTING INFORMATION  |                  |                | REGULATORY INFORMATION |                  |          |          |
|----------------------|------------------|----------------|------------------------|------------------|----------|----------|
| Analyte Name         | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method   | CAS #    |
| Total Organic Carbon | 10.3             | 05/22/2014     | 0.5                    |                  | SM 5310C | TOC-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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Genesee County Health Dept.  
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mg/L : milligrams / Liter (ppm)  
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CFU : Colony Forming Unit

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FAX: (517) 335-8562

**Sample Number**  
**LF19430**

**Official Laboratory Report**

Report To: MICHAEL GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

System Name/Owner: CITY OF FLINT -WATER PLANT  
Collection Address: 4500 N DORT HWY, FLINT  
Collected By: MICHAEL GLASGOW  
Township/Well#/Section: //  
County: Genesee  
Sample Point: PLANT LAB TAP  
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310  
Source: TYPE I  
Site Code: LAB TAP  
Collector: Public Water Supply Operator  
Date Collected: 05/22/2014 08:30  
Date Received: 05/22/2014 13:19  
Purpose: Routine Monitoring

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                           |            |
|-------------------------------|---------------|-------------|------------------------|---------------|---------------------------|------------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method                    | CAS #      |
| Antimony                      | Not detected  | 05/23/2014  | 0.0006                 | 0.006         | EPA 200.8                 | 7440-36-0  |
| Arsenic                       | Not detected  | 05/23/2014  | 0.002                  | 0.010         | EPA 200.8                 | 7440-38-2  |
| Barium                        | 0.03          | 05/23/2014  | 0.01                   | 2             | EPA 200.8                 | 7440-39-3  |
| Beryllium                     | Not detected  | 05/23/2014  | 0.0004                 | 0.004         | EPA 200.8                 | 7440-41-7  |
| Cadmium                       | Not detected  | 05/23/2014  | 0.0003                 | 0.005         | EPA 200.8                 | 7440-43-9  |
| Chloride                      | 79            | 05/22/2014  | 4                      |               | SM 4500-Cl E              | 7647-14-5  |
| Chromium                      | Not detected  | 05/23/2014  | 0.01                   | 0.1           | EPA 200.8                 | 7440-47-3  |
| Cyanide-Available             | Not Detected  | 05/27/2014  | 0.02                   | 0.2           | OIA-1677                  | 57-12-5    |
| Fluoride                      | 0.16          | 05/22/2014  | 0.1                    | 4.0           | SM 4500 FC                | 16984-48-8 |
| Hardness as CaCO <sub>3</sub> | 209           | 05/22/2014  | 20                     |               | SM 2340 C                 | HARD-00-C  |
| Iron (automated)              | Not detected  | 05/22/2014  | 0.1                    |               | SM 3500 FeB               | 7439-89-6  |
| Lead                          | Not detected  | 05/23/2014  | 0.001                  | 0.015         | EPA 200.8                 | 7439-92-1  |
| Mercury                       | Not detected  | 05/23/2014  | 0.0001                 | 0.002         | EPA 200.8                 | 7439-97-6  |
| Nickel                        | Not detected  | 05/23/2014  | 0.01                   | 0.1           | EPA 200.8                 | 7440-02-0  |
| Nitrate as N                  | 0.4           | 05/22/2014  | 0.4                    | 10            | 10-107-04-2-B             | 14797-55-8 |
| Nitrite as N                  | Not detected  | 05/22/2014  | 0.05                   | 1             | 10-107-04-2-B             | 14797-65-0 |
| Selenium                      | Not Detected  | 05/23/2014  | 0.001                  | 0.05          | EPA 200.8                 | 7782-49-2  |
| Sodium (automated)            | 15            | 05/22/2014  | 5                      |               | SM 3500 NaB               | 7440-23-5  |
| Sulfate                       | 25            | 05/22/2014  | 10                     |               | SM 4500 SO <sub>4</sub> E | 14808-79-8 |
| Thallium                      | Not detected  | 05/23/2014  | 0.0002                 | 0.002         | EPA 200.8                 | 7440-28-0  |

**Carbamates by HPLC**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
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RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

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Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

**Sample Number**

**LF19430**

| TESTING INFORMATION                      |                  |                | REGULATORY INFORMATION |                  |           |            |
|------------------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                             | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Carbamates by HPLC</b>                |                  |                |                        |                  |           |            |
| 3 Hydroxycarbofuran                      | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 16655-82-6 |
| Aldicarb                                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 531.2 | 116-06-3   |
| Aldicarb sulfone                         | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 531.2 | 1646-88-4  |
| Aldicarb sulfoxide                       | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 531.2 | 1646-87-3  |
| Carbaryl                                 | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 63-25-2    |
| Carbofuran                               | Not Detected     | 05/27/2014     | 0.0005                 | 0.04             | EPA 531.2 | 1563-66-2  |
| Methiocarb                               | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 2032-65-7  |
| Methomyl                                 | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 16752-77-5 |
| Oxamyl                                   | Not Detected     | 05/27/2014     | 0.001                  | 0.2              | EPA 531.2 | 23135-22-0 |
| Propoxur                                 | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 114-26-1   |
| <b>Chlorinated Acid Herbicides</b>       |                  |                |                        |                  |           |            |
| 2,4,5-T                                  | Not Detected     | 05/23/2014     | 0.002                  |                  | EPA 515.4 | 93-76-5    |
| 2,4,5-TP (silvex)                        | Not Detected     | 05/23/2014     | 0.0003                 | 0.05             | EPA 515.4 | 93-72-1    |
| 2,4-D                                    | Not Detected     | 05/23/2014     | 0.002                  | 0.07             | EPA 515.4 | 94-75-7    |
| Acifluorfen                              | Not Detected     | 05/23/2014     | 0.004                  |                  | EPA 515.4 | 50594-66-6 |
| Bentazon                                 | Not Detected     | 05/23/2014     | 0.002                  |                  | EPA 515.4 | 25057-89-0 |
| Dicamba                                  | Not Detected     | 05/23/2014     | 0.002                  |                  | EPA 515.4 | 1918-00-9  |
| Dinoseb                                  | Not Detected     | 05/23/2014     | 0.0003                 | 0.007            | EPA 515.4 | 88-85-7    |
| Pentachlorophenol                        | Not Detected     | 05/23/2014     | 0.00006                | 0.001            | EPA 515.4 | 87-86-5    |
| Picloram                                 | Not Detected     | 05/23/2014     | 0.001                  | 0.5              | EPA 515.4 | 1918-02-1  |
| Total DCPA degradates, mono- and di-acid | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 515.4 | 1861-32-1  |
| <b>Pesticides Analysis by GC/MS</b>      |                  |                |                        |                  |           |            |
| 4,4'-DDD                                 | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 72-54-8    |
| 4,4'-DDE                                 | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 72-55-9    |
| 4,4'-DDT                                 | Not Detected     | 05/23/2014     | 0.0005                 |                  | EPA 525.2 | 50-29-3    |
| Acetochlor                               | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 34256-82-1 |
| Alachlor                                 | Not Detected     | 05/23/2014     | 0.0002                 | 0.002            | EPA 525.2 | 15972-60-8 |
| Aldrin                                   | Not Detected     | 05/23/2014     | 0.0004                 |                  | EPA 525.2 | 309-00-2   |
| alpha-Chlordane                          | Not Detected     | 05/23/2014     | 0.0002                 | 0.002            | EPA 525.2 | 5103-71-9  |
| Atrazine                                 | Not Detected     | 05/23/2014     | 0.0002                 | 0.003            | EPA 525.2 | 1912-24-9  |
| Dieldrin                                 | Not Detected     | 05/23/2014     | 0.0005                 |                  | EPA 525.2 | 60-57-1    |
| Endrin                                   | Not Detected     | 05/23/2014     | 0.0001                 | 0.002            | EPA 525.2 | 72-20-8    |
| Endrin aldehyde                          | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 7421-93-4  |
| gamma-Chlordane                          | Not Detected     | 05/23/2014     | 0.0002                 | 0.002            | EPA 525.2 | 5103-74-2  |
| Heptachlor                               | Not Detected     | 05/23/2014     | 0.0002                 | 0.0004           | EPA 525.2 | 76-44-8    |
| Heptachlor epoxide                       | Not Detected     | 05/23/2014     | 0.0001                 | 0.0002           | EPA 525.2 | 1024-57-3  |
| Hexachlorobenzene                        | Not Detected     | 05/23/2014     | 0.0001                 | 0.001            | EPA 525.2 | 118-74-1   |

CAS# : Chemical Abstract Service Registry Number

MCL : Maximum Contaminant Level

AL : Action Level

RL : Reporting Limit

mg/L : milligrams / Liter (ppm)

ppm : parts per million

MPN : Most Probable Number

CFU : Colony Forming Unit

Laboratory Contacts

Drinking Water Unit Mgr: Julia Pieper

Systems Mgmt. Unit Mgr: George Krisztian

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TEL: (517) 335-8184

FAX: (517) 335-8562

**Sample Number**

**LF19430**



| TESTING INFORMATION                 |                  |                | REGULATORY INFORMATION |                  |           |            |
|-------------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                        | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Pesticides Analysis by GC/MS</b> |                  |                |                        |                  |           |            |
| Hexachlorocyclohexane (alpha-BHC)   | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 319-84-6   |
| Hexachlorocyclohexane (beta-BHC)    | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 319-85-7   |
| Hexachlorocyclohexane (delta-BHC)   | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 319-86-8   |
| Hexachlorocyclopentadiene           | Not Detected     | 05/23/2014     | 0.0005                 | 0.05             | EPA 525.2 | 77-47-4    |
| Lindane (gamma-BHC)                 | Not Detected     | 05/23/2014     | 0.0001                 | 0.0002           | EPA 525.2 | 58-89-9    |
| Methoxychlor                        | Not Detected     | 05/23/2014     | 0.0001                 | 0.04             | EPA 525.2 | 72-43-5    |
| Metolachlor                         | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 51218-45-2 |
| Metribuzin                          | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 21087-64-9 |
| Molinate                            | Not Detected     | 05/23/2014     | 0.0005                 |                  | EPA 525.2 | 2212-67-1  |
| PCB (aroclor 1016)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 12674-11-2 |
| PCB (aroclor 1221)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11104-28-2 |
| PCB (aroclor 1232)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11141-16-5 |
| PCB (aroclor 1242)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 53469-21-9 |
| PCB (aroclor 1248)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 12672-29-6 |
| PCB (aroclor 1254)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11097-69-1 |
| PCB (aroclor 1260)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11096-82-5 |
| Polybrominated biphenyls            | Not Detected     | 05/23/2014     | 0.0001                 |                  | EPA 525.2 | 59536-65-1 |
| Simazine                            | Not Detected     | 05/23/2014     | 0.0002                 | 0.004            | EPA 525.2 | 122-34-9   |
| Toxaphene                           | Not Detected     | 05/23/2014     | 0.001                  | 0.003            | EPA 525.2 | 8001-35-2  |
| <b>Volatile Organic Compounds</b>   |                  |                |                        |                  |           |            |
| 1,1 Dichloroethane                  | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 75-34-3    |
| 1,1 Dichloroethylene                | Not Detected     | 05/27/2014     | 0.0005                 | 0.007            | EPA 524.2 | 75-35-4    |
| 1,1 Dichloropropene                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 563-58-6   |
| 1,1,1 Trichloroethane               | Not Detected     | 05/27/2014     | 0.0005                 | 0.2              | EPA 524.2 | 71-55-6    |
| 1,1,1,2 Tetrachloroethane           | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 630-20-6   |
| 1,1,2 Trichloroethane               | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 79-00-5    |
| 1,1,2,2 Tetrachloroethane           | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 79-34-5    |
| 1,2 Dichlorobenzene                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.6              | EPA 524.2 | 95-50-1    |
| 1,2 Dichloroethane                  | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 107-06-2   |
| 1,2 Dichloropropane                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 78-87-5    |
| 1,2,3 Trichlorobenzene              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 87-61-6    |
| 1,2,3 Trichloropropane              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 96-18-4    |
| 1,2,4 Trichlorobenzene              | Not Detected     | 05/27/2014     | 0.0005                 | 0.07             | EPA 524.2 | 120-82-1   |
| 1,2,4 Trimethylbenzene              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 95-63-6    |
| 1,3 Dichlorobenzene                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 541-73-1   |
| 1,3 Dichloropropane                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 142-28-9   |
| 1,3,5 Trimethylbenzene              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 108-67-8   |
| 1,4 Dichlorobenzene                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.075            | EPA 524.2 | 106-46-7   |

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**Sample Number****LF19430**

| TESTING INFORMATION               |                  |                | REGULATORY INFORMATION |                  |           |            |
|-----------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                      | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Volatile Organic Compounds</b> |                  |                |                        |                  |           |            |
| 2,2 Dichloropropane               | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 594-20-7   |
| Benzene                           | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 71-43-2    |
| Bromobenzene                      | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 108-86-1   |
| Bromochloromethane                | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 74-97-5    |
| Bromodichloromethane              | 0.020            | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 75-27-4    |
| Bromoform                         | 0.0010           | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 75-25-2    |
| Bromomethane                      | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 74-83-9    |
| Carbon tetrachloride              | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 56-23-5    |
| Chlorobenzene                     | Not Detected     | 05/27/2014     | 0.0005                 | 0.1              | EPA 524.2 | 108-90-7   |
| Chlorodibromomethane              | 0.013            | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 124-48-1   |
| Chloroethane                      | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 75-00-3    |
| Chloroform                        | 0.022            | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 67-66-3    |
| Chloromethane                     | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 74-87-3    |
| cis-1,2 Dichloroethylene          | Not Detected     | 05/27/2014     | 0.0005                 | 0.07             | EPA 524.2 | 156-59-2   |
| cis-1,3 Dichloropropene           | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 10061-01-5 |
| Dibromomethane                    | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 74-95-3    |
| Dichlorodifluoromethane           | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 75-71-8    |
| Dichloromethane                   | Not Detected     | 05/27/2014     | 0.0006                 | 0.005            | EPA 524.2 | 75-09-2    |
| Ethylbenzene                      | Not Detected     | 05/27/2014     | 0.0005                 | 0.7              | EPA 524.2 | 100-41-4   |
| Fluorotrichloromethane            | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 75-69-4    |
| Hexachlorobutadiene               | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 87-68-3    |
| Isopropylbenzene                  | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 98-82-8    |
| m & p-Xylene                      | Not Detected     | 05/27/2014     | 0.0005                 | 10               | EPA 524.2 | XYLMP-00-C |
| Methyl ethyl ketone               | Not Detected     | 05/27/2014     | 0.005                  |                  | EPA 524.2 | 78-93-3    |
| Methyl isobutyl ketone            | Not Detected     | 05/27/2014     | 0.005                  |                  | EPA 524.2 | 108-10-1   |
| Methyl-tert-butyl ether (MTBE)    | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 1634-04-4  |
| Naphthalene                       | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 91-20-3    |
| n-Butylbenzene                    | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 104-51-8   |
| Nitrobenzene                      | Not Detected     | 05/27/2014     | 0.01                   |                  | EPA 524.2 | 98-95-3    |
| n-Propylbenzene                   | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 103-65-1   |
| o-Chlorotoluene                   | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 95-49-8    |
| o-Xylene                          | Not Detected     | 05/27/2014     | 0.0005                 | 10               | EPA 524.2 | 95-47-6    |
| p-Chlorotoluene                   | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 106-43-4   |
| p-Isopropyltoluene                | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 99-87-6    |
| sec-Butylbenzene                  | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 135-98-8   |
| Styrene                           | Not Detected     | 05/27/2014     | 0.0005                 | 0.1              | EPA 524.2 | 100-42-5   |
| tert-Butylbenzene                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 98-06-6    |
| Tetrachloroethylene               | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 127-18-4   |
| Tetrahydrofuran                   | Not Detected     | 05/27/2014     | 0.005                  |                  | EPA 524.2 | 109-99-9   |

CAS# : Chemical Abstract Service Registry Number

MCL : Maximum Contaminant Level

AL : Action Level

RL : Reporting Limit

mg/L : milligrams / Liter (ppm)

ppm : parts per million

MPN : Most Probable Number

CFU : Colony Forming Unit

Laboratory Contacts

Drinking Water Unit Mgr: Julia Pieper

Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003  
P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562



**Sample Number**  
**LF19430**

| TESTING INFORMATION               |                  |                | REGULATORY INFORMATION |                  |           |            |
|-----------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                      | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Volatile Organic Compounds</b> |                  |                |                        |                  |           |            |
| Toluene                           | Not Detected     | 05/27/2014     | 0.0005                 | 1                | EPA 524.2 | 108-88-3   |
| Total Trihalomethanes             | 0.056            | 05/27/2014     | NA                     | 0.080            | EPA 524.2 | TTHM-00-C  |
| Total Xylenes                     | Not Detected     | 05/27/2014     | NA                     | 10               | EPA 524.2 | 1330-20-7  |
| trans-1,2 Dichloroethylene        | Not Detected     | 05/27/2014     | 0.0005                 | 0.1              | EPA 524.2 | 156-60-5   |
| trans-1,3 Dichloropropene         | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 10061-02-6 |
| Trichloroethylene                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 79-01-6    |
| Vinyl chloride                    | Not Detected     | 05/27/2014     | 0.0004                 | 0.002            | EPA 524.2 | 75-01-4    |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

[illegible]

**Fluoridation &  
Chlorination**

 City of Flint Water Treatment Plant  
**WSSN: 2310**

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| Date | Fluoride<br>Applied as<br>F- mg/L | Fluoride Analysis (mg/L) |      |       | Chlorine Application (mg/L) |               |                   | Chlorine Residual (mg/L) |       |           |       |      |       |
|------|-----------------------------------|--------------------------|------|-------|-----------------------------|---------------|-------------------|--------------------------|-------|-----------|-------|------|-------|
|      |                                   |                          |      |       | Intermediate<br>Chlorine    | Post Chlorine | Total<br>Chlorine | Filtered                 |       | 3 MG Well |       | Tap  |       |
|      |                                   | Raw                      | Tap  | Dist. |                             |               |                   | Free                     | Total | Free      | Total | Free | Total |
| 1    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 2    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 3    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 4    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 5    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 6    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 7    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 8    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 9    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 10   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 11   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 12   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 13   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 14   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 15   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 16   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 17   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 18   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 19   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 20   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 21   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 22   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 23   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 24   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 25   | 0                                 | 0.14                     | 0.59 |       | 3.5                         | 0             | 3.5               | 1.8                      | 2.1   |           |       | 0.8  | 1.0   |
| 26   | 0                                 | 0.14                     | 0.53 |       | 3.5                         | 0             | 3.5               | 1.7                      | 1.9   |           |       | 0.9  | 1.1   |
| 27   | 0                                 | 0.13                     | 0.53 |       | 3.6                         | 0             | 3.6               | 1.7                      | 1.9   | 1.5       | 1.8   | 1.0  | 1.1   |
| 28   | 0                                 | 0.13                     | 0.19 |       | 3.7                         | 0             | 3.7               | 1.7                      | 1.9   | 1.4       | 1.8   | 0.9  | 1.0   |
| 29   | 0                                 | 0.15                     | 0.58 | 0.43  | 3.7                         | 0             | 3.7               | n/a                      | n/a   | n/a       | n/a   | 0.9  | 1.1   |
| 30   | 0                                 | 0.15                     | 0.62 |       | 3.5                         | 0             | 3.5               | 1.7                      | 2.0   | 1.5       | 1.8   | 1.0  | 1.1   |
| Avg. | 0                                 | 0.14                     | 0.51 | 0.43  | 3.6                         | 0             | 3.6               | 1.7                      | 2.0   | 1.5       | 1.8   | 0.9  | 1.1   |
| Max. | 0                                 | 0.15                     | 0.62 | 0.43  | 3.7                         | 0             | 3.7               | 1.8                      | 2.1   | 1.5       | 1.8   | 1.0  | 1.1   |
| Min. | 0                                 | 0.13                     | 0.19 | 0.43  | 3.5                         | 0             | 3.5               | 1.7                      | 1.9   | 1.4       | 1.8   | 0.8  | 1.0   |



## Chemical Analyses

City of Flint Water Treatment Plant  
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| Date | pH (S.U.) |      | Total Hardness as CaCO <sub>3</sub> (mg/L) |     | Total Alkalinity as CaCO <sub>3</sub> (mg/L) |     | Non-Carbonate Hardness as CaCO <sub>3</sub> (mg/L) |     | Calcium as Ca <sup>2+</sup> (mg/L) |      | Magnesium as Mg <sup>2+</sup> (mg/L) |     | Chloride as Cl <sup>-</sup> (mg/L) |     |
|------|-----------|------|--------------------------------------------|-----|----------------------------------------------|-----|----------------------------------------------------|-----|------------------------------------|------|--------------------------------------|-----|------------------------------------|-----|
|      | Raw       | Tap  | Raw                                        | Tap | Raw                                          | Tap | Raw                                                | Tap | Raw                                | Tap  | Raw                                  | Tap | Raw                                | Tap |
| 1    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 2    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 3    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 4    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 5    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 6    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 7    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 8    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 9    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 10   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 11   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 12   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 13   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 14   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 15   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 16   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 17   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 18   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 19   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 20   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 21   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 22   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 23   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 24   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 25   |           | 7.39 |                                            | 96  |                                              | 75  |                                                    | 21  |                                    | 29.7 |                                      | 5.3 |                                    |     |
| 26   | 8.31      | 7.28 | 255                                        | 98  | 200                                          | 73  | 55                                                 | 25  | 77.9                               | 29.7 | 13.6                                 | 5.8 | 48                                 | 24  |
| 27   | 8.34      | 7.32 | 249                                        | 98  | 199                                          | 70  | 50                                                 | 28  | 75.4                               | 30.5 | 14.6                                 | 5.8 | 42                                 | 32  |
| 28   | 8.39      | 8.46 | 247                                        | 92  | 205                                          | 60  | 42                                                 | 32  | 82.6                               | 46.5 | 9.8                                  | 8.3 | 43                                 | 68  |
| 29   | 8.46      | 7.35 | 230                                        | 98  | 190                                          | 70  | 40                                                 | 28  | 76.2                               | 30.5 | 9.7                                  | 5.3 |                                    |     |
| 30   | 8.41      | 7.30 | 248                                        | 98  | 208                                          | 73  | 40                                                 | 25  | 72.1                               | 29.7 | 17.5                                 | 5.8 | 45                                 | 17  |
| Avg. | 8.38      | 7.52 | 246                                        | 97  | 200                                          | 70  | 45                                                 | 27  | 76.8                               | 32.8 | 13.0                                 | 6.1 | 45                                 | 35  |
| Max. | 8.46      | 8.46 | 255                                        | 98  | 208                                          | 75  | 55                                                 | 32  | 82.6                               | 46.5 | 17.5                                 | 8.3 | 48                                 | 68  |
| Min. | 8.31      | 7.28 | 230                                        | 92  | 190                                          | 60  | 40                                                 | 21  | 72.1                               | 29.7 | 9.7                                  | 5.3 | 42                                 | 17  |

**Bacteriological &  
Physical Parameters**

 City of Flint Water Treatment Plant  
**WSSN: 2310**

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| Date | Total Coliform     |       |                         |       |           |       | Standard Plate Count |     | Wind Direction | Temp. C | Color |     | Odor |  |
|------|--------------------|-------|-------------------------|-------|-----------|-------|----------------------|-----|----------------|---------|-------|-----|------|--|
|      | Raw (Colilert MPN) |       | Filter Confluence (N&S) |       | Plant Tap |       |                      |     |                |         |       |     |      |  |
|      | # Samples          | Count | # Samples               | # pos | # Samples | # pos | Raw                  | Tap | Raw            | Raw     | Tap   | Raw | Tap  |  |
| 1    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 2    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 3    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 4    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 5    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 6    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 7    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 8    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 9    |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 10   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 11   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 12   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 13   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 14   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 15   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 16   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 17   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 18   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 19   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 20   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 21   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 22   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 23   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 24   |                    |       |                         |       |           |       |                      |     |                |         |       |     |      |  |
| 25   | 1                  |       | 12                      | 0     | 1         | 0     |                      | < 2 |                | 11.0    |       |     |      |  |
| 26   | 1                  |       | 12                      | 0     | 1         | 0     | > 1476               | < 2 |                | 11.4    |       |     |      |  |
| 27   | 1                  |       | 12                      | 0     | 1         | 0     | 142                  | < 2 |                | 11.1    |       |     |      |  |
| 28   | 1                  |       | 8                       | 0     | 1         | 0     | 532                  | < 2 |                | 11.5    |       |     |      |  |
| 29   | 1                  |       | 0                       | 0     | 1         | 0     |                      | < 2 |                | 12.1    |       |     |      |  |
| 30   | 1                  |       | 4                       | 0     | 1         | 0     | 1246                 | < 2 |                | 13.5    |       |     |      |  |
| Avg. |                    |       |                         |       |           |       | n/a                  | < 2 |                | 11.8    |       |     |      |  |
| Max. |                    |       |                         |       |           |       | > 1476               | < 2 |                | 13.5    |       |     |      |  |
| Min. |                    |       |                         |       |           |       | 142                  | < 2 |                | 11.0    |       |     |      |  |

**Distribution System  
Monitoring**

 City of Flint Water Treatment Plant  
**WSSN: 2310**

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| Date | Free Chlorine Residual at Bacteriological Monitoring Stations mg/l |     |     |     |     |     |     |     |     |     | Number<br>of<br>Samples |
|------|--------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------|
|      | 1                                                                  | 2   | 3   | 4   | 5   | 6   | 7   | 8   | CS  | WR  |                         |
| 1    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 2    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 3    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 4    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 5    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 6    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 7    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 8    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 9    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 10   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 11   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 12   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 13   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 14   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 15   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 16   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 17   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 18   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 19   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 20   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 21   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 22   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 23   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 24   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 25   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 26   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 27   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 28   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 29   | 1.0                                                                | 0.8 | 1.0 | 0.7 | 0.8 | 0.8 | 1.1 | 0.8 | 0.7 | 0.9 | 10                      |
| 30   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 31   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |

| Distribution Sample Summary                      |     |
|--------------------------------------------------|-----|
| Total # of routine distribution samples analyzed | 115 |
| Total # of routine distribution samples required | 100 |

| Distribution Disinfectant Residual Summary              |     |
|---------------------------------------------------------|-----|
| Percent samples with a detectable disinfectant residual | 100 |
| Average disinfectant residual this month                | 0.9 |

| Distribution Bacteriological Summary             |   |
|--------------------------------------------------|---|
| Total # of positive routine distribution samples | 0 |
| Percent of routine distribution samples positive | 0 |

| Positive Distribution Samples |                    |      |                            |          |                      |
|-------------------------------|--------------------|------|----------------------------|----------|----------------------|
| Date                          | Monitoring Station | Date | Repeat Monitoring Stations | Residual | Positive or Negative |
|                               |                    |      |                            |          |                      |
|                               |                    |      |                            |          |                      |
|                               |                    |      |                            |          |                      |
|                               |                    |      |                            |          |                      |

April 2014

[illegible]

**Rennaker, Joanne (DEQ)**

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**Subject:** Flint OE Status Meeting  
**Location:** LAN Office, Okemos, MI

**Start:** Fri 11/7/2014 9:30 AM  
**End:** Fri 11/7/2014 12:00 PM  
**Show Time As:** Tentative

**Recurrence:** (none)

**Meeting Status:** Not yet responded

**Organizer:** Busch, Stephen (DEQ)  
**Required Attendees:** Prysby, Mike (DEQ); Cook, Pat (DEQ)  
**Optional Attendees:** Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)

Meeting to go over alternatives being considered by City of Flint in Operational Evaluation for TTHM.  
The meeting starts at 9:30 at LAN's office in Okemos.

Richard and Liane, I copied you for FYI, but you are welcome to come along.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, April 02, 2014 3:25 PM  
**To:** Rennaker, Joanne (DEQ) (RENNAKERJ@michigan.gov); prysbym@michigan.gov  
**Subject:** flint permit app request

Jo Anne,

We need to fax a the permit applications (just the application form) regarding the City of Flint we received on Monday to the following person. Mike has these permit apps. Thanks.

Helen Mills  
Fahey, Schultz, Burzych, Rhodes Law Firm  
Phone 517-381-3209  
Fax 517-381-5051

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 21, 2015 2:07 PM  
**To:** prysbym@michigan.gov  
**Subject:** Flint presentation with PN page  
**Attachments:** FlintPublicMeeting-DEQ.pptx

PN page notes added.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

# Michigan Department of Environmental Quality Community Water Supply

Information Regarding  
Total Trihalomethane (TTHM)  
Disinfection Byproducts



# DEQ - Community Water Supply

- Regulatory Authority over Public Water Systems
- Michigan Safe Drinking Water Act
- 1400 Community Supplies in MI (like Flint)
- Lansing Jackson Districts – 300 in 13 counties
- Oversight through:
  - Inspection
  - Monitoring
  - Construction Permitting
  - Planning
- Partnership and Compliance Assistance

# What are TTHM's

Trihalomethanes occur when natural organic matter in the water react with chlorine disinfectants.  
(Byproduct of disinfection process)

4 Chemical Compounds made up of these elements:

- Carbon
- Hydrogen
- Bromine
- Chlorine

# TTHM Standard

- Based on chronic exposure to low doses
- 80 parts per billion (0.080 ppm)
- Locational Running Annual Average (LRAA)
- Quarterly monitoring at each location
- Location and timing based on highest risk
- Running = over last 4 quarters, not calendar yr
- Total sum of 4 quarters not to exceed 320 ppb

# Flint TTHM Results

| TTHM Results (mg/L)                          |              |              |              |              |              |
|----------------------------------------------|--------------|--------------|--------------|--------------|--------------|
|                                              | 5/21/14      | 8/21/14      | 11/20/14     | LRAA         | OEL          |
| DBP1 McDonalds<br>3719 Davison               | <b>0.162</b> | <b>0.145</b> | 0.059        | <b>0.092</b> | <b>0.106</b> |
| DBP2 Liquor Palace<br>3302 S. Dort Highway   | <b>0.112</b> | <b>0.127</b> | 0.033        | 0.068        | 0.076        |
| DBP3 North Flint Auto<br>6204 N. Saginaw St. | <b>0.097</b> | <b>0.118</b> | 0.041        | 0.064        | 0.074        |
| DBP4 University Market<br>2501 Flushing Road | <b>0.106</b> | <b>0.196</b> | <b>0.094</b> | <b>0.099</b> | <b>0.122</b> |
| DBP5 Taco Bell<br>3606 Corunna Road          | 0.079        | <b>0.181</b> | 0.034        | 0.074        | <b>0.082</b> |
| DBP6 Rite-Aid<br>Pharmacy<br>5018 Clio Road  | <b>0.088</b> | <b>0.144</b> | 0.054        | 0.072        | <b>0.085</b> |
| DBP7 Salem Housing<br>3216 MLK Boulevard     | <b>0.082</b> | <b>0.112</b> | 0.050        | 0.061        | 0.074        |
| DBP8 BP Gas Station<br>822 S. Dort Highway   | 0.075        | <b>0.112</b> | 0.036        | 0.056        | 0.065        |

# Potential Health Effects Related to TTHM

- Federal Language
- Some people who drink water containing TTHM in excess of the MCL over many years could experience liver, kidney, or central nervous system problems and increased risk of cancer.

# Health Effect Basis by EPA

- Toxicology Studies - Uncertainty in using results of high-dose studies in animals to estimate risk to humans from chronic exposure to low doses in drinking water
- Epidemiology – Findings are contradictory. No conclusion of causal link between exposure and health effects.
- EPA determined evidence supports a potential hazard concern and establishment of standard.
- Considered best course of action at this time to reduce potential risks.

# TTHM Violation Requirements

- Water supply must take steps to reduce the amount of TTHM so that they are below the standard.
- Water supply must notify customers of the violation within 30 days of after learning of the violation.

# Operational Evaluation

- System treatment practices
- System distribution practices
- Storage tank operations
- Excess storage capacity
- Distribution system flushing
- Source water quality
- Treatment changes
- TTHM contributions
- Steps to minimize future standard violations



# Public Notification

- Designed to provide information to the customer to make more informed decisions
- Short term exposure to long term contaminant has different impact on each individual based on their background
- If health effects had been acute notification would be provided in 24 hours with specific actions for customers

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, April 02, 2014 12:57 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov  
**Cc:** Kris Philip (philipk@michigan.gov); Fisher, Brant (DEQ)  
**Subject:** Flint River - Genesee County Park & Rec Attorney Call

FYI.

I received a call this morning from Helen Mills, an attorney from Fahey Schultz Burzych Rhodes Law Firm representing the Genesee County Parks and Recreation Commission this morning.

She had some questions following the recent article in the Flint Journal and had mistakenly jumped to the conclusion that the construction permit applications to our office from the City of Flint included a withdrawal permit for the Flint River.

I explained to her that the City already has the ability to withdraw water from the River since the WTP was originally constructed in the 1960's, and that a baseline capacity of 90 MGD was established for the City of Flint (along with all existing community water supply withdrawals) when water withdrawal legislation went into effect a few years ago. I referred her to Brant Fisher for more specific questions regarding the water withdrawal legislation and establishment of baseline capacities.

I explained that the City has kept the WTP as an emergency backup system but now has indicated they plan to use the Flint River and WTP on a continuous basis until the KWA pipeline is available to provide an alternate source water for the WTP. The construction permit applications in question are for modifications to the WTP to address differences in short term emergency operation vs. long term continuous operation.

She also asked about the permit process which I explained is covered under Section 4 of Act 399 and Part 13 of the Administrative Rules, that the application contains basic information and is enclosed with engineering plans and specifications sealed by a PE licensed in the state. I informed her that review of preliminary plans is common for more complex projects such as this to help save time, effort, and money by addressing design issues upfront. She asked about the status and I indicated that we received permit applications on Monday and that staff are currently reviewing the plans and specifications.

She may call back with more questions.

The Genesee Co. Park & Rec has facilities along the Flint River and is concerned about impacts from the City utilizing the River. The Halloway Dam/Reservoir is controlled by the City, but its operation also carries some requirements to maintain certain levels within the waterway.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, April 08, 2015 11:15 AM  
**To:** Bartley, Cheryl (DEQ)  
**Cc:** Bishop, Susan (DEQ)  
**Subject:** Flint River Inquiry

**Importance:** High

Could you please have any of your staff that oversee Genesee County NPDES and Non-Point Source regarding the Flint River respond to me directly.

I am working with EPA Region 5 in response to a letter to the White House regarding Flint drinking water. The complainant indicates they received a "Letter of Alert" in January 2015 regarding the detection of refrigerant and solvent contaminants in the Flint River.

I just need to know if WRD staff are aware of any monitoring in the Flint River that could be associated with this, and if they might know where this "Letter of Alert" could be coming from.

Thanks.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, April 08, 2015 2:06 PM  
**To:** Crooks, Jennifer (crooks.jennifer@epa.gov)  
**Cc:** prysbym@michigan.gov  
**Subject:** Flint River Monitoring

Jennifer,

Per our phone conversation this morning, I have contacted MDEQ Water Resources Division Staff. This included:  
Stephanie Kammer, Acting Lansing District Supervisor  
Chuck Bennett, NPDES and Wastewater Engineering  
William Keiper, Aquatic Biologist, Surface Water Assessment Section  
Susan Doty, Storm Water NPDES and Non-point Source

All responded and none of them are aware of such monitoring (solvents or refrigerants) being done on the Flint River.

Please let me know if you end up with a copy of this "Letter of Alert" from your complainant. I'm sure we would all be interested in the source of such information.

Thanks.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, September 05, 2014 2:47 PM  
**To:** Daugherty Johnson (djohnson@cityofflint.com); Brent Wright (bwright@cityofflint.com); 'mglasgow@cityofflint.com'  
**Cc:** Richard Benzie P.E. (BENZIER@michigan.gov); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** Flint Site 5 Boil water advisory documents  
**Attachments:** Boil PN TC detected.pdf; Flint-Site5-BWA.pdf

Gentlemen,

Attached are the boil water advisory public notice with all required language and a map of the impacted zone. Please distribute to your media contacts immediately.

Once we have 2 sets of non-detect samples from the impacted area we can discuss lifting the advisory.

You indicated that flushing of the area has already started.

Please ensure the water system is taking investigative steps to identify a possible source

- o Inspect storage facilities
- o Verify pumping and treatment system remains intact and uncontaminated
- o Inspect cross connection accounts in the affected area
- o Survey the area for any unidentified cross connections
- o Review any recent construction or maintenance in the area
- o Check for building permits and with building inspectors for any recent construction in the area
- o Check with fire departments and DPW for any temporary or improper hydrant use
- o Review pumpage and check for breaks, leaks, or an uptick in unaccounted water loss
- o Ensure any vacant properties have had the water service shutoff
- o Review CI residual data, conduct additional CI monitoring, and increase disinfectant residual

I will be in contact with the County Health Department and the MDARD Food and Dairy Division.

You can reach me over the weekend at this number or Mike Prysby at his number.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

## LOCALIZED DRINKING WATER WARNING

### *Coliform bacteria detected in localized area of Flint water system*

#### **BOIL YOUR WATER BEFORE USING**

Our water system detected the presence of coliform bacteria in the water supply on September 3, 2014. We routinely monitor for the presence of drinking water contaminants. We took routine samples for coliform bacteria during on September 2, 2014 from all sampling locations throughout the city. The location near Flushing Road and Chevrolet Avenue showed the presence of coliform bacteria. We took three repeat samples at this location and at adjacent locations on September 3 and again on September 4, 2014. Two of the three samples on the 3<sup>rd</sup> showed the presence of total coliform bacteria and three of the three samples collected on the 4<sup>th</sup> in this same area showed the presence of total coliform bacteria. All other monitoring locations in the City continue to show no presence of Coliform bacteria.

#### **What should I do?**

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and preparing food. Boiling kills bacteria and other organisms in the water. **Continue using boiled or bottled water until further notice.** This boil notice is limited to the area bordered by Dayton Street (north), DuPont Street (east), Flint River (south), and LaVelle Road to Flint River (west).

If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from your health care providers about drinking this water.

#### **What does this mean?**

Total coliform bacteria are generally not harmful themselves. *Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.*

Usually, coliforms are a sign that there could be a problem with the treatment or distribution system (pipes). Whenever we detect coliform bacteria in any sample, we do follow-up testing to see if other bacteria of greater concern, such as fecal coliform or E. coli, are present. We did not find any of these bacteria in our subsequent testing. If we had, we would have notified you immediately. However, we are still finding coliforms in the drinking water.

#### **What happened? What is being done?**

We are still detecting coliform bacteria. We will inform you when our sampling shows that no bacteria are detected. We are flushing the system and increasing the chlorine residual within the affected area. We anticipate resolving the problem within the next two to three days. In the meantime, please continue using boiled or bottled water until we notify you otherwise.

If you have questions, you may contact Mr. Brent Wright of the City of Flint at 810-787-6537, [bwright@cityofflint.com](mailto:bwright@cityofflint.com), 4500 North Dort Highway, Flint MI. 48505 or Daughtry Johnson, Utilities Administrator (810) 766-7135, ext. 2602. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1-800-426-4791.

#### **CERTIFICATION:**

WSSN: [enter Water Supply Serial Number]

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

Signature

Title

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DEQ.

cc: [cc the local health department and the Michigan Department of Agriculture and Rural Development if the boil affects a municipal supply.]

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you as a precautionary measure by the City of Flint.

**CERTIFICATION:**

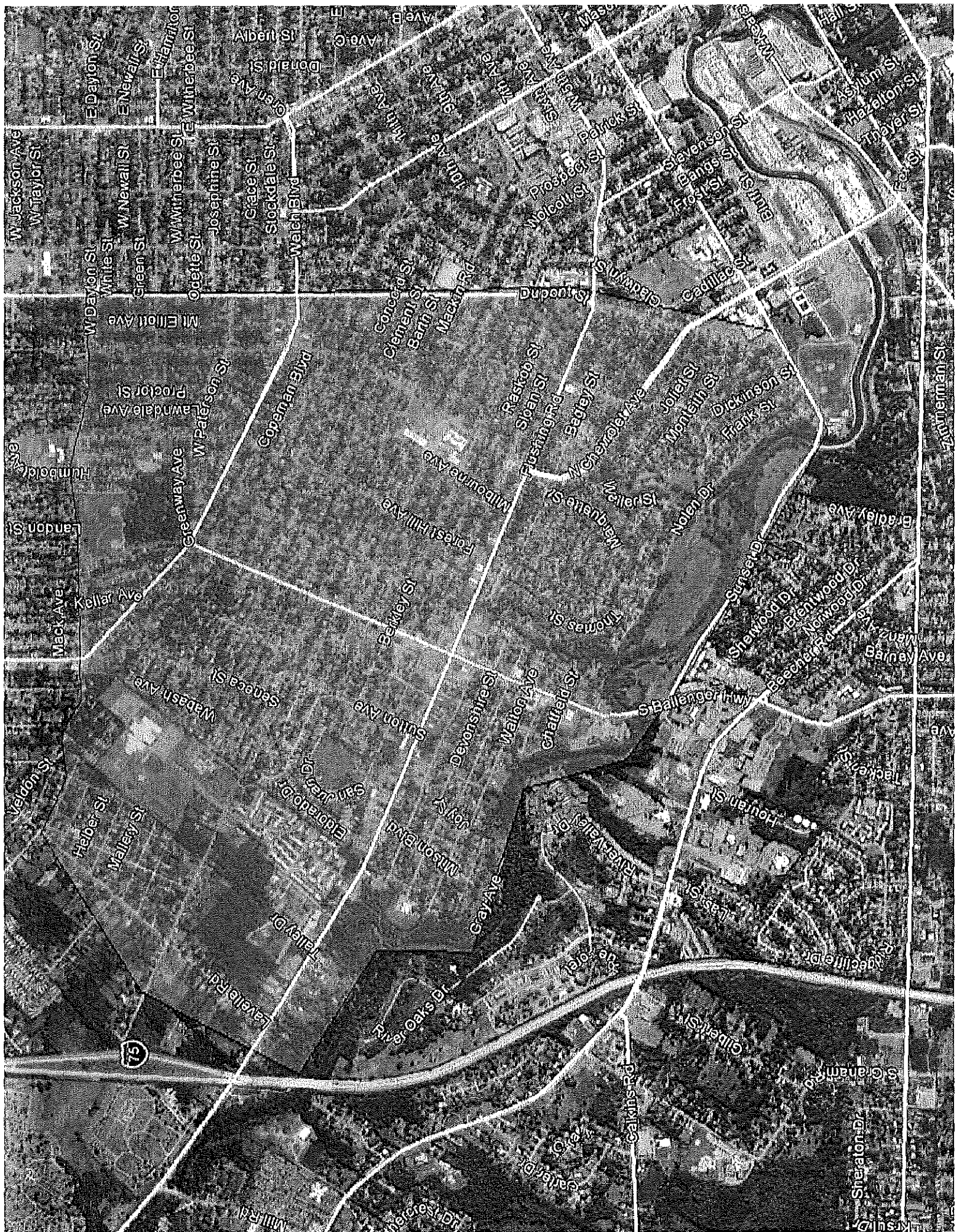
WSSN: [enter Water Supply Serial Number]

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

\_\_\_\_\_  
Signature\_\_\_\_\_  
Title\_\_\_\_\_  
Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DEQ.

cc: [cc the local health department and the Michigan Department of Agriculture and Rural Development if the boil affects a municipal supply.]





**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, March 26, 2014 4:36 PM  
**To:** Shekter Smith, Liane (DEQ); Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** Flint Startup

One of the things we didn't get to today that I would like to make sure everyone is on the same page on is what Flint will be required to do in order to start using their plant full time.

Because the plant is setup for emergency use, they could startup at anytime, but starting up for continuous operation will carry significant changes in regulatory requirements so there is a very gray area as to what we consider for startup.

Can we meet Thursday or Friday to discuss this?

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, April 25, 2014 11:14 AM  
**To:** prysbym@michigan.gov  
**Subject:** Flint Test Runs

Mike,

Can you confirm that Flint has been conducting quarterly test runs at the WTP since 2006?

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, June 10, 2015 8:31 AM  
**To:** Crooks, Jennifer (crooks.jennifer@epa.gov)  
**Subject:** Flint TTHM 2nd Quarter 2015 VN  
**Attachments:** Flint VN TTHM 6\_9\_15.pdf

Jennifer,

This is in the mail but I thought you might want to see it for the call this morning.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING DISTRICT OFFICE



DAN WYANT  
DIRECTOR

June 9, 2015

Mr. Brent Wright, Operations Supervisor  
City Of Flint – Department of Public Works  
Flint Water Plant  
4500 North Dort Highway  
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Violation Notice (VN) – Maximum Contaminant Level for Total  
Trihalomethanes (TTHM)  
2nd Quarter 2015 Monitoring Period

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the city of Flint (City) is in violation of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels for disinfection byproducts (MCLs)*, of the 1979 Administrative Code.

In accordance with R 325.10610, *MCLs*, of the 1979 Administrative Code, the MCL for disinfection byproduct TTHM is 0.080 milligrams per liter (mg/L) as a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the City's highest TTHM LRAA, based on the last four quarters, ending June 30, 2015, is 0.094 mg/L which exceeds the standard, and at this time only one of the eight sample site locations exceed the LRAA standard of 0.080 mg/L.

Our investigation consisted of a review of ODWMA files for laboratory reports received for compliance monitoring. Our investigation is considered complete. This violation began on June 1, 2015, and will continue until the TTHM LRAA is below the MCL at all sample sites.

Mr. Brent Wright

2

June 9, 2015

| TTHM Results (mg/L)                             |              |              |         |         |              |       |
|-------------------------------------------------|--------------|--------------|---------|---------|--------------|-------|
|                                                 | 8/21/14      | 11/20/14     | 2/17/15 | 5/18/15 | LRAA         | OEL   |
| DBP1 McDonalds<br>3719 Davison                  | <b>0.145</b> | 0.059        | 0.0162  | 0.0514  | 0.068        | 0.044 |
| DBP2 Liquor Palace<br>3302 South Dort Highway   | <b>0.127</b> | 0.033        | 0.0168  | 0.0635  | 0.060        | 0.044 |
| DBP3 North Flint Auto<br>6204 North Saginaw St. | <b>0.118</b> | 0.041        | 0.0149  | 0.0452  | 0.055        | 0.037 |
| DBP4 University Market<br>2501 Flushing Road    | <b>0.196</b> | <b>0.094</b> | 0.0245  | 0.0598  | <b>0.094</b> | 0.059 |
| DBP5 Taco Bell<br>3606 Corunna Road             | <b>0.181</b> | 0.034        | 0.0151  | 0.0547  | 0.072        | 0.040 |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road        | <b>0.144</b> | 0.054        | 0.0192  | 0.0605  | 0.069        | 0.048 |
| DBP7 Salem Housing<br>3216 MLK Boulevard        | <b>0.112</b> | 0.050        | 0.0285  | 0.0727  | 0.066        | 0.056 |
| DBP8 BP Gas Station<br>822 South Dort Highway   | <b>0.112</b> | 0.036        | 0.0199  | 0.0461  | 0.054        | 0.037 |

We are encouraged by the results from the most recent round of compliance samples collected on May 18, 2015, which again show individual TTHM levels below 0.080 mg/L at all locations throughout the City's system. Operational Evaluation Reports from December 2014, February 2015, and May 2015, have identified possible causes and corrective measures for the previous elevated TTHM levels which we encourage the City to continue implementing. These modifications have likely contributed in part to the reduction in TTHM levels reported for the most recent quarter in comparison to levels in May 2014, and suggest the City may be able to achieve compliance with the TTHM standard at all sites by continuing these efforts.

Our office is currently reviewing the Operational Evaluation Report dated May 29, 2015, and will provide the City and their consultant with comments, as needed, to help address this MCL violation.

Further, the TTHM operational evaluation level (OEL) calculated in accordance with R 325.10719I, *Disinfection byproducts: operational evaluation levels*, of the 1979 Administrative Code, is now below the 0.080 mg/L operational evaluation trigger at all eight sample site locations. However, our office is requesting that an operational evaluation again be conducted incorporating the most recent sample results, given the increase in TTHM levels from February 2015 results, and that the next monitoring period of August has been identified as the City's peak month for TTHM levels. **Please provide our office with an updated Operational Evaluation Report by Monday, August 31, 2015.**

If you have any other factual information you would like us to consider regarding the violation identified in this VN, please provide them in a written response by June 23, 2015.

Mr. Brent Wright

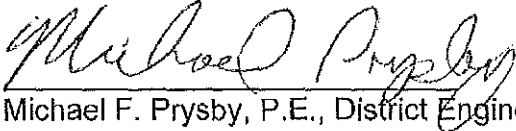
3

March 5, 2015

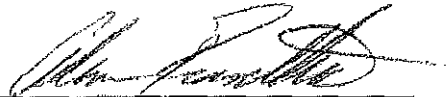
Administrative rule R 325.10403 of Act 399 requires that suppliers provide public notice (PN) as soon as practical, but no later than thirty (30) days after the supplier learns of this type of violation, by mail or direct delivery **and** by any other means reasonably calculated to reach customers not normally reached by mail. Enclosed is a sample PN which contains the minimum required language. The City is encouraged to include additional information regarding its response efforts to this violation. **Please notify your consumers by July 1, 2015, and send us a signed and dated copy of the notice that you issued within ten (10) days of distributing the PN.** This violation must also be included in your 2015 Consumer Confidence Report, due by July 1, 2016. The PN must be repeated every quarter until you no longer exceed the TTHM standard. Failure to issue a PN for this violation will result in a fine of at least \$1,000 per event, with a maximum of \$5,000 per violation.

We anticipate and appreciate your continued cooperation in resolving this matter. If you have any questions regarding this VN, please contact us at the numbers below; at prysbym@michigan.gov; or rosenthala@michigan.gov; or at DEQ, P.O. Box 30242, Lansing, Michigan 48909-7742.

Sincerely,



Michael F. Prysby, P.E., District Engineer  
Lansing District Office  
Office of Drinking Water and  
Municipal Assistance  
517-290-8817



Adam Rosenthal, Environmental Quality  
Analyst  
Lansing District Office  
Office of Drinking Water and  
Municipal Assistance  
517-284-6644

Enclosure

cc: Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5  
Mr. Robert Bincsik, City of Flint  
Mr. Howard Croft, City of Flint  
Mr. Michael Glasgow, City of Flint  
Genesee County Health Department  
Ms. Liane Shekter Smith, DEQ  
Mr. Richard Benzie, DEQ  
Mr. Stephen Busch, DEQ

## IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

### City of Flint Did Not Meet Treatment Requirements

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (August 21, November 20 of 2014, and February 17 & May 18 of 2015). The average of the results at **ANY** of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the MCL. The standard for TTHMs is 80 micro grams per liter (µg/L). The location reporting the highest TTHM level was 94 µg/L; thus, our water system exceeds the TTHM MCL.

#### What should I do?

- There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers.
- You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

#### What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

*People who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.*

#### What is being done?

We are currently working on solutions to correct the problem. We anticipate resolving the problem in 2015. Our most recent individual sample results were all less than the 80 µg/L standard, however since compliance is calculated using a locational running annual average (LRAA) of the most recent four quarters, we are still out of compliance with the MCL at one of eight locations.

For more information, please contact Mr. Brent Wright at 517-787-6537, or the Flint Water Plant at 4500 North Dort Highway, Flint, Michigan 48505.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by the City of Flint.

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#### CERTIFICATION:

WSSN: 02310

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

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|                                                                                                                |       |                  |
|----------------------------------------------------------------------------------------------------------------|-------|------------------|
| Signature                                                                                                      | Title | Date Distributed |
| Reminder to water supplier: This notice/certification must be sent to the Department of Environmental Quality. |       |                  |

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, September 02, 2015 9:14 AM  
**To:** 'Rennaker, Joanne (DEQ) (RENNAKERJ@michigan.gov)'  
**Cc:** prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** Flint TTHM 3rd quarter letter  
**Attachments:** Flint DBP 3Q15-revised.doc

Jo Anne,

I believe the attached is ready to be finalized.

I would like a pdf of the signed letter to email over to members of the legislature.

Stephen Busch, P.E.  
MDEQ Lansing District Coordinator  
Office of Drinking Water and Municipal Assistance  
Lansing and Jackson District Supervisor  
517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)



September 3, 2015

Mr. Brent Wright, Operations Supervisor  
 City Of Flint – Department of Public Works  
 Flint Water Plant  
 4500 North Dort Highway  
 Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: City of Flint – Water Supply  
 Return to Compliance Total Trihalomethanes (TTHM)  
 3rd Quarter 2015 Monitoring Period

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the City of Flint (City) has returned to compliance with the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels for disinfection byproducts (MCLs)*, of the 1979 Administrative Code.

In accordance with Administrative Rule 610 (R 325.10610, *MCLs for disinfection byproducts*), the MCL for the disinfection byproduct TTHM is 0.080 milligrams per liter (mg/L). Compliance is determined based on a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the LRAA all eight of the City's TTHM compliance sampling sites now comply with this standard based on the last four quarterly monitoring periods, ending August 31, 2015. This return to compliance regarding TTHM's began on September 1, 2015, and will continue as long as the LRAA at each of the City's TTHM compliance sampling sites remain below this standard.

| TTHM Results (mg/L)                             |              |         |         |               |       |       |
|-------------------------------------------------|--------------|---------|---------|---------------|-------|-------|
|                                                 | 11/20/14     | 2/17/15 | 5/18/15 | 8/18/15       | LRAA  | OEL   |
| DBP1 McDonalds<br>3719 Davison                  | 0.059        | 0.0162  | 0.0514  | 0.0755        | 0.050 | 0.055 |
| DBP2 Liquor Palace 3302<br>South Dort Highway   | 0.033        | 0.0168  | 0.0635  | 0.0532        | 0.042 | 0.047 |
| DBP3 North Flint Auto<br>6204 North Saginaw St. | 0.041        | 0.0149  | 0.0452  | 0.0426        | 0.036 | 0.036 |
| DBP4 University Market<br>2501 Flushing Road    | <b>0.094</b> | 0.0245  | 0.0598  | 0.0706        | 0.062 | 0.056 |
| DBP5 Taco Bell<br>3606 Corunna Road             | 0.034        | 0.0151  | 0.0547  | 0.0619        | 0.042 | 0.049 |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road        | 0.054        | 0.0192  | 0.0605  | 0.0595        | 0.048 | 0.050 |
| DBP7 Salem Housing<br>3216 MLK Boulevard        | 0.050        | 0.0285  | 0.0727  | <b>0.0903</b> | 0.060 | 0.070 |
| DBP8 BP Gas Station<br>822 South Dort Highway   | 0.036        | 0.0199  | 0.0461  | 0.0549        | 0.039 | 0.044 |

Mr. Brent Wright

2

September 3, 2015

Corrective measures by the City have been successful in achieving compliance with this standard. These measures have included replacement of anthracite filter media with granular activated carbon as well as the optimization of water treatment plant and distribution system processes and operations as recommended through Operational Evaluations conducted by the City. It is important that the City continue to follow these recommendations in order to limit disinfection byproduct formation and maintain compliance with the MCL LRAA standards. While the MCL LRAA standard has now been met at all eight compliance sampling sites, an individual TTHM concentration above 0.080 mg/L was measured at one location, DBP 7, during peak month sampling in August 2015.

Our Office encourages the City to continue informing customers about this updated water quality information and compliance with the TTHM MCL standard.

If you have any questions regarding this letter, please contact us at the numbers below; at prysbym@michigan.gov; or rosenthala@michigan.gov.

Sincerely,

Michael F. Prysby, P.E., District Engineer  
Lansing District Office  
Office of Drinking Water and  
Municipal Assistance  
517-290-8817

Adam Rosenthal, Environmental Quality  
Analyst  
Lansing District Office  
Office of Drinking Water and  
Municipal Assistance  
517-284-6644

cc: Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5  
Mr. Robert Bincsik, City of Flint  
Mr. Howard Croft, City of Flint  
Mr. Michael Glasgow, City of Flint  
Genesee County Health Department  
Mr. Stephen Busch, DEQ

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, November 07, 2014 10:02 AM  
**To:** Rosenthal, Adam (DEQ)  
**Subject:** Flint tthm lab results

Adam can you email me the PDFs of flint results from may 21 and August 21. Thanks. I need the full results that break down all compounds not just the total

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance MDEQ  
517-643-2314

Sent from my iPhone

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, October 06, 2014 3:02 PM  
**To:** 'Anderson, Madhu (DEQ)'; Brader, Valerie (GOV)  
**Cc:** Thelen, Mary Beth (DEQ) (THELENM2@michigan.gov)  
**Subject:** Flint TTHM letter  
**Attachments:** TTHM - OEL letter.pdf

Valerie and Madhu,

Attached for your convenience is a pdf copy of the DEQ letter to Flint regarding Total Trihalomethanes (TTHM's) discussed during our meeting today.

I have confirmed with our Analyst that the next round of samples is scheduled to be collected in November. They are allowed to collect them any time during the month and analysis takes approximately 1 week to get results back from the lab.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING DISTRICT OFFICE



DAN WYANT  
DIRECTOR

September 10, 2014

Mr. Brent Wright  
City of Flint Water Treatment Plant  
4500 North Dort Highway  
Flint, Michigan 48505

SUBJECT: Compliance Communication  
Total Trihalomethane Operational Evaluation Requested

Under the Stage 2 Disinfectants and Disinfection Byproduct Rule, the City of Flint has been required to collect samples for the analysis of Total Trihalomethane (TTHM) and Haloacetic Acids (HAA5) at eight sites within the City's water distribution system. The City has completed two quarterly monitoring periods since changing its source water to the Flint River effective April 25, 2014.

Normally an Operational Evaluation Level (OEL) would be calculated in accordance with the Michigan Safe Drinking Water Act, Public Act 399, 1976, as amended, Administrative Rule 7196 (R 325.107196), each quarter once three quarters of results have been obtained and compared with the respective maximum contaminant level (MCL) for TTHM. Normally the calculation would be made as follows:

$(2 \times \text{current quarter} + \text{sum of 2 previous quarters}) \text{ divided by } 4$

As the City of Flint currently has only two quarters of data, the calculation has been modified as follows:

$(2 \times \text{current quarter} + \text{previous quarter}) \text{ divided by } 4$

The resulting OEL for each site is listed in the table below. All results are in parts per billion (ppb):

|                                               | 5/21/14 | TTHM<br>8/21/14 | Mod. OEL |    | HAA5<br>8/21/14 | Mod. OEL |
|-----------------------------------------------|---------|-----------------|----------|----|-----------------|----------|
| DBP1 McDonalds<br>3719 Davison                | 162.4   | 145.3           | 113      | 64 | 43              | 38       |
| DBP2 Liquor Palace<br>822 S. Dort Highway     | 111.6   | 112             | 84       | 52 | 40              | 33       |
| DBP3 North Flint Auto<br>3302 S. Dort Highway | 96.5    | 127.2           | 88       | 48 | 31              | 28       |
| DBP4 University Market<br>3606 Corunna        | 106.4   | 181.3           | 117      | 55 | 24              | 26       |
| DBP5 B&P Gas Station<br>2501 Flushing         | 75.1    | 196.2           | 117      | 38 | 17              | 18       |
| DBP6 Salem Housing<br>3216 MLK Boulevard      | 82.2    | 112.4           | 77       | 41 | 25              | 23       |
| DBP7 Kroger<br>5018 Clio Road                 | 88.2    | 144.4           | 94       | 49 | 30              | 27       |
| DBP8 Taco Bell<br>6204 N. Saginaw             | 79.2    | 118.3           | 79       | 50 | 37              | 31       |

Mr. Brent Wright

2

September 10, 2014

As shown in the table above, even with this less restrictive modified method, six of the City's eight sites already exceed the OEL limit of 80 ppb for TTHM. In addition, the City's two other sites are both more than 95% of the TTHM OEL limit.

The MCL for TTHM and HAA5 is based on a locational running annual average for each site, essentially the average at each site over the four previous quarterly monitoring periods. However, with TTHM levels of this magnitude, it is likely the MCL will be exceeded for at least one of these eight sites from just three quarters of monitoring results. For TTHM, four quarters at the MCL of 80 ppb (4 x 80) would provide 320 ppb allowable. As an example, site DBP1 through just two quarterly monitoring periods has a total of 307 ppb (162+145), leaving only 13 ppb over two more quarterly monitoring periods to maintain compliance with the MCL.

**Therefore, this office is requesting the City of Flint complete an Operational Evaluation in accordance with Administrative Rule 719I (R325.10179I). The Operational Evaluation Report shall be submitted to this office no later than November 28, 2014. The report shall not be limited in scope and shall include the following:**

**Examination of Treatment Operational Practices**

- Changes in source water quality
- Treatment changes
- Storage tank operations
- Excess storage capacity
- Treatment problems that contribute to TTHM formation

**Examination of Distribution Operational Practices**

- Storage tank operations
- Excess storage capacity
- Distribution system flushing

The report shall also include steps the City could consider to minimize future exceedances.

Additional guidance on completing the Operational Evaluation Report, including a number of forms that can be used to gather and evaluate water system information is provided in the United States Environmental Protection Agency's (U.S. EPA) Operational Evaluation Guidance Manual. This document is available on the U.S. EPA's website at the following link:

[http://www.epa.gov/ogwdw/disinfection/stage2/pdfs/draft\\_guide\\_stage2\\_operationalevaluation.pdf](http://www.epa.gov/ogwdw/disinfection/stage2/pdfs/draft_guide_stage2_operationalevaluation.pdf)

Be advised, failure to submit an Operational Evaluation Report by this deadline is a reporting violation subject to Tier 3 Public Notification.

The OEL is an indicator of operational performance. The water system must take proactive steps to be able to comply with the MCL's for TTHM and HAA5. While it is recognized that removal of Total Organic Carbon disinfection byproduct precursors as part of the treatment process has performed above minimum removal requirements under the treatment technique, around 4 parts per million of organic carbon are still present in the treated water and may be leading to additional TTHM formation in the City's distribution system.

While health effects associated with disinfection byproducts contaminants are based on chronic exposure, the City has available alternatives that must be considered to achieve compliance with this drinking water public health standard.

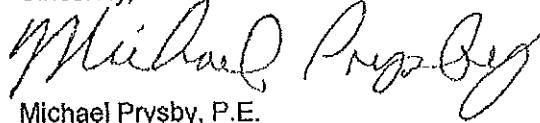
Mr. Brent Wright

3

September 10, 2014

If you have any questions regarding this information, please contact me at the number below.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael Prysby".

Michael Prysby, P.E.  
District Engineer  
Office of Drinking Water and  
Municipal Assistance  
Lansing District Office  
(517) 290-8817

cc: Mr. Darnell Early, City of Flint  
Mr. Daugherty Johnson III, City of Flint  
Mr. Howard Croft, City of Flint  
Mr. Robert Bincsik, City of Flint  
Ms. Liane Shekter Smith, P.E., DEQ  
Mr. Richard Benzie, P.E., DEQ  
Mr. Stephen Busch, P.E., DEQ  
Genesee Co. Health Dept.

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, February 27, 2015 2:00 PM  
**To:** Crooks, Jennifer (crooks.jennifer@epa.gov)  
**Subject:** Flint TTHM Results  
**Attachments:** FLINT TTHM RESULTS.docx

Jennifer,

Attached is the updated TTHM results with the most recent quarterly samples from February 2015.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314



## FLINT TTHM RESULTS

| TTHM Results (mg/L)                          |              |              |              |         |              |              |
|----------------------------------------------|--------------|--------------|--------------|---------|--------------|--------------|
|                                              | 5/21/14      | 8/21/14      | 11/20/14     | 2/17/15 | LRAA         | OEL          |
| DBP1 McDonalds<br>3719 Davison               | <b>0.162</b> | <b>0.145</b> | 0.059        | 0.0162  | <b>0.096</b> | 0.059        |
| DBP2 Liquor Palace<br>3302 S. Dort Highway   | <b>0.112</b> | <b>0.127</b> | 0.033        | 0.0168  | 0.072        | 0.049        |
| DBP3 North Flint Auto<br>6204 N. Saginaw St. | <b>0.097</b> | <b>0.118</b> | 0.041        | 0.0149  | 0.068        | 0.047        |
| DBP4 University Market<br>2501 Flushing Road | <b>0.106</b> | <b>0.196</b> | <b>0.094</b> | 0.0245  | <b>0.105</b> | <b>0.085</b> |
| DBP5 Taco Bell<br>3606 Corunna Road          | 0.079        | <b>0.181</b> | 0.034        | 0.0151  | 0.078        | 0.063        |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road     | <b>0.088</b> | <b>0.144</b> | 0.054        | 0.0192  | 0.076        | 0.059        |
| DBP7 Salem Housing<br>3216 MLK Boulevard     | <b>0.082</b> | <b>0.112</b> | 0.050        | 0.0285  | 0.068        | 0.055        |
| DBP8 BP Gas Station<br>822 S. Dort Highway   | 0.075        | <b>0.112</b> | 0.036        | 0.0199  | 0.061        | 0.047        |

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, March 04, 2015 3:46 PM  
**To:** 'Rennaker, Joanne (DEQ) (RENNAKERJ@michigan.gov)'  
**Cc:** prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** Flint VN letter to final  
**Attachments:** Flint DBP MCL 1Q15.doc

Jo Anne,

Attached is the Flint Violation notice letter.

Please final the letter and have Mike and Adam sign it.

Then scan and email me a signed copy.

I will be emailing Sarah Howes for legislative distribution

Hold off on mailing the letter until the end of the day so we can be sure to allow Sarah time to inform legislative members. Thanks.

Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING DISTRICT OFFICE



DAN WYANT  
DIRECTOR

March 5, 2015 - DRAFT

Mr. Brent Wright, Operation Supervisor  
City Of Flint - DPW  
Flint Water Plant  
4500 North Dort Highway  
Flint, MI 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Violation Notice – Maximum Contaminant Level for Total Trihalomethanes  
Operational Evaluation – Total Trihalomethanes  
1<sup>st</sup> Quarter 2015 Monitoring Period

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the City of Flint is in violation of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels (MCL) for disinfection byproducts*, of the 1979 Administrative Code.

In accordance with R.325.10610, *MCLs for disinfection byproducts*, of the 1979 Administrative Code, the MCL for disinfection byproduct total trihalomethanes (TTHM) is 0.080 milligrams per liter (mg/L) as a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the City of Flint's highest TTHM locational running annual average (LRAA), based on the last four quarters, ending February 28, 2015, is 0.105 mg/l which exceeds the standard, and that two of the eight sample site locations exceed the standard of 0.080 mg/L.

Further, in accordance with R325.10719l, *Disinfection byproducts: operational evaluation levels*, of the 1979 Administrative Code, when an operational evaluation level (OEL) at a monitoring location for TTHM exceeds 0.080 mg/L, a supply shall conduct an operational evaluation and submit a written report of the evaluation to the department not later than 90 days after being notified of the analytical result that causes the supply to exceed the operational evaluation level. As listed in the table below, our records show that TTHM operational evaluation levels for the City of Flint exceed 0.080 mg/L at one of the City's eight sample site locations.

| TTHM Results (mg/L)                          | 5/21/14      | 8/21/14      | 11/20/14     | 2/17/15 | LRAA         | OEL          |
|----------------------------------------------|--------------|--------------|--------------|---------|--------------|--------------|
| DBP1 McDonalds<br>3719 Davison               | <b>0.162</b> | <b>0.145</b> | 0.059        | 0.0162  | <b>0.096</b> | 0.059        |
| DBP2 Liquor Palace<br>3302 S. Dort Highway   | <b>0.112</b> | <b>0.127</b> | 0.033        | 0.0168  | 0.072        | 0.049        |
| DBP3 North Flint Auto<br>6204 N. Saginaw St. | <b>0.097</b> | <b>0.118</b> | 0.041        | 0.0149  | 0.068        | 0.047        |
| DBP4 University Market<br>2501 Flushing Road | <b>0.106</b> | <b>0.196</b> | <b>0.094</b> | 0.0245  | <b>0.105</b> | <b>0.085</b> |
| DBP5 Taco Bell<br>3606 Corunna Road          | 0.079        | <b>0.181</b> | 0.034        | 0.0151  | 0.078        | 0.063        |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road     | <b>0.088</b> | <b>0.144</b> | 0.054        | 0.0192  | 0.076        | 0.059        |
| DBP7 Salem Housing<br>3216 MLK Boulevard     | <b>0.082</b> | <b>0.112</b> | 0.050        | 0.0285  | 0.068        | 0.055        |
| DBP8 BP Gas Station<br>822 S. Dort Highway   | 0.075        | <b>0.112</b> | 0.036        | 0.0199  | 0.061        | 0.047        |

Our investigation consisted of a review of ODWMA files for laboratory reports received for compliance monitoring. Our investigation is considered complete. This violation began on March 1, 2015, and will continue until TTHM LRAA is below the MCL at all sample sites.

We are encouraged by the results from the most recent round of compliance samples collected on February 17, 2015, which now show individual TTHM levels at less than half of the 0.080 mg/L standard at all locations throughout the City's system. Operational Evaluation Reports from December 2014 and February 2015 have identified possible causes and corrective measures for the previous elevated TTHM levels which we encourage the City continue implementing. These modifications have likely contributed in part to the reduction in TTHM levels reported in the most recent quarter, and suggest the City may be able to achieve compliance with the TTHM standard at all sites by continuing these efforts.

Our office is currently reviewing the Operational Evaluation report dated February 27, 2015, and will provide the City and their consultant comments as needed to help address this MCL violation.

Water systems that exceed the OEL must complete and submit an Operational Evaluation in accordance with Administrative Rule 719I (R325.10719I) within 90 days of being notified of the violation. **An updated Operational Evaluation report, which incorporates the most recent sample results, must now be completed and received by our office by no later than Friday May 29, 2015.**

If you have any other factual information you would like us to consider regarding the violation identified in this Violation Notice (VN), please provide them in a written response by March 19, 2015.

Administrative rule R 325.10403 of Act 399 requires that suppliers provide public notice (PN) as soon as practical, but no later than thirty (30) days after the supplier learns of

this type of violation, by mail or direct delivery **and** by any other means reasonably calculated to reach customers not normally reached by mail. Enclosed is a sample PN which contains the minimum required language. The City is encouraged to include additional information regarding its response efforts to this violation. **Please notify your consumers by April 1, 2015, and send us a signed and dated copy of the notice that you issued within ten (10) days of distributing the public notice.** This violation must also be included in your 2015 Consumer Confidence Report (CCR), due by July 1, 2016. The PN must be repeated every quarter until you no longer exceed the TTHM standard. Failure to issue a PN for this violation will result in a fine of at least \$1,000 per event, with a maximum of \$5,000 per violation.

We anticipate and appreciate your continued cooperation in resolving this matter. If you have any questions regarding this VN, please contact us at the numbers below.

Sincerely,

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Michael F. Prysby, P.E., District Engineer  
Lansing District Office  
Office of Drinking Water & Municipal  
Assistance  
517-290-8817

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Adam Rosenthal, EQA  
Lansing District Office  
Office of Drinking Water & Municipal  
Assistance  
517-284-6644

mfp/ar/jlr  
Enclosure

cc: Mr. Jerry Ambrose, Emergency Manager, City of Flint  
Mr. Daughtry Johnson, City of Flint  
Mr. Howard Croft, City of Flint  
Mr. Robert Bincsik, City of Flint  
Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5  
Genesee County Health Department  
Ms. Liane Shekter Smith, P.E., DEQ  
Mr. Richard Benzie, P.E., DEQ  
Mr. Stephen Busch, P.E., DEQ

## IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

### City of Flint Did Not Meet Treatment Requirements

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (May 21, August 21, November 20 of 2014 and February 17, 2015). The average of the results at **ANY** of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the Maximum Contaminant Level (MCL). The standard for TTHMs is 80 µg/L. The location reporting the highest TTHM level was 105 ug/L; thus, our water system exceeds the TTHM MCL.

#### What should I do?

- There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers.
- You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

#### What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

*People who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.*

#### What is being done?

We are currently working on solutions to correct the problem. We anticipate resolving the problem in 2015. Our most recent individual sample results were all less than half the 80 µg/L standard, however since compliance is calculated using a locational running annual average (LRAA) of the most recent 4 quarters, we are still out of compliance with the MCL at 2 of 8 locations.

For more information, please contact Mr. Brent Wright at 517-787-6537 or the Flint Water Plant at 4500 North Dort Highway, Flint, MI 48505.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by the City of Flint.

---

#### CERTIFICATION:

WSSN: 02310

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

---

Signature

Title

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DEQ.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, October 14, 2014 1:54 PM  
**To:** 'rbincsik@cityofflint.com'  
**Cc:** Brent Wright (bwright@cityofflint.com); prysbym@michigan.gov  
**Subject:** Flint Water Complaint

**Importance:** High

Rob,

We have been forwarded the following complaint information from EPA. Could you please let us know whether you have received their complaint and provide a summary of any action or communication with the complainant? Thanks.

Citizen lives at 324 West Jackson Avenue, Flint, 48505

She states, "Water quality is bad since switching to Flint River. My water stinks like sewage at times. I have developed a cough and rash, brown sediment in sink basins and kitchen sink stays backed up. I have written City Hall Water Dept and Council President for help, but no response."

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, August 07, 2015 6:21 PM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Cc:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** Flint Water Judge Order  
**Importance:** High

I just heard this on the way home. If this holds the City may have to enter bankruptcy.

[http://www.mlive.com/news/flint/index.ssf/2015/08/flint\\_ordered\\_to\\_cut\\_water\\_rat.html#incart\\_river](http://www.mlive.com/news/flint/index.ssf/2015/08/flint_ordered_to_cut_water_rat.html#incart_river)

<http://www.wnem.com/story/29737059/flint-vows-to-appeal-after-judge-stops-water-shut-offs>

<http://www.minbcnews.com/news/story.aspx?id=1240768>

Stephen Busch, P.E.  
MDEQ Lansing District Coordinator  
Office of Drinking Water and Municipal Assistance  
Lansing and Jackson District Supervisor  
517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)



**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, July 06, 2015 3:21 PM  
**To:** 'Hansen, Jeff'  
**Cc:** Matta, Samir (SFMatta@lan-inc.com); JWGreen@lan-inc.com;  
mglasgow@cityofflint.com; Brent Wright (bwright@cityofflint.com);  
prysbym@michigan.gov  
**Subject:** Flint WTP GAC Permit Application

Our office received the permit application "Flint WTP Phase II, Segment 3 Filter Media Replacement" on June 30, 2015.

The only specifications provided with the permit application were for the following:

- 05550 Bolts, Anchor Bolts And Expansion Anchors
- 09928 Protective Coating Systems

Aside from information shown on the plan sheets and what was listed in the previously submitted basis of design document, no other specifications were provided regarding:

- GAC and Sand media, including removal, installation, ripening, and disinfection procedures
- Chlorine piping, joints, valves, installation, support, etc.
- Water tight hatch to be installed
- Chlorine gas detector equipment

Regarding the Protective Coating Systems specs and their related appendix, these are general in nature listing every part of the plant as potentially being recoated. Plan notes discuss a few items to be coated/recoated, but it is not entirely clear what the full scope of the coating work will consist of.

We request any additional specification information regarding the above be provided for approval.

It is also noted that the basis of design is based on a flow of 30 MGD, approximately 2.5 gpm/ft<sup>2</sup> filter loading rate. The existing filters are currently rated for 36 MGD at 3 gpm/ft<sup>2</sup>. This would cause the WTP capacity rating to be lowered to 30 MGD. Any future request to expand filter capacity back to 36 MGD would need to be demonstrated through filter performance testing.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, March 11, 2014 12:58 PM  
**To:** Daugherty Johnson (djohnson@cityofflint.com); Brent Wright (bwright@cityofflint.com)  
**Subject:** Flint WTP Groundbreaking

Thanks for the invitation to the WTP groundbreaking. Unfortunately, I have a prior engagement already scheduled for that day and will not be able to attend. Hopefully you will be able to break into sand and not snow!

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, October 01, 2015 5:27 PM  
**To:** Tommasulo, Karen (DEQ)  
**Cc:** Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** Flint WTP Lead Samples  
**Attachments:** 7Laboratory Sample Report.htm; 3Laboratory Sample Report.htm; 6Laboratory Sample Report.htm; 2Laboratory Sample Report.htm; 1Laboratory Sample Report.htm; 4Laboratory Sample Report.htm; 5Laboratory Sample Report.htm

Karen,

The Flint WTP treated water plant tap shows non-detect lead results. The sample dates were:

8/11/2015 Non-detect  
5/12/2015 Non-detect  
2/16/2015 Non-detect  
1/22/2015 Non-detect  
10/28/2014 Non-detect  
8/6/2014 Non-detect  
5/22/2014 Non-detect

Stephen Busch, P.E.  
MDEQ Lansing District Coordinator  
Office of Drinking Water and Municipal Assistance  
Lansing and Jackson District Supervisor  
517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)



## Michigan Department of Environmental Quality

### Replicate Laboratory Report for Lansing Drinking Water Laboratory

**Owner/Location Information:**

CITY OF FLINT  
4500 N DORT HWY  
FLINT MI 48505

Sample Number: LLF44687

**Sample/Collection Information:**

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 10/28/2014 8:04:00 AM

Arrival Date: 10/29/2014 11:15:14 AM

Site Code:

Water Source: Public Community Water Supply

Sample Reason: Routine Monitoring

Sample Point: Treated Public Distribution System

Point Description: PLANT TAP

Collector: Public Water Supply Operator

Collected By: MIKE GLASGOW

| CasNo      | Analyte              | Result | Detect | Units | Method       |
|------------|----------------------|--------|--------|-------|--------------|
| 16984-48-8 | FLUORIDE (AUTOMATED) | 0.62   | 0.1    | mg/L  | SM 4500 FC   |
| 7439-89-6  | IRON                 | ND     | 0.1    | mg/L  | SM 3500 FeB  |
| HARD-00-C  | HARDNESS AS CaCO3    | 143    | 20     | mg/L  | SM 2340 C    |
| 7440-23-5  | SODIUM               | 18     | 5      | mg/L  | SM 3500 NaB  |
| 7440-38-2  | ARSENIC (TOTAL)      | ND     | 0.002  | mg/L  | EPA 200.8    |
| 7440-39-3  | BARIUM               | 0.02   | 0.01   | mg/L  | EPA 200.8    |
| 7440-41-7  | BERYLLIUM            | ND     | 0.0004 | mg/L  | EPA 200.8    |
| 57-12-5    | CYANIDE              | ND     | 0.02   | mg/L  | OIA-1677     |
| 7440-43-9  | CADMIUM (TOTAL)      | ND     | 0.0003 | mg/L  | EPA 200.8    |
| 7647-14-5  | CHLORIDE (AUTOMATED) | 60     | 4      | mg/L  | SM 4500-Cl E |
| 7440-47-3  | CHROMIUM (TOTAL)     | ND     | 0.01   | mg/L  | EPA 200.8    |

|            |                                       |    |         |      |           |
|------------|---------------------------------------|----|---------|------|-----------|
| 93-76-5    | 2,4,5-T                               | ND | 0.002   | mg/L | EPA 515.4 |
| 93-72-1    | 2,4,5-TP (SILVEX)                     | ND | 0.0003  | mg/L | EPA 515.4 |
| 94-75-7    | 2,4-D                                 | ND | 0.002   | mg/L | EPA 515.4 |
| 50594-66-6 | ACIFLUORFEN                           | ND | 0.004   | mg/L | EPA 515.4 |
| 25057-89-0 | BENTAZON                              | ND | 0.002   | mg/L | EPA 515.4 |
| 1918-00-9  | DICAMBA                               | ND | 0.002   | mg/L | EPA 515.4 |
| 88-85-7    | DINOSEB                               | ND | 0.0003  | mg/L | EPA 515.4 |
| 87-86-5    | PENTACHLOROPHENOL                     | ND | 0.00006 | mg/L | EPA 515.4 |
| 1918-02-1  | PICLORAM                              | ND | 0.001   | mg/L | EPA 515.4 |
| 1861-32-1  | TOTAL DCPA, MONO & DI-ACID DEGRADATES | ND | 0.001   | mg/L | EPA 515.4 |
| 116-06-3   | ALDICARB                              | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-88-4  | ALDICARB SULFONE                      | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-87-3  | ALDICARB SULFOXIDE                    | ND | 0.0005  | mg/L | EPA 531.2 |
| 63-25-2    | CARBARYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 1563-66-2  | CARBOFURAN                            | ND | 0.0005  | mg/L | EPA 531.2 |
| 16655-82-6 | HYDROXYCARBOFURAN,3-                  | ND | 0.001   | mg/L | EPA 531.2 |
| 2032-65-7  | METHIOCARB                            | ND | 0.001   | mg/L | EPA 531.2 |
| 16752-77-5 | METHOMYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 23135-22-0 | OXAMYL                                | ND | 0.001   | mg/L | EPA 531.2 |
| 114-26-1   | PROPOXUR (BAYGON)                     | ND | 0.001   | mg/L | EPA 531.2 |
| 34256-82-1 | ACETOCHLOR                            | ND | 0.001   | mg/L | EPA 525.2 |
| 15972-60-8 | ALACHLOR                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 309-00-2   | ALDRIN                                | ND | 0.0004  | mg/L | EPA 525.2 |
| 1912-24-9  | ATRAZINE                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-71-9  | CHLORDANE, ALPHA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-74-2  | CHLORDANE, GAMMA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 72-54-8    | DDD,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |
| 72-55-9    | DDE,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |

|            |                                   |    |        |      |           |
|------------|-----------------------------------|----|--------|------|-----------|
| 50-29-3    | DDT,4,4'-                         | ND | 0.0005 | mg/L | EPA 525.2 |
| 60-57-1    | DIELDRIN                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 72-20-8    | ENDRIN                            | ND | 0.0001 | mg/L | EPA 525.2 |
| 7421-93-4  | ENDRIN ALDEHYDE                   | ND | 0.001  | mg/L | EPA 525.2 |
| 76-44-8    | HEPTACHLOR                        | ND | 0.0002 | mg/L | EPA 525.2 |
| 1024-57-3  | HEPTACHLOR EPOXIDE                | ND | 0.0001 | mg/L | EPA 525.2 |
| 118-74-1   | HEXACHLOROBENZENE                 | ND | 0.0001 | mg/L | EPA 525.2 |
| 319-84-6   | HEXACHLOROCYCLOHEXANE (ALPHA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 319-85-7   | HEXACHLOROCYCLOHEXANE (BETA-BHC)  | ND | 0.001  | mg/L | EPA 525.2 |
| 319-86-8   | HEXACHLOROCYCLOHEXANE (DELTA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 77-47-4    | HEXACHLOROCYCLOPENTADIENE         | ND | 0.0005 | mg/L | EPA 525.2 |
| 58-89-9    | LINDANE (GAMMA-BHC)               | ND | 0.0001 | mg/L | EPA 525.2 |
| 72-43-5    | METHOXYCHLOR                      | ND | 0.0001 | mg/L | EPA 525.2 |
| 51218-45-2 | METOLACHLOR                       | ND | 0.001  | mg/L | EPA 525.2 |
| 21087-64-9 | METRIBUZIN                        | ND | 0.001  | mg/L | EPA 525.2 |
| 2212-67-1  | MOLINATE                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 12674-11-2 | PCB (AROCLOR 1016)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11104-28-2 | PCB (AROCLOR 1221)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11141-16-5 | PCB (AROCLOR 1232)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 53469-21-9 | PCB (AROCLOR 1242)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 12672-29-6 | PCB (AROCLOR 1248)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11097-69-1 | PCB (AROCLOR 1254)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11096-82-5 | PCB (AROCLOR 1260)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 59536-65-1 | POLYBROMINATED BIPHENYLS          | ND | 0.0001 | mg/L | EPA 525.2 |
| 122-34-9   | SIMAZINE                          | ND | 0.0002 | mg/L | EPA 525.2 |
| 8001-35-2  | TOXAPHENE                         | ND | 0.001  | mg/L | EPA 525.2 |
| 71-43-2    | BENZENE                           | ND | 0.0005 | mg/L | EPA 524.2 |
| 108-86-1   | BROMOBENZENE                      | ND | 0.0005 | mg/L | EPA 524.2 |

|            |                            |        |        |      |           |
|------------|----------------------------|--------|--------|------|-----------|
| 74-97-5    | BROMOCHLOROMETHANE         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-25-2    | BROMOFORM                  | 0.0014 | 0.0005 | mg/L | EPA 524.2 |
| 74-83-9    | BROMOMETHANE               | ND     | 0.001  | mg/L | EPA 524.2 |
| 104-51-8   | BUTYLBENZENE,NORMAL-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 135-98-8   | BUTYLBENZENE,SEC-          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-06-6    | BUTYLBENZENE,TERT-         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 56-23-5    | CARBON TETRACHLORIDE       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 108-90-7   | CHLOROBENZENE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 124-48-1   | CHLORODIBROMOMETHANE       | 0.0080 | 0.0005 | mg/L | EPA 524.2 |
| 75-00-3    | CHLOROETHANE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 67-66-3    | CHLOROFORM                 | 0.012  | 0.0005 | mg/L | EPA 524.2 |
| 74-87-3    | CHLOROMETHANE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-49-8    | CHLOROTOLUENE,2-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-43-4   | CHLOROTOLUENE,4-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 74-95-3    | DIBROMOMETHANE             | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-50-1    | DICHLOROBENZENE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 541-73-1   | DICHLOROBENZENE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-46-7   | DICHLOROBENZENE,1,4-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-27-4    | DICHLOROBROMOMETHANE       | 0.012  | 0.0005 | mg/L | EPA 524.2 |
| 75-71-8    | DICHLORODIFLUOROMETHANE    | ND     | 0.001  | mg/L | EPA 524.2 |
| 75-34-3    | DICHLOROETHANE,1,1-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 107-06-2   | DICHLOROETHANE,1,2-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-35-4    | DICHLOROETHYLENE,1,1-      | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-59-2   | DICHLOROETHYLENE,1,2-CIS   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-60-5   | DICHLOROETHYLENE,1,2-TRANS | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-87-5    | DICHLOROPROPANE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 142-28-9   | DICHLOROPROPANE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 594-20-7   | DICHLOROPROPANE,2,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 563-58-6   | DICHLOROPROPENE,1,1-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-01-5 | DICHLOROPROPENE,1,3-CIS    | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-02-6 | DICHLOROPROPENE,1,3-TRANS  | ND     | 0.0005 | mg/L | EPA 524.2 |
| 100-41-4   | ETHYLBENZENE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-69-4    | FLUOROTRICHLOROMETHANE     | ND     | 0.001  | mg/L | EPA 524.2 |
| 87-68-3    | HEXACHLOROBUTADIENE        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-82-8    | ISOPROPYL BENZENE          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 99-87-6    | ISOPROPYL TOLUENE, PARA-   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-93-3    | METHYL ETHYL KETONE        | ND     | 0.005  | mg/L | EPA 524.2 |
| 108-10-1   | METHYL ISOBUTYL KETONE     | ND     | 0.005  | mg/L | EPA 524.2 |
| 1634-04-4  | METHYL TERT-BUTYL ETHER    | ND     | 0.001  | mg/L | EPA 524.2 |

|            |                            |        |        |      |               |
|------------|----------------------------|--------|--------|------|---------------|
| 75-09-2    | METHYLENE CHLORIDE         | ND     | 0.0006 | mg/L | EPA 524.2     |
| 91-20-3    | NAPHTHALENE                | ND     | 0.0005 | mg/L | EPA 524.2     |
| 98-95-3    | NITROBENZENE               | ND     | 0.01   | mg/L | EPA 524.2     |
| 103-65-1   | PROPYLBENZENE, NORMAL-     | ND     | 0.0005 | mg/L | EPA 524.2     |
| 100-42-5   | STYRENE                    | ND     | 0.0005 | mg/L | EPA 524.2     |
| 630-20-6   | TETRACHLOROETHANE,1,1,1,2- | ND     | 0.0005 | mg/L | EPA 524.2     |
| 79-34-5    | TETRACHLOROETHANE,1,1,2,2- | ND     | 0.0005 | mg/L | EPA 524.2     |
| 127-18-4   | TETRACHLOROETHYLENE        | ND     | 0.0005 | mg/L | EPA 524.2     |
| 109-99-9   | TETRAHYDROFURAN            | ND     | 0.005  | mg/L | EPA 524.2     |
| 108-88-3   | TOLUENE                    | ND     | 0.0005 | mg/L | EPA 524.2     |
| TTHM-00-C  | TOTAL TRIHALOMETHANES      | 0.033  | NA     | mg/L | EPA 524.2     |
| 87-61-6    | TRICHLOROBENZENE,1,2,3-    | ND     | 0.0005 | mg/L | EPA 524.2     |
| 120-82-1   | TRICHLOROBENZENE,1,2,4-    | ND     | 0.0005 | mg/L | EPA 524.2     |
| 71-55-6    | TRICHLOROETHANE,1,1,1-     | ND     | 0.0005 | mg/L | EPA 524.2     |
| 79-00-5    | TRICHLOROETHANE,1,1,2-     | ND     | 0.0005 | mg/L | EPA 524.2     |
| 79-01-6    | TRICHLOROETHYLENE          | ND     | 0.0005 | mg/L | EPA 524.2     |
| 96-18-4    | TRICHLOROPROPANE,1,2,3-    | ND     | 0.0005 | mg/L | EPA 524.2     |
| 95-63-6    | TRIMETHYLBENZENE,1,2,4-    | ND     | 0.0005 | mg/L | EPA 524.2     |
| 108-67-8   | TRIMETHYLBENZENE,1,3,5-    | ND     | 0.0005 | mg/L | EPA 524.2     |
| 75-01-4    | VINYL CHLORIDE             | ND     | 0.0004 | mg/L | EPA 524.2     |
| XYLMP-00-C | XYLENE,META-&PARA-         | 0.0005 | 0.0005 | mg/L | EPA 524.2     |
| 95-47-6    | XYLENE,ORTHO-              | ND     | 0.0005 | mg/L | EPA 524.2     |
| 1330-20-7  | XYLENES (TOTAL)            | 0.0005 | NA     | mg/L | EPA 524.2     |
| 7439-97-6  | MERCURY                    | ND     | 0.0001 | mg/L | EPA 200.8     |
| 7440-02-0  | NICKEL                     | ND     | 0.01   | mg/L | EPA 200.8     |
| 14797-65-0 | NITRITE AS N (AUTOMATED)   | ND     | 0.05   | mg/L | 10-107-04-2-B |
| 14797-55-8 | NITRATE AS N (AUTOMATED)   | ND     | 0.4    | mg/L | 10-107-04-2-B |
| 7439-92-1  | LEAD (TOTAL)               | ND     | 0.001  | mg/L | EPA 200.8     |
| 7440-36-0  | ANTIMONY                   | ND     | 0.0006 | mg/L | EPA 200.8     |
| 7782-49-2  | SELENIUM (TOTAL)           | ND     | 0.001  | mg/L | EPA 200.8     |
| 14808-79-8 | SULFATE (AUTOMATED)        | 22     | 10     | mg/L | SM 4500 SO4E  |
| 7440-28-0  | THALLIUM                   | ND     | 0.0002 | mg/L | EPA 200.8     |



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**Laboratory Comments:**

A trip blank was not available for analysis with this sample.

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1  
17:16:11 EDT 2015



## Michigan Department of Environmental Quality

### Replicate Laboratory Report for Lansing Drinking Water Laboratory

**Owner/Location Information:**

CITY OF FLINT  
4500 N DORT HWY  
FLINT MI 48505

Sample Number: LLF54660

**Sample/Collection Information:**

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 2/16/2015 9:40:00 AM

Arrival Date: 2/17/2015 10:46:51 AM

Site Code:

Water Source: Public Community Water Supply

Sample Reason: Routine Monitoring

Sample Point: Treated Public Distribution System

Point Description: PLANT TAP

Collector: Public Water Supply Operator

Collected By: MIKE GLASGOW

| CasNo      | Analyte                       | Result | Detect | Units | Method       |
|------------|-------------------------------|--------|--------|-------|--------------|
| 16984-48-8 | FLUORIDE (AUTOMATED)          | 0.57   | 0.1    | mg/L  | SM 4500 FC   |
| 7439-89-6  | IRON                          | ND     | 0.1    | mg/L  | SM 3500 FeB  |
| HARD-00-C  | HARDNESS AS CaCO <sub>3</sub> | 180    | 20     | mg/L  | SM 2340 C    |
| 7440-23-5  | SODIUM                        | 25     | 5      | mg/L  | SM 3500 NaB  |
| 7440-38-2  | ARSENIC (TOTAL)               | ND     | 0.002  | mg/L  | EPA 200.8    |
| 7440-39-3  | BARIUM                        | ND     | 0.01   | mg/L  | EPA 200.8    |
| 7440-41-7  | BERYLLIUM                     | ND     | 0.0004 | mg/L  | EPA 200.8    |
| 57-12-5    | CYANIDE                       | ND     | 0.02   | mg/L  | OIA-1677     |
| 7440-43-9  | CADMIUM (TOTAL)               | ND     | 0.0003 | mg/L  | EPA 200.8    |
| 7647-14-5  | CHLORIDE (AUTOMATED)          | 99     | 4      | mg/L  | SM 4500-Cl E |
| 7440-47-3  | CHROMIUM (TOTAL)              | ND     | 0.01   | mg/L  | EPA 200.8    |

|            |                                       |    |         |      |           |
|------------|---------------------------------------|----|---------|------|-----------|
| 93-76-5    | 2,4,5-T                               | ND | 0.002   | mg/L | EPA 515.4 |
| 93-72-1    | 2,4,5-TP (SILVEX)                     | ND | 0.0002  | mg/L | EPA 515.4 |
| 94-75-7    | 2,4-D                                 | ND | 0.001   | mg/L | EPA 515.4 |
| 50594-66-6 | ACIFLUORFEN                           | ND | 0.004   | mg/L | EPA 515.4 |
| 25057-89-0 | BENTAZON                              | ND | 0.002   | mg/L | EPA 515.4 |
| 1918-00-9  | DICAMBA                               | ND | 0.002   | mg/L | EPA 515.4 |
| 88-85-7    | DINOSEB                               | ND | 0.0002  | mg/L | EPA 515.4 |
| 87-86-5    | PENTACHLOROPHENOL                     | ND | 0.00004 | mg/L | EPA 515.4 |
| 1918-02-1  | PICLORAM                              | ND | 0.001   | mg/L | EPA 515.4 |
| 1861-32-1  | TOTAL DCPA, MONO & DI-ACID DEGRADATES | ND | 0.001   | mg/L | EPA 515.4 |
| 116-06-3   | ALDICARB                              | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-88-4  | ALDICARB SULFONE                      | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-87-3  | ALDICARB SULFOXIDE                    | ND | 0.0005  | mg/L | EPA 531.2 |
| 63-25-2    | CARBARYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 1563-66-2  | CARBOFURAN                            | ND | 0.0005  | mg/L | EPA 531.2 |
| 16655-82-6 | HYDROXYCARBOFURAN,3-                  | ND | 0.001   | mg/L | EPA 531.2 |
| 2032-65-7  | METHIOCARB                            | ND | 0.001   | mg/L | EPA 531.2 |
| 16752-77-5 | METHOMYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 23135-22-0 | OXAMYL                                | ND | 0.001   | mg/L | EPA 531.2 |
| 114-26-1   | PROPOXUR (BAYGON)                     | ND | 0.001   | mg/L | EPA 531.2 |
| 34256-82-1 | ACETOCHLOR                            | ND | 0.001   | mg/L | EPA 525.2 |
| 15972-60-8 | ALACHLOR                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 309-00-2   | ALDRIN                                | ND | 0.0004  | mg/L | EPA 525.2 |
| 1912-24-9  | ATRAZINE                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-71-9  | CHLORDANE, ALPHA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-74-2  | CHLORDANE, GAMMA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 72-54-8    | DDD,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |
| 72-55-9    | DDE,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |

|            |                                   |    |        |      |           |
|------------|-----------------------------------|----|--------|------|-----------|
| 50-29-3    | DDT,4,4'-                         | ND | 0.0005 | mg/L | EPA 525.2 |
| 60-57-1    | DIELDRIN                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 72-20-8    | ENDRIN                            | ND | 0.0001 | mg/L | EPA 525.2 |
| 7421-93-4  | ENDRIN ALDEHYDE                   | ND | 0.001  | mg/L | EPA 525.2 |
| 76-44-8    | HEPTACHLOR                        | ND | 0.0002 | mg/L | EPA 525.2 |
| 1024-57-3  | HEPTACHLOR EPOXIDE                | ND | 0.0001 | mg/L | EPA 525.2 |
| 118-74-1   | HEXACHLOROBENZENE                 | ND | 0.0001 | mg/L | EPA 525.2 |
| 319-84-6   | HEXACHLOROCYCLOHEXANE (ALPHA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 319-85-7   | HEXACHLOROCYCLOHEXANE (BETA-BHC)  | ND | 0.001  | mg/L | EPA 525.2 |
| 319-86-8   | HEXACHLOROCYCLOHEXANE (DELTA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 77-47-4    | HEXACHLOROCYCLOPENTADIENE         | ND | 0.0005 | mg/L | EPA 525.2 |
| 58-89-9    | LINDANE (GAMMA-BHC)               | ND | 0.0001 | mg/L | EPA 525.2 |
| 72-43-5    | METHOXYCHLOR                      | ND | 0.0001 | mg/L | EPA 525.2 |
| 51218-45-2 | METOLACHLOR                       | ND | 0.001  | mg/L | EPA 525.2 |
| 21087-64-9 | METRIBUZIN                        | ND | 0.001  | mg/L | EPA 525.2 |
| 2212-67-1  | MOLINATE                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 12674-11-2 | PCB (AROCLOR 1016)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11104-28-2 | PCB (AROCLOR 1221)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11141-16-5 | PCB (AROCLOR 1232)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 53469-21-9 | PCB (AROCLOR 1242)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 12672-29-6 | PCB (AROCLOR 1248)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11097-69-1 | PCB (AROCLOR 1254)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11096-82-5 | PCB (AROCLOR 1260)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 59536-65-1 | POLYBROMINATED BIPHENYLS          | ND | 0.0001 | mg/L | EPA 525.2 |
| 122-34-9   | SIMAZINE                          | ND | 0.0002 | mg/L | EPA 525.2 |
| 8001-35-2  | TOXAPHENE                         | ND | 0.001  | mg/L | EPA 525.2 |
| 71-43-2    | BENZENE                           | ND | 0.0005 | mg/L | EPA 524.2 |
| 108-86-1   | BROMOBENZENE                      | ND | 0.0005 | mg/L | EPA 524.2 |

|            |                            |        |        |      |           |
|------------|----------------------------|--------|--------|------|-----------|
| 74-97-5    | BROMOCHLOROMETHANE         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-25-2    | BROMOFORM                  | 0.0007 | 0.0005 | mg/L | EPA 524.2 |
| 74-83-9    | BROMOMETHANE               | ND     | 0.001  | mg/L | EPA 524.2 |
| 104-51-8   | BUTYLBENZENE,NORMAL-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 135-98-8   | BUTYLBENZENE,SEC-          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-06-6    | BUTYLBENZENE,TERT-         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 56-23-5    | CARBON TETRACHLORIDE       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 108-90-7   | CHLOROBENZENE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 124-48-1   | CHLORODIBROMOMETHANE       | 0.0025 | 0.0005 | mg/L | EPA 524.2 |
| 75-00-3    | CHLOROETHANE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 67-66-3    | CHLOROFORM                 | 0.0018 | 0.0005 | mg/L | EPA 524.2 |
| 74-87-3    | CHLOROMETHANE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-49-8    | CHLOROTOLUENE,2-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-43-4   | CHLOROTOLUENE,4-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 74-95-3    | DIBROMOMETHANE             | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-50-1    | DICHLOROBENZENE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 541-73-1   | DICHLOROBENZENE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-46-7   | DICHLOROBENZENE,1,4-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-27-4    | DICHLOROBROMOMETHANE       | 0.0030 | 0.0005 | mg/L | EPA 524.2 |
| 75-71-8    | DICHLORODIFLUOROMETHANE    | ND     | 0.001  | mg/L | EPA 524.2 |
| 75-34-3    | DICHLOROETHANE,1,1-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 107-06-2   | DICHLOROETHANE,1,2-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-35-4    | DICHLOROETHYLENE,1,1-      | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-59-2   | DICHLOROETHYLENE,1,2-CIS   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-60-5   | DICHLOROETHYLENE,1,2-TRANS | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-87-5    | DICHLOROPROPANE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 142-28-9   | DICHLOROPROPANE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 594-20-7   | DICHLOROPROPANE,2,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 563-58-6   | DICHLOROPROPENE,1,1-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-01-5 | DICHLOROPROPENE,1,3-CIS    | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-02-6 | DICHLOROPROPENE,1,3-TRANS  | ND     | 0.0005 | mg/L | EPA 524.2 |
| 100-41-4   | ETHYLBENZENE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-69-4    | FLUOROTRICHLOROMETHANE     | ND     | 0.001  | mg/L | EPA 524.2 |
| 87-68-3    | HEXACHLOROBUTADIENE        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-82-8    | ISOPROPYL BENZENE          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 99-87-6    | ISOPROPYL TOLUENE, PARA-   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-93-3    | METHYL ETHYL KETONE        | ND     | 0.005  | mg/L | EPA 524.2 |
| 108-10-1   | METHYL ISOBUTYL KETONE     | ND     | 0.005  | mg/L | EPA 524.2 |
| 1634-04-4  | METHYL TERT-BUTYL ETHER    | ND     | 0.001  | mg/L | EPA 524.2 |

|            |                            |       |        |      |               |
|------------|----------------------------|-------|--------|------|---------------|
| 75-09-2    | METHYLENE CHLORIDE         | ND    | 0.0006 | mg/L | EPA 524.2     |
| 91-20-3    | NAPHTHALENE                | ND    | 0.0005 | mg/L | EPA 524.2     |
| 103-65-1   | PROPYLBENZENE, NORMAL-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 100-42-5   | STYRENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 630-20-6   | TETRACHLOROETHANE,1,1,1,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-34-5    | TETRACHLOROETHANE,1,1,2,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 127-18-4   | TETRACHLOROETHYLENE        | ND    | 0.0005 | mg/L | EPA 524.2     |
| 109-99-9   | TETRAHYDROFURAN            | ND    | 0.005  | mg/L | EPA 524.2     |
| 108-88-3   | TOLUENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| TTHM-00-C  | TOTAL TRIHALOMETHANES      | 0.008 | NA     | mg/L | EPA 524.2     |
| 87-61-6    | TRICHLOROBENZENE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 120-82-1   | TRICHLOROBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 71-55-6    | TRICHLOROETHANE,1,1,1-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-00-5    | TRICHLOROETHANE,1,1,2-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-01-6    | TRICHLOROETHYLENE          | ND    | 0.0005 | mg/L | EPA 524.2     |
| 96-18-4    | TRICHLOROPROPANE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-63-6    | TRIMETHYLBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 108-67-8   | TRIMETHYLBENZENE,1,3,5-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 75-01-4    | VINYL CHLORIDE             | ND    | 0.0005 | mg/L | EPA 524.2     |
| XYLMP-00-C | XYLENE,META-&PARA-         | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-47-6    | XYLENE,ORTHO-              | ND    | 0.0005 | mg/L | EPA 524.2     |
| 1330-20-7  | XYLENES (TOTAL)            | ND    | NA     | mg/L | EPA 524.2     |
| 7439-97-6  | MERCURY                    | ND    | 0.0001 | mg/L | EPA 200.8     |
| 7440-02-0  | NICKEL                     | ND    | 0.01   | mg/L | EPA 200.8     |
| 14797-65-0 | NITRITE AS N (AUTOMATED)   | ND    | 0.05   | mg/L | 10-107-04-2-B |
| 14797-55-8 | NITRATE AS N (AUTOMATED)   | 1.3   | 0.4    | mg/L | 10-107-04-2-B |
| 7439-92-1  | LEAD (TOTAL)               | ND    | 0.001  | mg/L | EPA 200.8     |
| 7440-36-0  | ANTIMONY                   | ND    | 0.0006 | mg/L | EPA 200.8     |
| 7782-49-2  | SELENIUM (TOTAL)           | 0.001 | 0.001  | mg/L | EPA 200.8     |
| 14808-79-8 | SULFATE (AUTOMATED)        | 40    | 10     | mg/L | SM 4500 SO4E  |
| 7440-28-0  | THALLIUM                   | ND    | 0.0002 | mg/L | EPA 200.8     |

## Laboratory Comments:

Endrin Aldehyde quality control results were outside allowed limits due to matrix interferences.  
Unidentified hydrocarbon peak(s) were detected.

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1  
17:13:39 EDT 2015



## Michigan Department of Environmental Quality

### Replicate Laboratory Report for Lansing Drinking Water Laboratory

**Owner/Location Information:**

CITY OF FLINT -WATER  
PLANT  
4500 N DORT HWY  
FLINT MI 48505

Sample Number: LLF19430

**Sample/Collection Information:**

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 5/22/2014 8:30:00 AM

Arrival Date: 5/22/2014 1:19:53 PM

Site Code: LAB TAP

Water Source: Public Community Water  
Supply

Sample Reason: Routine Monitoring

Sample Point: Treated Public Distribution  
System

Point Description: PLANT LAB

Collector: Public Water Supply Operator

Collected By: MICHAEL GLASGOW

| CasNo      | Analyte                       | Result | Detect | Units | Method       |
|------------|-------------------------------|--------|--------|-------|--------------|
| 16984-48-8 | FLUORIDE (AUTOMATED)          | 0.16   | 0.1    | mg/L  | SM 4500 FC   |
| 7439-89-6  | IRON                          | ND     | 0.1    | mg/L  | SM 3500 FeB  |
| HARD-00-C  | HARDNESS AS CaCO <sub>3</sub> | 209    | 20     | mg/L  | SM 2340 C    |
| 7440-23-5  | SODIUM                        | 15     | 5      | mg/L  | SM 3500 NaB  |
| 7440-38-2  | ARSENIC (TOTAL)               | ND     | 0.002  | mg/L  | EPA 200.8    |
| 7440-39-3  | BARIUM                        | 0.03   | 0.01   | mg/L  | EPA 200.8    |
| 7440-41-7  | BERYLLIUM                     | ND     | 0.0004 | mg/L  | EPA 200.8    |
| 57-12-5    | CYANIDE                       | ND     | 0.02   | mg/L  | OIA-1677     |
| 7440-43-9  | CADMIUM (TOTAL)               | ND     | 0.0003 | mg/L  | EPA 200.8    |
| 7647-14-5  | CHLORIDE (AUTOMATED)          | 79     | 4      | mg/L  | SM 4500-Cl E |
| 7440-47-   |                               |        |        |       |              |



|            |                                       |    |         |      |           |
|------------|---------------------------------------|----|---------|------|-----------|
| 3          | CHROMIUM (TOTAL)                      | ND | 0.01    | mg/L | EPA 200.8 |
| 93-76-5    | 2,4,5-T                               | ND | 0.002   | mg/L | EPA 515.4 |
| 93-72-1    | 2,4,5-TP (SILVEX)                     | ND | 0.0003  | mg/L | EPA 515.4 |
| 94-75-7    | 2,4-D                                 | ND | 0.002   | mg/L | EPA 515.4 |
| 50594-66-6 | ACIFLUORFEN                           | ND | 0.004   | mg/L | EPA 515.4 |
| 25057-89-0 | BENTAZON                              | ND | 0.002   | mg/L | EPA 515.4 |
| 1918-00-9  | DICAMBA                               | ND | 0.002   | mg/L | EPA 515.4 |
| 88-85-7    | DINOSEB                               | ND | 0.0003  | mg/L | EPA 515.4 |
| 87-86-5    | PENTACHLOROPHENOL                     | ND | 0.00006 | mg/L | EPA 515.4 |
| 1918-02-1  | PICLORAM                              | ND | 0.001   | mg/L | EPA 515.4 |
| 1861-32-1  | TOTAL DCPA, MONO & DI-ACID DEGRADATES | ND | 0.001   | mg/L | EPA 515.4 |
| 116-06-3   | ALDICARB                              | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-88-4  | ALDICARB SULFONE                      | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-87-3  | ALDICARB SULFOXIDE                    | ND | 0.0005  | mg/L | EPA 531.2 |
| 63-25-2    | CARBARYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 1563-66-2  | CARBOFURAN                            | ND | 0.0005  | mg/L | EPA 531.2 |
| 16655-82-6 | HYDROXYCARBOFURAN,3-                  | ND | 0.001   | mg/L | EPA 531.2 |
| 2032-65-7  | METHIOCARB                            | ND | 0.001   | mg/L | EPA 531.2 |
| 16752-77-5 | METHOMYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 23135-22-0 | OXAMYL                                | ND | 0.001   | mg/L | EPA 531.2 |
| 114-26-1   | PROPOXUR (BAYGON)                     | ND | 0.001   | mg/L | EPA 531.2 |
| 34256-82-1 | ACETOCHLOR                            | ND | 0.001   | mg/L | EPA 525.2 |
| 15972-60-8 | ALACHLOR                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 309-00-2   | ALDRIN                                | ND | 0.0004  | mg/L | EPA 525.2 |
| 1912-24-9  | ATRAZINE                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-71-9  | CHLORDANE, ALPHA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-74-2  | CHLORDANE, GAMMA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 72-54-8    | DDD,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |

|            |                                   |    |        |      |           |
|------------|-----------------------------------|----|--------|------|-----------|
| 72-55-9    | DDE,4,4'-                         | ND | 0.001  | mg/L | EPA 525.2 |
| 50-29-3    | DDT,4,4'-                         | ND | 0.0005 | mg/L | EPA 525.2 |
| 60-57-1    | DIELDRIN                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 72-20-8    | ENDRIN                            | ND | 0.0001 | mg/L | EPA 525.2 |
| 7421-93-4  | ENDRIN ALDEHYDE                   | ND | 0.001  | mg/L | EPA 525.2 |
| 76-44-8    | HEPTACHLOR                        | ND | 0.0002 | mg/L | EPA 525.2 |
| 1024-57-3  | HEPTACHLOR EPOXIDE                | ND | 0.0001 | mg/L | EPA 525.2 |
| 118-74-1   | HEXACHLOROBENZENE                 | ND | 0.0001 | mg/L | EPA 525.2 |
| 319-84-6   | HEXACHLOROCYCLOHEXANE (ALPHA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 319-85-7   | HEXACHLOROCYCLOHEXANE (BETA-BHC)  | ND | 0.001  | mg/L | EPA 525.2 |
| 319-86-8   | HEXACHLOROCYCLOHEXANE (DELTA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 77-47-4    | HEXACHLOROCYCLOPENTADIENE         | ND | 0.0005 | mg/L | EPA 525.2 |
| 58-89-9    | LINDANE (GAMMA-BHC)               | ND | 0.0001 | mg/L | EPA 525.2 |
| 72-43-5    | METHOXYCHLOR                      | ND | 0.0001 | mg/L | EPA 525.2 |
| 51218-45-2 | METOLACHLOR                       | ND | 0.001  | mg/L | EPA 525.2 |
| 21087-64-9 | METRIBUZIN                        | ND | 0.001  | mg/L | EPA 525.2 |
| 2212-67-1  | MOLINATE                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 12674-11-2 | PCB (AROCLOR 1016)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11104-28-2 | PCB (AROCLOR 1221)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11141-16-5 | PCB (AROCLOR 1232)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 53469-21-9 | PCB (AROCLOR 1242)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 12672-29-6 | PCB (AROCLOR 1248)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11097-69-1 | PCB (AROCLOR 1254)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11096-82-5 | PCB (AROCLOR 1260)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 59536-65-1 | POLYBROMINATED BIPHENYLS          | ND | 0.0001 | mg/L | EPA 525.2 |
| 122-34-9   | SIMAZINE                          | ND | 0.0002 | mg/L | EPA 525.2 |
| 8001-35-2  | TOXAPHENE                         | ND | 0.001  | mg/L | EPA 525.2 |
| 71-43-2    | BENZENE                           | ND | 0.0005 | mg/L | EPA 524.2 |

|            |                            |        |        |      |           |
|------------|----------------------------|--------|--------|------|-----------|
| 108-86-1   | BROMOBENZENE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 74-97-5    | BROMOCHLOROMETHANE         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-25-2    | BROMOFORM                  | 0.0010 | 0.0005 | mg/L | EPA 524.2 |
| 74-83-9    | BROMOMETHANE               | ND     | 0.001  | mg/L | EPA 524.2 |
| 104-51-8   | BUTYLBENZENE,NORMAL-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 135-98-8   | BUTYLBENZENE,SEC-          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-06-6    | BUTYLBENZENE,TERT-         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 56-23-5    | CARBON TETRACHLORIDE       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 108-90-7   | CHLOROBENZENE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 124-48-1   | CHLORODIBROMOMETHANE       | 0.013  | 0.0005 | mg/L | EPA 524.2 |
| 75-00-3    | CHLOROETHANE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 67-66-3    | CHLOROFORM                 | 0.022  | 0.0005 | mg/L | EPA 524.2 |
| 74-87-3    | CHLOROMETHANE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-49-8    | CHLOROTOLUENE,2-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-43-4   | CHLOROTOLUENE,4-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 74-95-3    | DIBROMOMETHANE             | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-50-1    | DICHLOROBENZENE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 541-73-1   | DICHLOROBENZENE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-46-7   | DICHLOROBENZENE,1,4-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-27-4    | DICHLOROBROMOMETHANE       | 0.020  | 0.0005 | mg/L | EPA 524.2 |
| 75-71-8    | DICHLORODIFLUOROMETHANE    | ND     | 0.001  | mg/L | EPA 524.2 |
| 75-34-3    | DICHLOROETHANE,1,1-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 107-06-2   | DICHLOROETHANE,1,2-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-35-4    | DICHLOROETHYLENE,1,1-      | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-59-2   | DICHLOROETHYLENE,1,2-CIS   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-60-5   | DICHLOROETHYLENE,1,2-TRANS | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-87-5    | DICHLOROPROPANE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 142-28-9   | DICHLOROPROPANE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 594-20-7   | DICHLOROPROPANE,2,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 563-58-6   | DICHLOROPROPENE,1,1-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-01-5 | DICHLOROPROPENE,1,3-CIS    | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-02-6 | DICHLOROPROPENE,1,3-TRANS  | ND     | 0.0005 | mg/L | EPA 524.2 |
| 100-41-4   | ETHYLBENZENE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-69-4    | FLUOROTRICHLOROMETHANE     | ND     | 0.001  | mg/L | EPA 524.2 |
| 87-68-3    | HEXACHLOROBUTADIENE        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-82-8    | ISOPROPYL BENZENE          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 99-87-6    | ISOPROPYL TOLUENE, PARA-   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-93-3    | METHYL ETHYL KETONE        | ND     | 0.005  | mg/L | EPA 524.2 |
| 108-10-1   | METHYL ISOBUTYL KETONE     | ND     | 0.005  | mg/L | EPA 524.2 |
| 1634-04-   |                            |        |        |      |           |

|            |                            |       |        |      |               |
|------------|----------------------------|-------|--------|------|---------------|
| 4          | METHYL TERT-BUTYL ETHER    | ND    | 0.001  | mg/L | EPA 524.2     |
| 75-09-2    | METHYLENE CHLORIDE         | ND    | 0.0006 | mg/L | EPA 524.2     |
| 91-20-3    | NAPHTHALENE                | ND    | 0.0005 | mg/L | EPA 524.2     |
| 98-95-3    | NITROBENZENE               | ND    | 0.01   | mg/L | EPA 524.2     |
| 103-65-1   | PROPYLBENZENE, NORMAL-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 100-42-5   | STYRENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 630-20-6   | TETRACHLOROETHANE,1,1,1,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-34-5    | TETRACHLOROETHANE,1,1,2,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 127-18-4   | TETRACHLOROETHYLENE        | ND    | 0.0005 | mg/L | EPA 524.2     |
| 109-99-9   | TETRAHYDROFURAN            | ND    | 0.005  | mg/L | EPA 524.2     |
| 108-88-3   | TOLUENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| TTHM-00-C  | TOTAL TRIHALOMETHANES      | 0.056 | NA     | mg/L | EPA 524.2     |
| 87-61-6    | TRICHLOROBENZENE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 120-82-1   | TRICHLOROBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 71-55-6    | TRICHLOROETHANE,1,1,1-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-00-5    | TRICHLOROETHANE,1,1,2-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-01-6    | TRICHLOROETHYLENE          | ND    | 0.0005 | mg/L | EPA 524.2     |
| 96-18-4    | TRICHLOROPROPANE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-63-6    | TRIMETHYLBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 108-67-8   | TRIMETHYLBENZENE,1,3,5-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 75-01-4    | VINYL CHLORIDE             | ND    | 0.0004 | mg/L | EPA 524.2     |
| XYLMP-00-C | XYLENE,META-&PARA-         | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-47-6    | XYLENE,ORTHO-              | ND    | 0.0005 | mg/L | EPA 524.2     |
| 1330-20-7  | XYLENES (TOTAL)            | ND    | NA     | mg/L | EPA 524.2     |
| 7439-97-6  | MERCURY                    | ND    | 0.0001 | mg/L | EPA 200.8     |
| 7440-02-0  | NICKEL                     | ND    | 0.01   | mg/L | EPA 200.8     |
| 14797-65-0 | NITRITE AS N (AUTOMATED)   | ND    | 0.05   | mg/L | 10-107-04-2-B |
| 14797-55-8 | NITRATE AS N (AUTOMATED)   | 0.4   | 0.4    | mg/L | 10-107-04-2-B |
| 7439-92-1  | LEAD (TOTAL)               | ND    | 0.001  | mg/L | EPA 200.8     |
| 7440-36-0  | ANTIMONY                   | ND    | 0.0006 | mg/L | EPA 200.8     |
| 7782-49-2  | SELENIUM (TOTAL)           | ND    | 0.001  | mg/L | EPA 200.8     |
| 14808-79-8 | SULFATE (AUTOMATED)        | 25    | 10     | mg/L | SM 4500 SO4E  |
| 7440-28-   |                            |       |        |      |               |

|   |          |    |             |           |
|---|----------|----|-------------|-----------|
| 0 | THALLIUM | ND | 0.0002 mg/L | EPA 200.8 |
|---|----------|----|-------------|-----------|

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## Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1  
17:15:56 EDT 2015



## Michigan Department of Environmental Quality

### Replicate Laboratory Report for Lansing Drinking Water Laboratory

**Owner/Location Information:**

CITY OF FLINT  
4500 N DORT HWY  
FLINT MI 48505

Sample Number: LLF63412

**Sample/Collection Information:**

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 5/12/2015 11:33:00 AM

Arrival Date: 5/13/2015 11:26:43 AM

Site Code:

Water Source: Public Community Water Supply

Sample Reason: Routine Monitoring

Sample Point: Treated Public Distribution System

Point Description: PLANT TAP

Collector: Public Water Supply Operator

Collected By: MIKE GLASGOW

| CasNo      | Analyte              | Result | Detect | Units | Method       |
|------------|----------------------|--------|--------|-------|--------------|
| 16984-48-8 | FLUORIDE (AUTOMATED) | 0.87   | 0.1    | mg/L  | SM 4500 FC   |
| 7439-89-6  | IRON                 | ND     | 0.1    | mg/L  | SM 3500 FeB  |
| HARD-00-C  | HARDNESS AS CaCO3    | 163    | 20     | mg/L  | SM 2340 C    |
| 7440-23-5  | SODIUM               | 18     | 5      | mg/L  | SM 3500 NaB  |
| 7440-38-2  | ARSENIC (TOTAL)      | ND     | 0.002  | mg/L  | EPA 200.8    |
| 7440-39-3  | BARIUM               | 0.03   | 0.01   | mg/L  | EPA 200.8    |
| 7440-41-7  | BERYLLIUM            | ND     | 0.0004 | mg/L  | EPA 200.8    |
| 57-12-5    | CYANIDE              | ND     | 0.02   | mg/L  | OIA-1677     |
| 7440-43-9  | CADMIUM (TOTAL)      | ND     | 0.0003 | mg/L  | EPA 200.8    |
| 7647-14-5  | CHLORIDE (AUTOMATED) | 90     | 4      | mg/L  | SM 4500-Cl E |
| 7440-47-3  | CHROMIUM (TOTAL)     | ND     | 0.01   | mg/L  | EPA 200.8    |

|            |                                       |    |         |      |           |
|------------|---------------------------------------|----|---------|------|-----------|
| 93-76-5    | 2,4,5-T                               | ND | 0.002   | mg/L | EPA 515.4 |
| 93-72-1    | 2,4,5-TP (SILVEX)                     | ND | 0.0002  | mg/L | EPA 515.4 |
| 94-75-7    | 2,4-D                                 | ND | 0.001   | mg/L | EPA 515.4 |
| 50594-66-6 | ACIFLUORFEN                           | ND | 0.004   | mg/L | EPA 515.4 |
| 25057-89-0 | BENTAZON                              | ND | 0.002   | mg/L | EPA 515.4 |
| 1918-00-9  | DICAMBA                               | ND | 0.002   | mg/L | EPA 515.4 |
| 88-85-7    | DINOSEB                               | ND | 0.0002  | mg/L | EPA 515.4 |
| 87-86-5    | PENTACHLOROPHENOL                     | ND | 0.00004 | mg/L | EPA 515.4 |
| 1918-02-1  | PICLORAM                              | ND | 0.001   | mg/L | EPA 515.4 |
| 1861-32-1  | TOTAL DCPA, MONO & DI-ACID DEGRADATES | ND | 0.001   | mg/L | EPA 515.4 |
| 116-06-3   | ALDICARB                              | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-88-4  | ALDICARB SULFONE                      | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-87-3  | ALDICARB SULFOXIDE                    | ND | 0.0005  | mg/L | EPA 531.2 |
| 63-25-2    | CARBARYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 1563-66-2  | CARBOFURAN                            | ND | 0.0005  | mg/L | EPA 531.2 |
| 16655-82-6 | HYDROXYCARBOFURAN,3-                  | ND | 0.001   | mg/L | EPA 531.2 |
| 2032-65-7  | METHIOCARB                            | ND | 0.001   | mg/L | EPA 531.2 |
| 16752-77-5 | METHOMYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 23135-22-0 | OXAMYL                                | ND | 0.001   | mg/L | EPA 531.2 |
| 114-26-1   | PROPOXUR (BAYGON)                     | ND | 0.001   | mg/L | EPA 531.2 |
| 34256-82-1 | ACETOCHLOR                            | ND | 0.001   | mg/L | EPA 525.2 |
| 15972-60-8 | ALACHLOR                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 309-00-2   | ALDRIN                                | ND | 0.0004  | mg/L | EPA 525.2 |
| 1912-24-9  | ATRAZINE                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-71-9  | CHLORDANE, ALPHA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-74-2  | CHLORDANE, GAMMA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 72-54-8    | DDD,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |
| 72-55-9    | DDE,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |

|            |                                   |    |        |      |           |
|------------|-----------------------------------|----|--------|------|-----------|
| 50-29-3    | DDT,4,4'-                         | ND | 0.0005 | mg/L | EPA 525.2 |
| 60-57-1    | DIELDRIN                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 72-20-8    | ENDRIN                            | ND | 0.0001 | mg/L | EPA 525.2 |
| 7421-93-4  | ENDRIN ALDEHYDE                   | ND | 0.001  | mg/L | EPA 525.2 |
| 76-44-8    | HEPTACHLOR                        | ND | 0.0002 | mg/L | EPA 525.2 |
| 1024-57-3  | HEPTACHLOR EPOXIDE                | ND | 0.0001 | mg/L | EPA 525.2 |
| 118-74-1   | HEXACHLOROBENZENE                 | ND | 0.0001 | mg/L | EPA 525.2 |
| 319-84-6   | HEXACHLOROCYCLOHEXANE (ALPHA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 319-85-7   | HEXACHLOROCYCLOHEXANE (BETA-BHC)  | ND | 0.001  | mg/L | EPA 525.2 |
| 319-86-8   | HEXACHLOROCYCLOHEXANE (DELTA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 77-47-4    | HEXACHLOROCYCLOPENTADIENE         | ND | 0.0005 | mg/L | EPA 525.2 |
| 58-89-9    | LINDANE (GAMMA-BHC)               | ND | 0.0001 | mg/L | EPA 525.2 |
| 72-43-5    | METHOXYCHLOR                      | ND | 0.0001 | mg/L | EPA 525.2 |
| 51218-45-2 | METOLACHLOR                       | ND | 0.001  | mg/L | EPA 525.2 |
| 21087-64-9 | METRIBUZIN                        | ND | 0.001  | mg/L | EPA 525.2 |
| 2212-67-1  | MOLINATE                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 12674-11-2 | PCB (AROCLOR 1016)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11104-28-2 | PCB (AROCLOR 1221)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11141-16-5 | PCB (AROCLOR 1232)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 53469-21-9 | PCB (AROCLOR 1242)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 12672-29-6 | PCB (AROCLOR 1248)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11097-69-1 | PCB (AROCLOR 1254)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11096-82-5 | PCB (AROCLOR 1260)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 59536-65-1 | POLYBROMINATED BIPHENYLS          | ND | 0.0001 | mg/L | EPA 525.2 |
| 122-34-9   | SIMAZINE                          | ND | 0.0002 | mg/L | EPA 525.2 |
| 8001-35-2  | TOXAPHENE                         | ND | 0.001  | mg/L | EPA 525.2 |
| 71-43-2    | BENZENE                           | ND | 0.0005 | mg/L | EPA 524.2 |
| 108-86-1   | BROMOBENZENE                      | ND | 0.0005 | mg/L | EPA 524.2 |



|            |                            |        |        |      |           |
|------------|----------------------------|--------|--------|------|-----------|
| 74-97-5    | BROMOCHLOROMETHANE         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-25-2    | BROMOFORM                  | 0.0013 | 0.0005 | mg/L | EPA 524.2 |
| 74-83-9    | BROMOMETHANE               | ND     | 0.001  | mg/L | EPA 524.2 |
| 104-51-8   | BUTYLBENZENE,NORMAL-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 135-98-8   | BUTYLBENZENE,SEC-          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-06-6    | BUTYLBENZENE,TERT-         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 56-23-5    | CARBON TETRACHLORIDE       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 108-90-7   | CHLOROBENZENE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 124-48-1   | CHLORODIBROMOMETHANE       | 0.0077 | 0.0005 | mg/L | EPA 524.2 |
| 75-00-3    | CHLOROETHANE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 67-66-3    | CHLOROFORM                 | 0.0072 | 0.0005 | mg/L | EPA 524.2 |
| 74-87-3    | CHLOROMETHANE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-49-8    | CHLOROTOLUENE,2-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-43-4   | CHLOROTOLUENE,4-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 74-95-3    | DIBROMOMETHANE             | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-50-1    | DICHLOROBENZENE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 541-73-1   | DICHLOROBENZENE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-46-7   | DICHLOROBENZENE,1,4-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-27-4    | DICHLOROBROMOMETHANE       | 0.0099 | 0.0005 | mg/L | EPA 524.2 |
| 75-71-8    | DICHLORODIFLUOROMETHANE    | ND     | 0.001  | mg/L | EPA 524.2 |
| 75-34-3    | DICHLOROETHANE,1,1-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 107-06-2   | DICHLOROETHANE,1,2-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-35-4    | DICHLOROETHYLENE,1,1-      | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-59-2   | DICHLOROETHYLENE,1,2-CIS   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-60-5   | DICHLOROETHYLENE,1,2-TRANS | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-87-5    | DICHLOROPROPANE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 142-28-9   | DICHLOROPROPANE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 594-20-7   | DICHLOROPROPANE,2,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 563-58-6   | DICHLOROPROPENE,1,1-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-01-5 | DICHLOROPROPENE,1,3-CIS    | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-02-6 | DICHLOROPROPENE,1,3-TRANS  | ND     | 0.0005 | mg/L | EPA 524.2 |
| 100-41-4   | ETHYLBENZENE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-69-4    | FLUOROTRICHLOROMETHANE     | ND     | 0.001  | mg/L | EPA 524.2 |
| 87-68-3    | HEXACHLOROBUTADIENE        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-82-8    | ISOPROPYL BENZENE          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 99-87-6    | ISOPROPYL TOLUENE, PARA-   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-93-3    | METHYL ETHYL KETONE        | ND     | 0.005  | mg/L | EPA 524.2 |
| 108-10-1   | METHYL ISOBUTYL KETONE     | ND     | 0.005  | mg/L | EPA 524.2 |
| 1634-04-4  | METHYL TERT-BUTYL ETHER    | ND     | 0.001  | mg/L | EPA 524.2 |

|            |                            |       |        |      |               |
|------------|----------------------------|-------|--------|------|---------------|
| 75-09-2    | METHYLENE CHLORIDE         | ND    | 0.0006 | mg/L | EPA 524.2     |
| 91-20-3    | NAPHTHALENE                | ND    | 0.0005 | mg/L | EPA 524.2     |
| 103-65-1   | PROPYLBENZENE, NORMAL-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 100-42-5   | STYRENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 630-20-6   | TETRACHLOROETHANE,1,1,1,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-34-5    | TETRACHLOROETHANE,1,1,2,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 127-18-4   | TETRACHLOROETHYLENE        | ND    | 0.0005 | mg/L | EPA 524.2     |
| 109-99-9   | TETRAHYDROFURAN            | ND    | 0.005  | mg/L | EPA 524.2     |
| 108-88-3   | TOLUENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| TTHM-00-C  | TOTAL TRIHALOMETHANES      | 0.026 | NA     | mg/L | EPA 524.2     |
| 87-61-6    | TRICHLOROBENZENE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 120-82-1   | TRICHLOROBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 71-55-6    | TRICHLOROETHANE,1,1,1-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-00-5    | TRICHLOROETHANE,1,1,2-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-01-6    | TRICHLOROETHYLENE          | ND    | 0.0005 | mg/L | EPA 524.2     |
| 96-18-4    | TRICHLOROPROPANE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-63-6    | TRIMETHYLBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 108-67-8   | TRIMETHYLBENZENE,1,3,5-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 75-01-4    | VINYL CHLORIDE             | ND    | 0.0005 | mg/L | EPA 524.2     |
| XYLMP-00-C | XYLENE,META-&PARA-         | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-47-6    | XYLENE,ORTHO-              | ND    | 0.0005 | mg/L | EPA 524.2     |
| 1330-20-7  | XYLENES (TOTAL)            | ND    | NA     | mg/L | EPA 524.2     |
| 7439-97-6  | MERCURY                    | ND    | 0.0001 | mg/L | EPA 200.8     |
| 7440-02-0  | NICKEL                     | ND    | 0.01   | mg/L | EPA 200.8     |
| 14797-65-0 | NITRITE AS N (AUTOMATED)   | ND    | 0.05   | mg/L | 10-107-04-2-B |
| 14797-55-8 | NITRATE AS N (AUTOMATED)   | ND    | 0.4    | mg/L | 10-107-04-2-B |
| 7439-92-1  | LEAD (TOTAL)               | ND    | 0.001  | mg/L | EPA 200.8     |
| 7440-36-0  | ANTIMONY                   | ND    | 0.0006 | mg/L | EPA 200.8     |
| 7782-49-2  | SELENIUM (TOTAL)           | ND    | 0.001  | mg/L | EPA 200.8     |
| 14808-79-8 | SULFATE (AUTOMATED)        | 31    | 10     | mg/L | SM 4500 SO4E  |
| 7440-28-0  | THALLIUM                   | ND    | 0.0002 | mg/L | EPA 200.8     |

## Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1  
17:13:08 EDT 2015



## Michigan Department of Environmental Quality

### Replicate Laboratory Report for Lansing Drinking Water Laboratory

**Owner/Location Information:**

CITY OF FLINT  
4500 N DORT HWY  
FLINT MI 48505

Sample Number: LLF77582

**Sample/Collection Information:**

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 8/11/2015 10:00:00 AM

Arrival Date: 8/12/2015 1:21:17 PM

Site Code:

Water Source: Public Community Water Supply

Sample Reason: Routine Monitoring

Sample Point: Treated Public Distribution System

Point Description: PLANT TAP

Collector: Public Water Supply Operator

Collected By: C BEATENHEAD

| CasNo      | Analyte              | Result | Detect | Units | Method       |
|------------|----------------------|--------|--------|-------|--------------|
| 16984-48-8 | FLUORIDE (AUTOMATED) | 0.83   | 0.1    | mg/L  | SM 4500 FC   |
| 7439-89-6  | IRON                 | ND     | 0.1    | mg/L  | SM 3500 FeB  |
| HARD-00-C  | HARDNESS AS CaCO3    | 110    | 20     | mg/L  | SM 2340 C    |
| 7440-23-5  | SODIUM               | 18     | 5      | mg/L  | SM 3500 NaB  |
| 7440-38-2  | ARSENIC (TOTAL)      | ND     | 0.002  | mg/L  | EPA 200.8    |
| 7440-39-3  | BARIUM               | 0.02   | 0.01   | mg/L  | EPA 200.8    |
| 7440-41-7  | BERYLLIUM            | ND     | 0.0004 | mg/L  | EPA 200.8    |
| 57-12-5    | CYANIDE              | ND     | 0.02   | mg/L  | OIA-1677     |
| 7440-43-9  | CADMIUM (TOTAL)      | ND     | 0.0003 | mg/L  | EPA 200.8    |
| 7647-14-5  | CHLORIDE (AUTOMATED) | 79     | 4      | mg/L  | SM 4500-Cl E |
| 7440-47-3  | CHROMIUM (TOTAL)     | ND     | 0.01   | mg/L  | EPA 200.8    |

|            |                                       |    |         |      |           |
|------------|---------------------------------------|----|---------|------|-----------|
| 93-76-5    | 2,4,5-T                               | ND | 0.002   | mg/L | EPA 515.4 |
| 93-72-1    | 2,4,5-TP (SILVEX)                     | ND | 0.0002  | mg/L | EPA 515.4 |
| 94-75-7    | 2,4-D                                 | ND | 0.001   | mg/L | EPA 515.4 |
| 50594-66-6 | ACIFLUORFEN                           | ND | 0.004   | mg/L | EPA 515.4 |
| 25057-89-0 | BENTAZON                              | ND | 0.002   | mg/L | EPA 515.4 |
| 1918-00-9  | DICAMBA                               | ND | 0.002   | mg/L | EPA 515.4 |
| 88-85-7    | DINOSEB                               | ND | 0.0002  | mg/L | EPA 515.4 |
| 87-86-5    | PENTACHLOROPHENOL                     | ND | 0.00004 | mg/L | EPA 515.4 |
| 1918-02-1  | PICLORAM                              | ND | 0.001   | mg/L | EPA 515.4 |
| 1861-32-1  | TOTAL DCPA, MONO & DI-ACID DEGRADATES | ND | 0.001   | mg/L | EPA 515.4 |
| 116-06-3   | ALDICARB                              | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-88-4  | ALDICARB SULFONE                      | ND | 0.0005  | mg/L | EPA 531.2 |
| 1646-87-3  | ALDICARB SULFOXIDE                    | ND | 0.0005  | mg/L | EPA 531.2 |
| 63-25-2    | CARBARYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 1563-66-2  | CARBOFURAN                            | ND | 0.0005  | mg/L | EPA 531.2 |
| 16655-82-6 | HYDROXYCARBOFURAN,3-                  | ND | 0.001   | mg/L | EPA 531.2 |
| 2032-65-7  | METHIOCARB                            | ND | 0.001   | mg/L | EPA 531.2 |
| 16752-77-5 | METHOMYL                              | ND | 0.001   | mg/L | EPA 531.2 |
| 23135-22-0 | OXAMYL                                | ND | 0.001   | mg/L | EPA 531.2 |
| 114-26-1   | PROPOXUR (BAYGON)                     | ND | 0.001   | mg/L | EPA 531.2 |
| 34256-82-1 | ACETOCHLOR                            | ND | 0.001   | mg/L | EPA 525.2 |
| 15972-60-8 | ALACHLOR                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 309-00-2   | ALDRIN                                | ND | 0.0004  | mg/L | EPA 525.2 |
| 1912-24-9  | ATRAZINE                              | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-71-9  | CHLORDANE, ALPHA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 5103-74-2  | CHLORDANE, GAMMA-                     | ND | 0.0002  | mg/L | EPA 525.2 |
| 72-54-8    | DDD,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |
| 72-55-9    | DDE,4,4'-                             | ND | 0.001   | mg/L | EPA 525.2 |

|            |                                   |    |        |      |           |
|------------|-----------------------------------|----|--------|------|-----------|
| 50-29-3    | DDT,4,4'-                         | ND | 0.0005 | mg/L | EPA 525.2 |
| 60-57-1    | DIELDRIN                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 72-20-8    | ENDRIN                            | ND | 0.0001 | mg/L | EPA 525.2 |
| 7421-93-4  | ENDRIN ALDEHYDE                   | ND | 0.001  | mg/L | EPA 525.2 |
| 76-44-8    | HEPTACHLOR                        | ND | 0.0002 | mg/L | EPA 525.2 |
| 1024-57-3  | HEPTACHLOR EPOXIDE                | ND | 0.0001 | mg/L | EPA 525.2 |
| 118-74-1   | HEXACHLOROBENZENE                 | ND | 0.0001 | mg/L | EPA 525.2 |
| 319-84-6   | HEXACHLOROCYCLOHEXANE (ALPHA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 319-85-7   | HEXACHLOROCYCLOHEXANE (BETA-BHC)  | ND | 0.001  | mg/L | EPA 525.2 |
| 319-86-8   | HEXACHLOROCYCLOHEXANE (DELTA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 77-47-4    | HEXACHLOROCYCLOPENTADIENE         | ND | 0.0005 | mg/L | EPA 525.2 |
| 58-89-9    | LINDANE (GAMMA-BHC)               | ND | 0.0001 | mg/L | EPA 525.2 |
| 72-43-5    | METHOXYCHLOR                      | ND | 0.0001 | mg/L | EPA 525.2 |
| 51218-45-2 | METOLACHLOR                       | ND | 0.001  | mg/L | EPA 525.2 |
| 21087-64-9 | METRIBUZIN                        | ND | 0.001  | mg/L | EPA 525.2 |
| 2212-67-1  | MOLINATE                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 12674-11-2 | PCB (AROCLOR 1016)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11104-28-2 | PCB (AROCLOR 1221)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11141-16-5 | PCB (AROCLOR 1232)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 53469-21-9 | PCB (AROCLOR 1242)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 12672-29-6 | PCB (AROCLOR 1248)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11097-69-1 | PCB (AROCLOR 1254)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11096-82-5 | PCB (AROCLOR 1260)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 59536-65-1 | POLYBROMINATED BIPHENYLS          | ND | 0.0001 | mg/L | EPA 525.2 |
| 122-34-9   | SIMAZINE                          | ND | 0.0002 | mg/L | EPA 525.2 |
| 8001-35-2  | TOXAPHENE                         | ND | 0.001  | mg/L | EPA 525.2 |
| 71-43-2    | BENZENE                           | ND | 0.0005 | mg/L | EPA 524.2 |
| 108-86-1   | BROMOBENZENE                      | ND | 0.0005 | mg/L | EPA 524.2 |

|            |                            |        |        |      |           |
|------------|----------------------------|--------|--------|------|-----------|
| 74-97-5    | BROMOCHLOROMETHANE         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-25-2    | BROMOFORM                  | 0.0013 | 0.0005 | mg/L | EPA 524.2 |
| 74-83-9    | BROMOMETHANE               | ND     | 0.001  | mg/L | EPA 524.2 |
| 104-51-8   | BUTYLBENZENE,NORMAL-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 135-98-8   | BUTYLBENZENE,SEC-          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-06-6    | BUTYLBENZENE,TERT-         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 56-23-5    | CARBON TETRACHLORIDE       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 108-90-7   | CHLOROBENZENE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 124-48-1   | CHLORODIBROMOMETHANE       | 0.0052 | 0.0005 | mg/L | EPA 524.2 |
| 75-00-3    | CHLOROETHANE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 67-66-3    | CHLOROFORM                 | 0.0015 | 0.0005 | mg/L | EPA 524.2 |
| 74-87-3    | CHLOROMETHANE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-49-8    | CHLOROTOLUENE,2-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-43-4   | CHLOROTOLUENE,4-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 74-95-3    | DIBROMOMETHANE             | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-50-1    | DICHLOROBENZENE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 541-73-1   | DICHLOROBENZENE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-46-7   | DICHLOROBENZENE,1,4-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-27-4    | DICHLOROBROMOMETHANE       | 0.0036 | 0.0005 | mg/L | EPA 524.2 |
| 75-71-8    | DICHLORODIFLUOROMETHANE    | ND     | 0.001  | mg/L | EPA 524.2 |
| 75-34-3    | DICHLOROETHANE,1,1-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 107-06-2   | DICHLOROETHANE,1,2-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-35-4    | DICHLOROETHYLENE,1,1-      | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-59-2   | DICHLOROETHYLENE,1,2-CIS   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-60-5   | DICHLOROETHYLENE,1,2-TRANS | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-87-5    | DICHLOROPROPANE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 142-28-9   | DICHLOROPROPANE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 594-20-7   | DICHLOROPROPANE,2,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 563-58-6   | DICHLOROPROPENE,1,1-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-01-5 | DICHLOROPROPENE,1,3-CIS    | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-02-6 | DICHLOROPROPENE,1,3-TRANS  | ND     | 0.0005 | mg/L | EPA 524.2 |
| 100-41-4   | ETHYLBENZENE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-69-4    | FLUOROTRICHLOROMETHANE     | ND     | 0.001  | mg/L | EPA 524.2 |
| 87-68-3    | HEXACHLOROBUTADIENE        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-82-8    | ISOPROPYL BENZENE          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 99-87-6    | ISOPROPYL TOLUENE, PARA-   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-93-3    | METHYL ETHYL KETONE        | ND     | 0.005  | mg/L | EPA 524.2 |
| 108-10-1   | METHYL ISOBUTYL KETONE     | ND     | 0.005  | mg/L | EPA 524.2 |
| 1634-04-4  | METHYL TERT-BUTYL ETHER    | ND     | 0.001  | mg/L | EPA 524.2 |

|            |                            |       |        |      |               |
|------------|----------------------------|-------|--------|------|---------------|
| 75-09-2    | METHYLENE CHLORIDE         | ND    | 0.0006 | mg/L | EPA 524.2     |
| 91-20-3    | NAPHTHALENE                | ND    | 0.0005 | mg/L | EPA 524.2     |
| 103-65-1   | PROPYLBENZENE, NORMAL-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 100-42-5   | STYRENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 630-20-6   | TETRACHLOROETHANE,1,1,1,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-34-5    | TETRACHLOROETHANE,1,1,2,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 127-18-4   | TETRACHLOROETHYLENE        | ND    | 0.0005 | mg/L | EPA 524.2     |
| 109-99-9   | TETRAHYDROFURAN            | ND    | 0.005  | mg/L | EPA 524.2     |
| 108-88-3   | TOLUENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| TTHM-00-C  | TOTAL TRIHALOMETHANES      | 0.012 | NA     | mg/L | EPA 524.2     |
| 87-61-6    | TRICHLOROBENZENE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 120-82-1   | TRICHLOROBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 71-55-6    | TRICHLOROETHANE,1,1,1-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-00-5    | TRICHLOROETHANE,1,1,2-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-01-6    | TRICHLOROETHYLENE          | ND    | 0.0005 | mg/L | EPA 524.2     |
| 96-18-4    | TRICHLOROPROPANE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-63-6    | TRIMETHYLBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 108-67-8   | TRIMETHYLBENZENE,1,3,5-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 75-01-4    | VINYL CHLORIDE             | ND    | 0.0005 | mg/L | EPA 524.2     |
| XYLMP-00-C | XYLENE,META-&PARA-         | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-47-6    | XYLENE,ORTHO-              | ND    | 0.0005 | mg/L | EPA 524.2     |
| 1330-20-7  | XYLENES (TOTAL)            | ND    | NA     | mg/L | EPA 524.2     |
| 7439-97-6  | MERCURY                    | ND    | 0.0001 | mg/L | EPA 200.8     |
| 7440-02-0  | NICKEL                     | ND    | 0.01   | mg/L | EPA 200.8     |
| 14797-65-0 | NITRITE AS N (AUTOMATED)   | ND    | 0.05   | mg/L | 10-107-04-2-B |
| 14797-55-8 | NITRATE AS N (AUTOMATED)   | ND    | 0.4    | mg/L | 10-107-04-2-B |
| 7439-92-1  | LEAD (TOTAL)               | ND    | 0.001  | mg/L | EPA 200.8     |
| 7440-36-0  | ANTIMONY                   | ND    | 0.0006 | mg/L | EPA 200.8     |
| 7782-49-2  | SELENIUM (TOTAL)           | ND    | 0.001  | mg/L | EPA 200.8     |
| 14808-79-8 | SULFATE (AUTOMATED)        | 21    | 10     | mg/L | SM 4500 SO4E  |
| 7440-28-0  | THALLIUM                   | ND    | 0.0002 | mg/L | EPA 200.8     |



## Laboratory Comments:

Matrix spike recovery was below the acceptance criteria due to the presence of residual chlorine in the sample. This does not affect the validity of the sample result.

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1  
17:12:44 EDT 2015



## Michigan Department of Environmental Quality

### Replicate Laboratory Report for Lansing Drinking Water Laboratory

**Owner/Location Information:**

CITY OF FLINT  
4500 N DORT HWY  
FLINT MI 48505

Sample Number: LLF52712

**Sample/Collection Information:**

WSSN: 02310

County: Genesee

Township:

Section:

Well #:

Collection Date: 1/22/2015 10:00:00 AM

Arrival Date: 1/23/2015 8:37:00 AM

Site Code:

Water Source: Public Community Water Supply

Sample Reason: Other

Sample Point: Treated Public Distribution System

Point Description: PLANT TAP

Collector: Public Water Supply Operator

Collected By: MIKE GLASGOW

| CasNo     | Analyte          | Result | Detect | Units | Method    |
|-----------|------------------|--------|--------|-------|-----------|
| 7440-38-2 | ARSENIC (TOTAL)  | ND     | 0.002  | mg/L  | EPA 200.8 |
| 7440-39-3 | BARIUM           | 0.01   | 0.01   | mg/L  | EPA 200.8 |
| 7440-41-7 | BERYLLIUM        | ND     | 0.0004 | mg/L  | EPA 200.8 |
| 7440-43-9 | CADMIUM (TOTAL)  | ND     | 0.0003 | mg/L  | EPA 200.8 |
| 7440-47-3 | CHROMIUM (TOTAL) | ND     | 0.01   | mg/L  | EPA 200.8 |
| 7439-97-6 | MERCURY          | ND     | 0.0001 | mg/L  | EPA 200.8 |
| 7440-02-0 | NICKEL           | ND     | 0.01   | mg/L  | EPA 200.8 |
| 7439-92-1 | LEAD (TOTAL)     | ND     | 0.001  | mg/L  | EPA 200.8 |
| 7440-36-0 | ANTIMONY         | ND     | 0.0006 | mg/L  | EPA 200.8 |
| 7782-49-2 | SELENIUM (TOTAL) | 0.001  | 0.001  | mg/L  | EPA 200.8 |
| 7440-28-  |                  |        |        |       |           |

|   |          |    |        |      |           |
|---|----------|----|--------|------|-----------|
| 0 | THALLIUM | ND | 0.0002 | mg/L | EPA 200.8 |
|---|----------|----|--------|------|-----------|

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## Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1  
17:14:07 EDT 2015



## Michigan Department of Environmental Quality

### Replicate Laboratory Report for Lansing Drinking Water Laboratory

**Owner/Location Information:**

CITY OF FLINT  
CITY OF FLINT WATER  
PLANT  
FLINT MI 48505

Sample Number: LLF31222

**Sample/Collection Information:**

WSSN: 02310  
County: Genesee

Township:

Section:

Well #:

Collection Date: 8/6/2014 2:30:00 PM

Arrival Date: 8/6/2014 4:23:13 PM

Site Code:

Water Source: Other

Sample Reason: Other

Sample Point: Other

Point Description: PLANT TAP

Collector: Public Water Supply Operator

Collected By: MIKE GLASGOW

| CasNo      | Analyte              | Result | Detect | Units | Method       |
|------------|----------------------|--------|--------|-------|--------------|
| 16984-48-8 | FLUORIDE (AUTOMATED) | 0.70   | 0.1    | mg/L  | SM 4500 FC   |
| 7439-89-6  | IRON                 | ND     | 0.1    | mg/L  | SM 3500 FeB  |
| HARD-00-C  | HARDNESS AS CaCO3    | 155    | 20     | mg/L  | SM 2340 C    |
| 7440-23-5  | SODIUM               | 16     | 5      | mg/L  | SM 3500 NaB  |
| 7440-38-2  | ARSENIC (TOTAL)      | ND     | 0.002  | mg/L  | EPA 200.8    |
| 7440-39-3  | BARIUM               | 0.03   | 0.01   | mg/L  | EPA 200.8    |
| 7440-41-7  | BERYLLIUM            | ND     | 0.0004 | mg/L  | EPA 200.8    |
| 7440-43-9  | CADMIUM (TOTAL)      | ND     | 0.0003 | mg/L  | EPA 200.8    |
| 7647-14-5  | CHLORIDE (AUTOMATED) | 61     | 4      | mg/L  | SM 4500-Cl E |
| 7440-47-3  | CHROMIUM (TOTAL)     | ND     | 0.01   | mg/L  | EPA 200.8    |
| 93-76-5    | 2,4,5-T              | ND     | 0.002  | mg/L  | EPA 515.4    |

|            |                                       |        |         |      |           |
|------------|---------------------------------------|--------|---------|------|-----------|
| 93-72-1    | 2,4,5-TP (SILVEX)                     | ND     | 0.0003  | mg/L | EPA 515.4 |
| 94-75-7    | 2,4-D                                 | ND     | 0.002   | mg/L | EPA 515.4 |
| 50594-66-6 | ACIFLUORFEN                           | ND     | 0.004   | mg/L | EPA 515.4 |
| 25057-89-0 | BENTAZON                              | ND     | 0.002   | mg/L | EPA 515.4 |
| 1918-00-9  | DICAMBA                               | ND     | 0.002   | mg/L | EPA 515.4 |
| 88-85-7    | DINOSEB                               | ND     | 0.0003  | mg/L | EPA 515.4 |
| 87-86-5    | PENTACHLOROPHENOL                     | ND     | 0.00006 | mg/L | EPA 515.4 |
| 1918-02-1  | PICLORAM                              | ND     | 0.001   | mg/L | EPA 515.4 |
| 1861-32-1  | TOTAL DCPA, MONO & DI-ACID DEGRADATES | ND     | 0.001   | mg/L | EPA 515.4 |
| 116-06-3   | ALDICARB                              | ND     | 0.0005  | mg/L | EPA 531.2 |
| 1646-88-4  | ALDICARB SULFONE                      | ND     | 0.0005  | mg/L | EPA 531.2 |
| 1646-87-3  | ALDICARB SULFOXIDE                    | ND     | 0.0005  | mg/L | EPA 531.2 |
| 63-25-2    | CARBARYL                              | ND     | 0.001   | mg/L | EPA 531.2 |
| 1563-66-2  | CARBOFURAN                            | ND     | 0.0005  | mg/L | EPA 531.2 |
| 16655-82-6 | HYDROXYCARBOFURAN,3-                  | ND     | 0.001   | mg/L | EPA 531.2 |
| 2032-65-7  | METHIOCARB                            | ND     | 0.001   | mg/L | EPA 531.2 |
| 16752-77-5 | METHOMYL                              | ND     | 0.001   | mg/L | EPA 531.2 |
| 23135-22-0 | OXAMYL                                | ND     | 0.001   | mg/L | EPA 531.2 |
| 114-26-1   | PROPOXUR (BAYGON)                     | ND     | 0.001   | mg/L | EPA 531.2 |
| 34256-82-1 | ACETOCHLOR                            | ND     | 0.001   | mg/L | EPA 525.2 |
| 15972-60-8 | ALACHLOR                              | ND     | 0.0002  | mg/L | EPA 525.2 |
| 309-00-2   | ALDRIN                                | ND     | 0.0004  | mg/L | EPA 525.2 |
| 1912-24-9  | ATRAZINE                              | 0.0003 | 0.0002  | mg/L | EPA 525.2 |
| 5103-71-9  | CHLORDANE, ALPHA-                     | ND     | 0.0002  | mg/L | EPA 525.2 |
| 5103-74-2  | CHLORDANE, GAMMA-                     | ND     | 0.0002  | mg/L | EPA 525.2 |
| 72-54-8    | DDD,4,4'-                             | ND     | 0.001   | mg/L | EPA 525.2 |
| 72-55-9    | DDE,4,4'-                             | ND     | 0.001   | mg/L | EPA 525.2 |
| 50-29-3    | DDT,4,4'-                             | ND     | 0.0005  | mg/L | EPA 525.2 |

|            |                                   |    |        |      |           |
|------------|-----------------------------------|----|--------|------|-----------|
| 60-57-1    | DIELDRIN                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 72-20-8    | ENDRIN                            | ND | 0.0001 | mg/L | EPA 525.2 |
| 7421-93-4  | ENDRIN ALDEHYDE                   | ND | 0.001  | mg/L | EPA 525.2 |
| 76-44-8    | HEPTACHLOR                        | ND | 0.0002 | mg/L | EPA 525.2 |
| 1024-57-3  | HEPTACHLOR EPOXIDE                | ND | 0.0001 | mg/L | EPA 525.2 |
| 118-74-1   | HEXACHLOROBENZENE                 | ND | 0.0001 | mg/L | EPA 525.2 |
| 319-84-6   | HEXACHLOROCYCLOHEXANE (ALPHA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 319-85-7   | HEXACHLOROCYCLOHEXANE (BETA-BHC)  | ND | 0.001  | mg/L | EPA 525.2 |
| 319-86-8   | HEXACHLOROCYCLOHEXANE (DELTA-BHC) | ND | 0.001  | mg/L | EPA 525.2 |
| 77-47-4    | HEXACHLOROCYCLOPENTADIENE         | ND | 0.0005 | mg/L | EPA 525.2 |
| 58-89-9    | LINDANE (GAMMA-BHC)               | ND | 0.0001 | mg/L | EPA 525.2 |
| 72-43-5    | METHOXYCHLOR                      | ND | 0.0001 | mg/L | EPA 525.2 |
| 51218-45-2 | METOLACHLOR                       | ND | 0.001  | mg/L | EPA 525.2 |
| 21087-64-9 | METRIBUZIN                        | ND | 0.001  | mg/L | EPA 525.2 |
| 2212-67-1  | MOLINATE                          | ND | 0.0005 | mg/L | EPA 525.2 |
| 12674-11-2 | PCB (AROCLOR 1016)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11104-28-2 | PCB (AROCLOR 1221)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11141-16-5 | PCB (AROCLOR 1232)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 53469-21-9 | PCB (AROCLOR 1242)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 12672-29-6 | PCB (AROCLOR 1248)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11097-69-1 | PCB (AROCLOR 1254)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 11096-82-5 | PCB (AROCLOR 1260)                | ND | 0.0001 | mg/L | EPA 525.2 |
| 59536-65-1 | POLYBROMINATED BIPHENYLS          | ND | 0.0001 | mg/L | EPA 525.2 |
| 122-34-9   | SIMAZINE                          | ND | 0.0002 | mg/L | EPA 525.2 |
| 8001-35-2  | TOXAPHENE                         | ND | 0.001  | mg/L | EPA 525.2 |
| 71-43-2    | BENZENE                           | ND | 0.0005 | mg/L | EPA 524.2 |
| 108-86-1   | BROMOBENZENE                      | ND | 0.0005 | mg/L | EPA 524.2 |
| 74-97-5    | BROMOCHLOROMETHANE                | ND | 0.0005 | mg/L | EPA 524.2 |

|            |                            |        |        |      |           |
|------------|----------------------------|--------|--------|------|-----------|
| 75-25-2    | BROMOFORM                  | 0.0018 | 0.0005 | mg/L | EPA 524.2 |
| 74-83-9    | BROMOMETHANE               | ND     | 0.001  | mg/L | EPA 524.2 |
| 104-51-8   | BUTYLBENZENE,NORMAL-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 135-98-8   | BUTYLBENZENE,SEC-          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-06-6    | BUTYLBENZENE,TERT-         | ND     | 0.0005 | mg/L | EPA 524.2 |
| 56-23-5    | CARBON TETRACHLORIDE       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 108-90-7   | CHLOROBENZENE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 124-48-1   | CHLORODIBROMOMETHANE       | 0.015  | 0.0005 | mg/L | EPA 524.2 |
| 75-00-3    | CHLOROETHANE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 67-66-3    | CHLOROFORM                 | 0.045  | 0.0005 | mg/L | EPA 524.2 |
| 74-87-3    | CHLOROMETHANE              | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-49-8    | CHLOROTOLUENE,2-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-43-4   | CHLOROTOLUENE,4-           | ND     | 0.0005 | mg/L | EPA 524.2 |
| 74-95-3    | DIBROMOMETHANE             | ND     | 0.0005 | mg/L | EPA 524.2 |
| 95-50-1    | DICHLOROBENZENE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 541-73-1   | DICHLOROBENZENE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 106-46-7   | DICHLOROBENZENE,1,4-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-27-4    | DICHLOROBROMOMETHANE       | 0.024  | 0.0005 | mg/L | EPA 524.2 |
| 75-71-8    | DICHLORODIFLUOROMETHANE    | ND     | 0.001  | mg/L | EPA 524.2 |
| 75-34-3    | DICHLOROETHANE,1,1-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 107-06-2   | DICHLOROETHANE,1,2-        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-35-4    | DICHLOROETHYLENE,1,1-      | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-59-2   | DICHLOROETHYLENE,1,2-CIS   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 156-60-5   | DICHLOROETHYLENE,1,2-TRANS | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-87-5    | DICHLOROPROPANE,1,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 142-28-9   | DICHLOROPROPANE,1,3-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 594-20-7   | DICHLOROPROPANE,2,2-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 563-58-6   | DICHLOROPROPENE,1,1-       | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-01-5 | DICHLOROPROPENE,1,3-CIS    | ND     | 0.0005 | mg/L | EPA 524.2 |
| 10061-02-6 | DICHLOROPROPENE,1,3-TRANS  | ND     | 0.0005 | mg/L | EPA 524.2 |
| 100-41-4   | ETHYLBENZENE               | ND     | 0.0005 | mg/L | EPA 524.2 |
| 75-69-4    | FLUOROTRICHLOROMETHANE     | ND     | 0.001  | mg/L | EPA 524.2 |
| 87-68-3    | HEXACHLOROBUTADIENE        | ND     | 0.0005 | mg/L | EPA 524.2 |
| 98-82-8    | ISOPROPYL BENZENE          | ND     | 0.0005 | mg/L | EPA 524.2 |
| 99-87-6    | ISOPROPYL TOLUENE, PARA-   | ND     | 0.0005 | mg/L | EPA 524.2 |
| 78-93-3    | METHYL ETHYL KETONE        | ND     | 0.005  | mg/L | EPA 524.2 |
| 108-10-1   | METHYL ISOBUTYL KETONE     | ND     | 0.005  | mg/L | EPA 524.2 |
| 1634-04-4  | METHYL TERT-BUTYL ETHER    | ND     | 0.001  | mg/L | EPA 524.2 |
| 75-09-2    | METHYLENE CHLORIDE         | ND     | 0.0006 | mg/L | EPA 524.2 |

|            |                            |       |        |      |               |
|------------|----------------------------|-------|--------|------|---------------|
| 91-20-3    | NAPHTHALENE                | ND    | 0.0005 | mg/L | EPA 524.2     |
| 98-95-3    | NITROBENZENE               | ND    | 0.01   | mg/L | EPA 524.2     |
| 103-65-1   | PROPYLBENZENE, NORMAL-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 100-42-5   | STYRENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 630-20-6   | TETRACHLOROETHANE,1,1,1,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-34-5    | TETRACHLOROETHANE,1,1,2,2- | ND    | 0.0005 | mg/L | EPA 524.2     |
| 127-18-4   | TETRACHLOROETHYLENE        | ND    | 0.0005 | mg/L | EPA 524.2     |
| 109-99-9   | TETRAHYDROFURAN            | ND    | 0.005  | mg/L | EPA 524.2     |
| 108-88-3   | TOLUENE                    | ND    | 0.0005 | mg/L | EPA 524.2     |
| TTHM-00-C  | TOTAL TRIHALOMETHANES      | 0.086 | NA     | mg/L | EPA 524.2     |
| 87-61-6    | TRICHLOROBENZENE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 120-82-1   | TRICHLOROBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 71-55-6    | TRICHLOROETHANE,1,1,1-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-00-5    | TRICHLOROETHANE,1,1,2-     | ND    | 0.0005 | mg/L | EPA 524.2     |
| 79-01-6    | TRICHLOROETHYLENE          | ND    | 0.0005 | mg/L | EPA 524.2     |
| 96-18-4    | TRICHLOROPROPANE,1,2,3-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-63-6    | TRIMETHYLBENZENE,1,2,4-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 108-67-8   | TRIMETHYLBENZENE,1,3,5-    | ND    | 0.0005 | mg/L | EPA 524.2     |
| 75-01-4    | VINYL CHLORIDE             | ND    | 0.0004 | mg/L | EPA 524.2     |
| XYLMP-00-C | XYLENE,META-&PARA-         | ND    | 0.0005 | mg/L | EPA 524.2     |
| 95-47-6    | XYLENE,ORTHO-              | ND    | 0.0005 | mg/L | EPA 524.2     |
| 1330-20-7  | XYLENES (TOTAL)            | ND    | NA     | mg/L | EPA 524.2     |
| 7439-97-6  | MERCURY                    | ND    | 0.0001 | mg/L | EPA 200.8     |
| 7440-02-0  | NICKEL                     | ND    | 0.01   | mg/L | EPA 200.8     |
| 14797-65-0 | NITRITE AS N (AUTOMATED)   | ND    | 0.05   | mg/L | 10-107-04-2-B |
| 14797-55-8 | NITRATE AS N (AUTOMATED)   | 0.5   | 0.4    | mg/L | 10-107-04-2-B |
| 7439-92-1  | LEAD (TOTAL)               | ND    | 0.001  | mg/L | EPA 200.8     |
| 7440-36-0  | ANTIMONY                   | ND    | 0.0006 | mg/L | EPA 200.8     |
| 7782-49-2  | SELENIUM (TOTAL)           | 0.001 | 0.001  | mg/L | EPA 200.8     |
| 14808-79-8 | SULFATE (AUTOMATED)        | 23    | 10     | mg/L | SM 4500 SO4E  |
| 7440-28-0  | THALLIUM                   | ND    | 0.0002 | mg/L | EPA 200.8     |



## Laboratory Comments:

By authority of PA 368 of 1978 as amended.

Print Date: Thu Oct 1  
17:15:37 EDT 2015

**Rennaker, Joanne (DEQ)**

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**From:** Prysby, Mike (DEQ)  
**Sent:** Thursday, April 24, 2014 11:03 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** Flint WTP update

Steve,

Just a quick update on the Flint WTP operation. WTP operators started intermediate chlorination last night around 11pm and a residual of 1.6 ppm (free) is being measured at the bottom of each filter today. Filter effluent turbidities are between 0.03 and 0.04 NTUs and finished water hardness is around 160 ppm (raw water hardness is in the 210 to 220 range). The solids contact units are having bit more carry-over to the filters than desired, but maintaining blanket. WTP staff will investigate different polymers to improve softening performance. Filter bacteriological samples were collected earlier and the results will be available on time for tomorrow's switch-over.

\*\*\* Just received notice that the "switch-over ceremony" is now scheduled for 2pm, not 12-noon. The mayor is not available at 12 noon. I will plan to arrive at the WTP around 1:30 to 145ish.

Michael Prysby, P.E.  
District Engineer  
Office of Drinking Water and Municipal Assistance  
517 290-8817

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, April 21, 2014 10:29 AM  
**To:** Wurfel, Brad (DEQ)  
**Cc:** prysbym@michigan.gov; Shekter Smith, Liane (DEQ); Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** Flint

Brad,

Given that Flint is expected to complete work on the WTP and potentially change over from Detroit later this week, should we prepare a response statement from the DEQ in preparation for this event?

Obviously Flint is going to have a press release and invite media in as it's historic for them, but I know we are going to get questions.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, September 03, 2015 11:13 AM  
**To:** mglasgow@cityofflint.com  
**Subject:** Flint-TTHM-Compliance.pdf  
**Attachments:** Flint-TTHM-Compliance.pdf; ATT00001.txt

Attached



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING DISTRICT OFFICE



DAN WYANT  
DIRECTOR

September 2, 2015

Mr. Brent Wright, Operations Supervisor  
City Of Flint – Department of Public Works  
Flint Water Plant  
4500 North Dort Highway  
Flint, Michigan 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: City of Flint – Water Supply  
Return to Compliance Total Trihalomethanes (TTHM)  
3rd Quarter 2015 Monitoring Period

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the City of Flint (City) has returned to compliance with the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels for disinfection byproducts (MCLs)*, of the 1979 Administrative Code.

In accordance with Administrative Rule 610 (R 325.10610, *MCLs for disinfection byproducts*), the MCL for the disinfection byproduct TTHM is 0.080 milligrams per liter (mg/L). Compliance is determined based on a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the LRAA all eight of the City's TTHM compliance sampling sites now comply with this standard based on the last four quarterly monitoring periods, ending August 31, 2015. This return to compliance regarding TTHM's began on September 1, 2015, and will continue as long as the LRAA at each of the City's TTHM compliance sampling sites remain below this standard.

| TTHM Results (mg/L)                             | 11/20/14     | 2/17/15 | 5/18/15 | 8/18/15       | LRAA  | OEL   |
|-------------------------------------------------|--------------|---------|---------|---------------|-------|-------|
| DBP1 McDonalds<br>3719 Davison                  | 0.059        | 0.0162  | 0.0514  | 0.0755        | 0.050 | 0.055 |
| DBP2 Liquor Palace 3302<br>South Dort Highway   | 0.033        | 0.0168  | 0.0635  | 0.0532        | 0.042 | 0.047 |
| DBP3 North Flint Auto<br>6204 North Saginaw St. | 0.041        | 0.0149  | 0.0452  | 0.0426        | 0.036 | 0.036 |
| DBP4 University Market<br>2501 Flushing Road    | <b>0.094</b> | 0.0245  | 0.0598  | 0.0706        | 0.062 | 0.056 |
| DBP5 Taco Bell<br>3606 Corunna Road             | 0.034        | 0.0151  | 0.0547  | 0.0619        | 0.042 | 0.049 |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road        | 0.054        | 0.0192  | 0.0605  | 0.0595        | 0.048 | 0.050 |
| DBP7 Salem Housing<br>3216 MLK Boulevard        | 0.050        | 0.0285  | 0.0727  | <b>0.0903</b> | 0.060 | 0.070 |
| DBP8 BP Gas Station<br>822 South Dort Highway   | 0.036        | 0.0199  | 0.0461  | 0.0549        | 0.039 | 0.044 |

Mr. Brent Wright

2

September 2, 2015

Corrective measures by the City have been successful in achieving compliance with this standard. These measures have included replacement of anthracite filter media with granular activated carbon as well as the optimization of water treatment plant and distribution system processes and operations as recommended through Operational Evaluations conducted by the City. It is important that the City continue to follow these recommendations in order to limit disinfection byproduct formation and maintain compliance with the MCL LRAA standards. While the MCL LRAA standard has now been met at all eight compliance sampling sites, an individual TTHM concentration above 0.080 mg/L was measured at one location, DBP 7, during peak month sampling in August 2015.

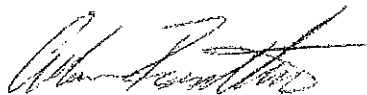
The DEQ encourages the City to continue informing customers about this updated water quality information and compliance with the TTHM MCL standard.

If you have any questions regarding this letter, please contact us at the numbers below; at prysbym@michigan.gov; or rosenthala@michigan.gov.

Sincerely,



Michael F. Prysby, P.E., District Engineer  
Lansing District Office  
Office of Drinking Water and  
Municipal Assistance  
517-290-8817



Adam Rosenthal, Environmental Quality  
Analyst  
Lansing District Office  
Office of Drinking Water and  
Municipal Assistance  
517-284-6644

cc: Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5  
Mr. Robert Bincsik, City of Flint  
Mr. Howard Croft, City of Flint  
Mr. Michael Glasgow, City of Flint  
Genesee County Health Department  
Mr. Stephen Busch, DEQ

**Rennaker, Joanne (DEQ)**

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**From:** Brent Wright <bwright@cityofflint.com>  
**Sent:** Friday, May 16, 2014 1:40 PM  
**To:** Prysby, Mike (DEQ); Busch, Stephen (DEQ)  
**Cc:** Howard Croft; Daugherty Johnson; Michael Glasgow  
**Subject:** Fluoride application at The Flint Water Treatment Plant

Gentleman per our earlier conversation Flint WTP would like to suspend the application of Fluoride in its treatment process until the first part of June, 2014. With this being our first month of operation and 2/3's of the operation staff in training, I feel the citizens of Flint would be better served if the operation staff were able to just concentrate on primary drinking water standards at this time. Please respond with any thoughts or concerns you may have regarding this matter.

Thank you

--

**Brent Wright**  
**Water Plant Supervisor**  
**City of Flint**  
**4500 N. Dort Hwy.**  
**Flint, MI. 48505**  
**Ph: 810.787.6537 ext. 3510**  
**Fx: 810.787.3710**

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, October 06, 2014 8:28 AM  
**To:** prysbym@michigan.gov  
**Subject:** FW:  
**Attachments:** 9-23-14 Wagner-Felkey.pdf

Mike,

Just an FYI. I haven't gotten any calls from this person despite her apparent attempts to contact us. I will let you know if she does call.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

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**From:** Poy, Thomas [<mailto:poy.thomas@epa.gov>]  
**Sent:** Friday, October 03, 2014 2:46 PM  
**To:** [joleen.wagner-felkey@va.gov](mailto:joleen.wagner-felkey@va.gov)  
**Cc:** Benzie, Richard (DEQ); Crooks, Jennifer; Busch, Stephen (DEQ)  
**Subject:**

Dear Ms. Wagner-Felkey:

I am responding to your inquiry about getting a contact for Flint drinking water quality. The Michigan Department of Environmental Quality implements the Drinking Water Program in the State of Michigan and works directly with Flint. You can contact Richard Benzie, Acting Chief of MDEQ's Field Operations Section at 517-284-6512 or Steve Busch, MDEQ District Supervisor at 517-643-23-14.

---

Tom Poy  
Chief, Ground Water and Drinking Water Branch  
USEPA - Region 5  
(312) 886-5991



**Department of Veterans Affairs**

VA Ann Arbor Healthcare System

2215 Fuller Rd

Ann Arbor, MI 48105



Date: 9/23/14

In reply: 11G

To: U.S. Environmental Protection Agency  
Office of Water (4101M)  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

From: JoLeen Wagner-Felkey, LCSW, ACSW  
Geri PACT Social Worker-GRECC- 11G

Subj: Water Quality Concern

I am a Geriatric Social Worker assisting with the case of an elderly Veteran and this letter is being composed to kindly request that an Environmental Protection Agency (EPA) staff member telephone the following number: 734-845-5194 or send an email to [joleen.wagner-felkey@va.gov](mailto:joleen.wagner-felkey@va.gov), to provide the appropriate contact information for personnel concerned with monitoring water quality/ safety in the Flint, Michigan area.

This letter is being forwarded subsequent to multiple, unsuccessful attempts to reach water management/ water quality contacts in Michigan to report concern(s) in hopes of being provided with the name and address for an EPA staff person, preferably in the Flint, MI area.

Thank you in advance for any assistance provided with this request.

Sincerely,

A handwritten signature in black ink, appearing to read "JoLeen Wagner-Felkey".

JoLeen Wagner-Felkey, LCSW, ACSW

FCL 20177631



U.S. Environmental Protection Agency  
 Office of Water (4101M)  
 1200 Pennsylvania Avenue N.W.  
 Washington D.C. 20460

NO POSTAGE  
 NECESSARY  
 IF MAILED  
 IN THE  
 UNITED STATES

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, October 16, 2014 9:19 AM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Another Flint complaint

FYI.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, October 16, 2014 9:18 AM  
**To:** 'Crooks, Jennifer'; Prysby, Mike (DEQ)  
**Subject:** RE: Another Flint complaint

Jennifer,

Here is some info on the chloride issue GM has indicated regarding water in Flint and Mike's discussion with the reporter below. As we discussed we do not follow the secondary MCL's in Michigan, but even if we did these levels are well below the secondary level for chloride.

[http://www.mlive.com/news/flint/index.ssf/2014/10/gms\\_decision\\_to\\_stop\\_using\\_fli.html](http://www.mlive.com/news/flint/index.ssf/2014/10/gms_decision_to_stop_using_fli.html)

[http://www.mlive.com/news/flint/index.ssf/2014/10/general\\_motors\\_wont\\_use\\_flint.html](http://www.mlive.com/news/flint/index.ssf/2014/10/general_motors_wont_use_flint.html)

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Prysby, Mike (DEQ)  
**Sent:** Monday, October 13, 2014 3:48 PM  
**To:** Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ); Wurfel, Brad (DEQ); Feuerstein, Heather (DEQ); Willard, Veronica (DEQ); Benzie, Richard (DEQ)  
**Subject:** Media Inquiry

Ron Fonger from the Flint Journal called me today concerning the GM Engine manufacturing plant in Flint and their intent to temporarily terminate water service from Flint and purchase water from Genesee County (via Flint Twp) until Flint is either treating water from KWA or reducing their chloride concentration from their treated water that meets GM's limit for manufacturing. Ron asked if elevated chlorides are a health concern in Flint. I looked up

Flint's MOR and noted that the treated water chloride concentration leaving the WTP ranges between 55 and 65 mg/l which, although not optimal (optimal being <20 mg/l), is satisfactory. Concentrations > 250 mg/l become objectionable due to taste & corrosion issues; however, based on the concentration leaving the WTP, we did not have any health-effect concerns. Ron was not able to recall the maximum chloride level acceptable to GM; however, I stressed the importance of not branding Flint's water as "corrosive" from a public health standpoint simply because it does not meet a manufacturing facility's limit for production. Ron also asked if the treatment process adds chloride. I explained that their primary coagulant is ferric chloride and this does add some chloride to the finished water; however, raw water chloride concentration is generally in the mid 40s mg/l; thus, the contribution from ferric chloride is not significant.

Michael Prysby, P.E.  
District Engineer  
Office of Drinking Water and Municipal Assistance  
517 290-8817

---

**From:** Crooks, Jennifer [<mailto:crooks.jennifer@epa.gov>]  
**Sent:** Thursday, October 16, 2014 8:45 AM  
**To:** Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Subject:** Another Flint complaint

This complaint came thru the SDWA Hotline. Interesting—this citizen reported that General Motors shut off their line to Flint water due to over-chlorination. See the link below.  
Jennifer

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**From:** Poy, Thomas  
**Sent:** Wednesday, October 15, 2014 12:07 PM  
**To:** Crooks, Jennifer  
**Subject:** FW: (SDWA - FY15-122649-3715-CV) Referred to Region - Michigan

Jen: Can you use the same reply for the control to reply to this similar complaint about Flint water?

Thanks.

Tom

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Tom Poy  
Chief, Ground Water and Drinking Water Branch  
USEPA - Region 5  
(312) 886-5991

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**From:** [howard.donna@epa.gov](mailto:howard.donna@epa.gov) [<mailto:howard.donna@epa.gov>]  
**Sent:** Wednesday, October 15, 2014 11:46 AM  
**To:** Poy, Thomas  
**Subject:** FWD: (SDWA - FY15-122649-3715-CV) Referred to Region - Michigan

10/15/2014

SUBJECT: FWD: (SDWA - FY15-122649-3715-CV) Referred to Region - Michigan  
FROM: [howard.donna@epa.gov](mailto:howard.donna@epa.gov)  
TO: [poy.thomas@epa.gov](mailto:poy.thomas@epa.gov)  
CC:

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

10/14/2014 9:07 AM

HQ LEAD NUMBER: FY15-122649-3715-CV

SUBJECT: Referred to Region - Michigan

FROM: [janburgess52@comcast.net](mailto:janburgess52@comcast.net)

TO:

Name: Jan Burgess

Address: 720 Commonwealth Ave

City: Flint

State: Michigan

Zip: 48503

Phone: 810-235-6530

Alleged Violator's Name: City of Flint

Alleged Violator's Address: 1101 S. Saginaw St.

Alleged Violator's City: Flint

Alleged Violator's State: Michigan

Alleged Violator's Zip: 48502

Tip or Complaint: Earlier this year, the City of Flint, MI changed its water supply from the City of Detroit [Lake Huron] to the Flint River. This river has a very long history of pollution. Since this change, our drinking water has tripled in cost and the quality varies daily. Some days it smells like an over-chlorinated swimming pool; other days, like pond scum. It often is brown in color and frequently has visible particles floating in it. We've been under several boil water advisories due to e-coli contamination. Just this morning our local paper reports that General Motors Engine plant has shut off Flint River water to the plant due to the over-chlorination and the fears that the water will cause corrosion.

[http://www.mlive.com/news/flint/index.ssf/2014/10/general\\_motors\\_wont\\_use\\_flint.html#cmpid=nsltr\\_stryheadline](http://www.mlive.com/news/flint/index.ssf/2014/10/general_motors_wont_use_flint.html#cmpid=nsltr_stryheadline).

People in Flint have had to resort to buying bottled water or having purification systems installed in their homes. Some residents have even had private wells dug. The water is not safe to drink, cook or wash dishes with, or even give to pets. We worry every time we shower. The City of Flint is still very economically depressed and most citizens cannot

afford to do anything other than use the river water. Many of them have NO water at all due to the extremely high water bills. There is reasonable suspicion that reports have been falsified. Some residents have had water tested privately and the results are not even close to those reported by the City. Calls to the City and State have resulted in no action whatsoever.

Violation Still Occurring? Yes

State DEP/DEQ/DEM Notified? No

**Rennaker, Joanne (DEQ)**

---

**From:** Rosenthal, Adam (DEQ)  
**Sent:** Thursday, May 15, 2014 9:18 AM  
**To:** Busch, Stephen (DEQ)  
**Cc:** Prysby, Mike (DEQ)  
**Subject:** FW: April '14 MOR  
**Attachments:** 4-14 State Report.xls

thought he CC'd you.

Adam

**From:** Michael Glasgow [<mailto:mglasgow@cityofflint.com>]  
**Sent:** Wednesday, May 14, 2014 2:33 PM  
**To:** Rosenthal, Adam (DEQ)  
**Subject:** Re: April '14 MOR

Adam,

Attached is a copy of our MOR. It is not complete. As you will see, it is only missing the information on plant flow. That data was in Brent's office, which was unfortunately flooded due to a replaced valve mishap. Flow coming out of the plant was shut off for a brief moment (valve was originally half open, and upon repair of the controller the valve was closed fully then re-opened) stopping flow to our pump station, and flooded the front offices with over 3 foot of water causing a lot of Brent's paper work to be saturated. He is still drying things out and separating them. I have forwarded your original message to him and I expect to have the completed version of our MOR to you by the end of the week. I am in the process of altering the MOR to reflect our new operation, however for last month considering the fact we only distributed water a couple days, I tried to combine them together. During those couple days we were also supplementing the distribution system with Detroit water located in our reservoirs.

Mike Glasgow  
 City of Flint Water Plant

On Wed, May 14, 2014 at 8:52 AM, Rosenthal, Adam (DEQ) <[ROSENTHALA@michigan.gov](mailto:ROSENTHALA@michigan.gov)> wrote:

Morning Mike, reporters are calling and Steve is looking for the April '14 MOR, please email a copy when you get this.

Please note that since Flint submits the monthly bacti results with the MOR, it is due by the 10<sup>th</sup> of the month. Please make sure to send future MORs, or at least the bacti results so they are received by the 10<sup>th</sup>.

thanks,

Adam Rosenthal, EQA

MDEQ – Office of Drinking Water and Municipal Assistance

Lansing District – Constitution Hall 1SW

PO Box 30242

Lansing, MI 48909

517-284-6644

fax: 517-241-3571



**Apr-14**

[illegible]



## Flouridation &amp; Chlorination

WSSN 2310

Apr-14

| D<br>A<br>T<br>E | Fluorid<br>e<br>Applied<br>F- mg/l | Fluoride Analyses mg/l |      |      | Chlorine App. Mg/l |                                                       |                           | Chlorine Residual mg/l |        |      |             |    |     |     |    |
|------------------|------------------------------------|------------------------|------|------|--------------------|-------------------------------------------------------|---------------------------|------------------------|--------|------|-------------|----|-----|-----|----|
|                  |                                    |                        |      |      |                    | Chlorine<br>(prior to<br>filtration<br>) mg/L<br>OCl- | Post<br>Chlorin<br>e mg/L | B&P                    | Sta II | Dort | 3MG<br>Well |    | Tap |     |    |
|                  |                                    | Free                   | Free | Free |                    |                                                       |                           | Free                   |        |      | Free        |    |     |     |    |
|                  |                                    | Raw                    | Tap  | Dist |                    |                                                       |                           | 18                     | 19     | 20   | 21          | 22 | 23  | 24  | 25 |
| 1                |                                    |                        | 0.59 |      |                    |                                                       |                           | 0.8                    | 0.9    | 0.9  | 0.9         |    |     | 0.9 |    |
| 2                |                                    |                        | 0.58 |      |                    |                                                       |                           | 1.0                    | 1.0    | 0.9  | 0.9         |    |     | 0.9 |    |
| 3                |                                    |                        | 0.63 |      |                    |                                                       |                           | 0.8                    | 1.1    | 1.0  | 0.9         |    |     | 0.9 |    |
| 4                |                                    |                        | 0.65 |      |                    |                                                       |                           | 1.0                    | 1.1    | 0.9  | 1.0         |    |     | 1.0 |    |
| 5                |                                    |                        | 0.66 |      |                    |                                                       |                           | 1.0                    | 1.1    | 1.1  | 1.0         |    |     | 1.1 |    |
| 6                |                                    |                        | 0.65 |      |                    |                                                       |                           | 1.0                    | 1.0    | 1.0  | 1.0         |    |     | 0.9 |    |
| 7                |                                    |                        | 0.71 |      |                    |                                                       |                           | n.s                    | n.s    | n.s  | n.s         |    |     | 1.0 |    |
| 8                |                                    |                        | 0.68 |      |                    |                                                       |                           | 0.8                    | 1.0    | 0.9  | 0.9         |    |     | 0.9 |    |
| 9                |                                    |                        | 0.64 |      |                    |                                                       |                           | 1.0                    | 1.0    | 0.9  | 0.9         |    |     | 0.8 |    |
| 10               |                                    |                        | 0.68 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | 0.9         |    |     | 0.8 |    |
| 11               |                                    |                        | 0.64 |      |                    |                                                       |                           | 1.0                    | 1.2    | 1.0  | 1.0         |    |     | 1.0 |    |
| 12               |                                    |                        | 0.63 |      |                    |                                                       |                           | 0.8                    | 0.9    | 0.8  | 0.8         |    |     | 1.0 |    |
| 13               |                                    |                        | 0.67 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | 0.8         |    |     | 0.9 |    |
| 14               |                                    |                        | 0.62 |      |                    |                                                       |                           | 0.9                    | 1.0    | 1.0  | 0.9         |    |     | 1.0 |    |
| 15               |                                    |                        | 0.54 |      |                    |                                                       |                           | 0.9                    | 1.1    | 1.0  | n/a         |    |     | 1.0 |    |
| 16               |                                    |                        | 0.54 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | n/a         |    |     | 0.8 |    |
| 17               |                                    |                        | 0.59 |      |                    |                                                       |                           | 0.8                    | 1.1    | 0.9  | n/a         |    |     | 0.9 |    |
| 18               |                                    |                        | 0.54 |      |                    |                                                       |                           | 0.9                    | 1.0    | 1.0  | n/a         |    |     | 1.0 |    |
| 19               |                                    |                        | 0.57 |      |                    |                                                       |                           | 0.8                    | 1.0    | 0.9  | n/a         |    |     | 1.0 |    |
| 20               |                                    |                        | n/a  |      |                    |                                                       |                           | n.s                    | n.s    | n.s  | n/a         |    |     | n.s |    |
| 21               |                                    |                        | 0.61 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | n/a         |    |     | 1.0 |    |
| 22               |                                    |                        | 0.66 |      |                    |                                                       |                           | 0.8                    | 1.1    | 0.9  | n/a         |    |     | 1.0 |    |
| 23               |                                    |                        | 0.61 |      |                    |                                                       |                           | 0.8                    | 1.0    | 0.9  | n/a         |    |     | 0.8 |    |
| 24               |                                    |                        | 0.61 |      |                    |                                                       |                           | n.s                    | 1.0    | 0.9  | n/a         |    |     | 0.9 |    |
| 25               |                                    | 0.14                   | 0.59 |      |                    | 3.5                                                   |                           | n.s                    | n/a    | n.s  | 1.7         |    |     | 0.8 |    |
| 26               |                                    | 0.14                   | 0.53 |      |                    | 3.5                                                   |                           | n.s                    | n/a    | n.s  | 1.6         |    |     | 0.9 |    |
| 27               |                                    | 0.13                   | 0.53 |      |                    | 3.6                                                   |                           | n.s                    | n/a    | n.s  | 1.5         |    |     | 1.0 |    |
| 28               |                                    | 0.13                   | 0.19 |      |                    | 3.7                                                   |                           | n.s                    | n/a    | n.s  | 1.4         |    |     | 0.9 |    |
| 29               |                                    | 0.15                   | 0.58 |      |                    | 3.7                                                   |                           | n.s                    | n/a    | n.s  | 1.5         |    |     | 0.9 |    |
| 30               |                                    | 0.15                   | 0.62 |      |                    | 3.5                                                   |                           | n.s                    | n/a    | n.s  | 1.7         |    |     | 0.8 |    |
| AVG              |                                    | 0.14                   | 0.60 |      |                    | 3.6                                                   |                           | 0.9                    | 1.0    | 0.9  | 1.1         |    |     | 0.9 |    |
| MAX              |                                    | 0.15                   | 0.71 |      |                    | 3.7                                                   |                           | 1.0                    | 1.2    | 1.1  | 1.7         |    |     | 1.1 |    |
| MIN              |                                    | 0.13                   | 0.19 |      |                    | 3.5                                                   |                           | 0.8                    | 0.9    | 0.8  | 0.8         |    |     | 0.8 |    |

n.s. = no sample collected/tested



## Chemical Analyses

WSSN 2310

Apr-14

| D<br>A<br>T<br>E | pH   |      | Total Hard<br>as CaCO <sub>3</sub><br>mg/l |     | Total Alk as<br>CaCO <sub>3</sub> mg/l |     | NonCarbonate<br>Hardness as<br>CaCO <sub>3</sub> mg/l |     |     |     | Calcium Ca<br>++ mg/l |      | Magnesium<br>as Mg ++<br>mg/l |     | Chloride as<br>Cl - mg/l |     |
|------------------|------|------|--------------------------------------------|-----|----------------------------------------|-----|-------------------------------------------------------|-----|-----|-----|-----------------------|------|-------------------------------|-----|--------------------------|-----|
|                  | Raw  | Tap  | Raw                                        | Tap | Raw                                    | Tap | Raw                                                   | Tap | Raw | Tap | Raw                   | Tap  | Raw                           | Tap | Raw                      | Tap |
|                  | 29   | 30   | 31                                         | 32  | 33                                     | 34  | 35                                                    | 36  | 37  | 38  | 39                    | 40   | 41                            | 42  | 43                       | 44  |
| 1                |      | 7.57 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 30.5 |                               | 5.3 |                          |     |
| 2                |      | 7.36 |                                            | 98  |                                        | 73  |                                                       | 25  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 3                |      | 7.33 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 30.5 |                               | 5.3 |                          |     |
| 4                |      | 7.32 |                                            | 100 |                                        | 75  |                                                       | 25  |     |     |                       | 32.1 |                               | 4.9 |                          |     |
| 5                |      | 7.44 |                                            | 100 |                                        | 76  |                                                       | 24  |     |     |                       | 30.5 |                               | 5.8 |                          |     |
| 6                |      | 7.32 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 7                |      | 7.41 |                                            | 100 |                                        | 73  |                                                       | 27  |     |     |                       | 31.3 |                               | 5.3 |                          |     |
| 8                |      | 7.62 |                                            | 98  |                                        | 69  |                                                       | 29  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 9                |      | 7.46 |                                            | 98  |                                        | 72  |                                                       | 26  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 10               |      | 7.39 |                                            | 98  |                                        | 71  |                                                       | 27  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 11               |      | 7.34 |                                            | 100 |                                        | 75  |                                                       | 25  |     |     |                       | 31.3 |                               | 5.3 |                          |     |
| 12               |      | 7.56 |                                            | 102 |                                        | 71  |                                                       | 31  |     |     |                       | 28.1 |                               | 7.8 |                          |     |
| 13               |      | 7.37 |                                            | 96  |                                        | 64  |                                                       | 32  |     |     |                       | 28.9 |                               | 5.8 |                          |     |
| 14               |      | 7.32 |                                            | 96  |                                        | 75  |                                                       | 21  |     |     |                       | 28.9 |                               | 5.8 |                          |     |
| 15               |      | 7.46 |                                            | 98  |                                        | 73  |                                                       | 25  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 16               |      | 7.47 |                                            | 96  |                                        | 66  |                                                       | 30  |     |     |                       | 28.9 |                               | 5.8 |                          |     |
| 17               |      | 7.32 |                                            | 96  |                                        | 71  |                                                       | 25  |     |     |                       | 29.7 |                               | 5.3 |                          |     |
| 18               |      | 7.30 |                                            | 98  |                                        | 73  |                                                       | 25  |     |     |                       | 31.3 |                               | 4.9 |                          |     |
| 19               |      | 7.28 |                                            | 100 |                                        | 72  |                                                       | 28  |     |     |                       | 28.9 |                               | 6.8 |                          |     |
| 20               |      | n.s  |                                            | n.s |                                        | n.s |                                                       | n.s |     |     |                       | n.s  |                               | n.s |                          |     |
| 21               |      | 7.34 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 22               |      | 7.26 |                                            | 98  |                                        | 72  |                                                       | 26  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 23               |      | 7.25 |                                            | 98  |                                        | 71  |                                                       | 27  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 24               |      | 7.46 |                                            | 96  |                                        | 71  |                                                       | 25  |     |     |                       | 29.7 |                               | 5.3 |                          |     |
| 25               |      | 7.39 |                                            | 96  |                                        | 75  | 0                                                     | 21  |     |     |                       | 29.7 |                               | 5.3 |                          |     |
| 26               | 8.31 | 7.28 | 255                                        | 98  | 200                                    | 73  | 55                                                    | 25  |     |     | 77.9                  | 29.7 | 13.6                          | 5.8 | 48                       | 24  |
| 27               | 8.34 | 7.32 | 249                                        | 98  | 199                                    | 70  | 50                                                    | 28  |     |     | 75.4                  | 30.5 | 14.6                          | 5.8 | 42                       | 32  |
| 28               | 8.39 | 8.46 | 247                                        | 92  | 205                                    | 60  | 42                                                    | 32  |     |     | 82.6                  | 46.5 | 9.8                           | 8.3 | 43                       | 68  |
| 29               | 8.46 | 7.35 | 230                                        | 98  | 190                                    | 70  | 40                                                    | 28  |     |     | 76.2                  | 30.5 | 9.7                           | 5.3 |                          |     |
| 30               | 8.41 | 7.30 | 248                                        | 98  | 208                                    | 73  | 40                                                    | 25  |     |     | 72.1                  | 29.7 | 17.5                          | 5.8 | 45                       | 17  |
| AVG              |      | 7.42 |                                            | 98  |                                        | 72  |                                                       | 26  |     |     |                       | 30.4 |                               | 5.9 |                          |     |
| MAX              |      | 8.46 |                                            | 102 |                                        | 76  |                                                       | 32  |     |     |                       | 46.5 |                               | 8.3 |                          |     |
| MIN              |      | 7.25 |                                            | 92  |                                        | 60  |                                                       | 21  |     |     |                       | 28.1 |                               | 4.9 |                          |     |

n.s. = no sample collected/tested



## Bacteriological &amp; Physical Parameters

WSSN 2310

Apr-14

| DATE                              | Total Coliform |        |      |          |         |         |    | Standard Plate Count |     | Wind Direction | Temp deg.C | Color |     | Odor |     |
|-----------------------------------|----------------|--------|------|----------|---------|---------|----|----------------------|-----|----------------|------------|-------|-----|------|-----|
|                                   | Plant Tap      |        |      |          |         |         |    | Raw                  | Tap |                |            | Raw   | Tap | Raw  | Tap |
|                                   | B&P            | C.F.E. | Dort | 3MG Well | C.S. #2 | Lab Tap |    |                      |     |                |            |       |     |      |     |
|                                   |                |        |      |          |         |         |    |                      |     |                |            |       |     |      |     |
| 60                                | 61             | 62     | 63   | 64       | 65      | 66      | 67 | 68                   | 69  | 70             | 71         | 72    | 73  | 74   |     |
| 1                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.1       |       |     |      |     |
| 2                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.1       |       |     |      |     |
| 3                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 11.7       |       |     |      |     |
| 4                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 11.7       |       |     |      |     |
| 5                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.9       |       |     |      |     |
| 6                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.7       |       |     |      |     |
| 7                                 | 0/0            |        | 0/0  | 0/0      | 0/0     | 2/0     |    |                      |     |                | 11.3       |       |     |      |     |
| 8                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.9        |       |     |      |     |
| 9                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.2       |       |     |      |     |
| 10                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      | < 2 |                | 8.8        |       |     |      |     |
| 11                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.1        |       |     |      |     |
| 12                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.1       |       |     |      |     |
| 13                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.8        |       |     |      |     |
| 14                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.9        |       |     |      |     |
| 15                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 8.9        |       |     |      |     |
| 16                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.6       |       |     |      |     |
| 17                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 9.4        |       |     |      |     |
| 18                                | 1/0            |        | 1/0  | 0/0      | 1/0     | 2/0     |    |                      |     |                | 9.2        |       |     |      |     |
| 19                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 8.3        |       |     |      |     |
| 20                                | 0/0            |        | 0/0  | 0/0      | 0/0     | 0/0     |    |                      |     |                | n.s        |       |     |      |     |
| 21                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 8.1        |       |     |      |     |
| 22                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 7.7        |       |     |      |     |
| 23                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 9.3        |       |     |      |     |
| 24                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 8.7        |       |     |      |     |
| 25                                | 1/0            | 10/0   | 0/0  | 1/0      | n/a     | 1/0     |    |                      | < 2 |                | 8.7        |       |     |      |     |
| 26                                | 1/0            | 12/0   | 0/0  | 1/0      | n/a     | 1/0     |    | > 1476               | < 2 |                | 9.0        |       |     |      |     |
| 27                                | 1/0            | 12/0   | 0/0  | 1/0      | n/a     | 1/0     |    | 142                  | < 2 |                | 8.8        |       |     |      |     |
| 28                                | 1/0            | 12/0   | 0/0  | 1/0      | n/a     | 1/0     |    | 532                  | < 2 |                | 7.9        |       |     |      |     |
| 29                                | 1/0            | 4/0    | 0/0  | 1/0      | n/a     | 1/0     |    |                      | < 2 |                | 8.5        |       |     |      |     |
| 30                                | 1/0            | 6/0    | 0/0  | 1/0      | n/a     | 1/0     |    | 1246                 | < 2 |                | 10.3       |       |     |      |     |
| C.F.E. = Combined Filter Effluent |                |        |      |          |         |         |    |                      |     |                | 9.6        |       |     |      |     |
|                                   |                |        |      |          |         |         |    |                      |     |                | 11.7       |       |     |      |     |
|                                   |                |        |      |          |         |         |    |                      |     |                | 7.7        |       |     |      |     |

n.s. = no sample collected/tested

Apr-14

[illegible]



## Distribution System Monitoring

WSSN 2310

Apr-14

[illegible]



# ROUTINE POSITIVE DISTRIBUTION SAMPLES

Apr-14

| Total number of positive routine samples:              |                    |                |                | Total Coliform: <u>0</u> |                                          | Fecal Coliform: <u>0</u> |                |
|--------------------------------------------------------|--------------------|----------------|----------------|--------------------------|------------------------------------------|--------------------------|----------------|
| Date                                                   | Monitoring Station | Total Coliform | Fecal Coliform | Date                     | Retest of Station, Upstream & Downstream | Total Coliform           | Fecal Coliform |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
| Total number of routine distribution samples analyzed: |                    |                |                | 114                      |                                          |                          |                |
| Total number of routine distribution samples required: |                    |                |                | 100                      |                                          |                          |                |

Apr-14

[illegible]





## Flouridation &amp; Chlorination

WSSN 2310

Apr-14

| D<br>A<br>T<br>E | Fluorid<br>e<br>Applied<br>F- mg/l | Fluoride Analyses mg/l |      |      | Chlorine App. Mg/l |                                                       |                           | Chlorine Residual mg/l |        |      |             |    |     |     |    |
|------------------|------------------------------------|------------------------|------|------|--------------------|-------------------------------------------------------|---------------------------|------------------------|--------|------|-------------|----|-----|-----|----|
|                  |                                    |                        |      |      |                    | Chlorine<br>(prior to<br>filtration<br>) mg/L<br>OCl- | Post<br>Chlorin<br>e mg/L | B&P                    | Sta II | Dort | 3MG<br>Well |    | Tap |     |    |
|                  |                                    | Free                   | Free | Free |                    |                                                       |                           | Free                   |        |      | Free        |    |     |     |    |
|                  | 14                                 | 15                     | 16   | 17   | 18                 | 19                                                    | 20                        | 21                     | 22     | 23   | 24          | 25 | 26  | 27  | 28 |
| 1                |                                    |                        | 0.59 |      |                    |                                                       |                           | 0.8                    | 0.9    | 0.9  | 0.9         |    |     | 0.9 |    |
| 2                |                                    |                        | 0.58 |      |                    |                                                       |                           | 1.0                    | 1.0    | 0.9  | 0.9         |    |     | 0.9 |    |
| 3                |                                    |                        | 0.63 |      |                    |                                                       |                           | 0.8                    | 1.1    | 1.0  | 0.9         |    |     | 0.9 |    |
| 4                |                                    |                        | 0.65 |      |                    |                                                       |                           | 1.0                    | 1.1    | 0.9  | 1.0         |    |     | 1.0 |    |
| 5                |                                    |                        | 0.66 |      |                    |                                                       |                           | 1.0                    | 1.1    | 1.1  | 1.0         |    |     | 1.1 |    |
| 6                |                                    |                        | 0.65 |      |                    |                                                       |                           | 1.0                    | 1.0    | 1.0  | 1.0         |    |     | 0.9 |    |
| 7                |                                    |                        | 0.71 |      |                    |                                                       |                           | n.s                    | n.s    | n.s  | n.s         |    |     | 1.0 |    |
| 8                |                                    |                        | 0.68 |      |                    |                                                       |                           | 0.8                    | 1.0    | 0.9  | 0.9         |    |     | 0.9 |    |
| 9                |                                    |                        | 0.64 |      |                    |                                                       |                           | 1.0                    | 1.0    | 0.9  | 0.9         |    |     | 0.8 |    |
| 10               |                                    |                        | 0.68 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | 0.9         |    |     | 0.8 |    |
| 11               |                                    |                        | 0.64 |      |                    |                                                       |                           | 1.0                    | 1.2    | 1.0  | 1.0         |    |     | 1.0 |    |
| 12               |                                    |                        | 0.63 |      |                    |                                                       |                           | 0.8                    | 0.9    | 0.8  | 0.8         |    |     | 1.0 |    |
| 13               |                                    |                        | 0.67 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | 0.8         |    |     | 0.9 |    |
| 14               |                                    |                        | 0.62 |      |                    |                                                       |                           | 0.9                    | 1.0    | 1.0  | 0.9         |    |     | 1.0 |    |
| 15               |                                    |                        | 0.54 |      |                    |                                                       |                           | 0.9                    | 1.1    | 1.0  | n/a         |    |     | 1.0 |    |
| 16               |                                    |                        | 0.54 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | n/a         |    |     | 0.8 |    |
| 17               |                                    |                        | 0.59 |      |                    |                                                       |                           | 0.8                    | 1.1    | 0.9  | n/a         |    |     | 0.9 |    |
| 18               |                                    |                        | 0.54 |      |                    |                                                       |                           | 0.9                    | 1.0    | 1.0  | n/a         |    |     | 1.0 |    |
| 19               |                                    |                        | 0.57 |      |                    |                                                       |                           | 0.8                    | 1.0    | 0.9  | n/a         |    |     | 1.0 |    |
| 20               |                                    |                        | n/a  |      |                    |                                                       |                           | n.s                    | n.s    | n.s  | n/a         |    |     | n.s |    |
| 21               |                                    |                        | 0.61 |      |                    |                                                       |                           | 0.9                    | 1.0    | 0.9  | n/a         |    |     | 1.0 |    |
| 22               |                                    |                        | 0.66 |      |                    |                                                       |                           | 0.8                    | 1.1    | 0.9  | n/a         |    |     | 1.0 |    |
| 23               |                                    |                        | 0.61 |      |                    |                                                       |                           | 0.8                    | 1.0    | 0.9  | n/a         |    |     | 0.8 |    |
| 24               |                                    |                        | 0.61 |      |                    |                                                       |                           | n.s                    | 1.0    | 0.9  | n/a         |    |     | 0.9 |    |
| 25               |                                    | 0.14                   | 0.59 |      |                    | 3.5                                                   |                           | n.s                    | n/a    | n.s  | 1.7         |    |     | 0.8 |    |
| 26               |                                    | 0.14                   | 0.53 |      |                    | 3.5                                                   |                           | n.s                    | n/a    | n.s  | 1.6         |    |     | 0.9 |    |
| 27               |                                    | 0.13                   | 0.53 |      |                    | 3.6                                                   |                           | n.s                    | n/a    | n.s  | 1.5         |    |     | 1.0 |    |
| 28               |                                    | 0.13                   | 0.19 |      |                    | 3.7                                                   |                           | n.s                    | n/a    | n.s  | 1.4         |    |     | 0.9 |    |
| 29               |                                    | 0.15                   | 0.58 |      |                    | 3.7                                                   |                           | n.s                    | n/a    | n.s  | 1.5         |    |     | 0.9 |    |
| 30               |                                    | 0.15                   | 0.62 |      |                    | 3.5                                                   |                           | n.s                    | n/a    | n.s  | 1.7         |    |     | 0.8 |    |
| AVG              |                                    | 0.14                   | 0.60 |      |                    | 3.6                                                   |                           | 0.9                    | 1.0    | 0.9  | 1.1         |    |     | 0.9 |    |
| MAX              |                                    | 0.15                   | 0.71 |      |                    | 3.7                                                   |                           | 1.0                    | 1.2    | 1.1  | 1.7         |    |     | 1.1 |    |
| MIN              |                                    | 0.13                   | 0.19 |      |                    | 3.5                                                   |                           | 0.8                    | 0.9    | 0.8  | 0.8         |    |     | 0.8 |    |

n.s. = no sample collected/tested



## Chemical Analyses

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| D<br>A<br>T<br>E | pH   |      | Total Hard<br>as CaCO <sub>3</sub><br>mg/l |     | Total Alk as<br>CaCO <sub>3</sub> mg/l |     | NonCarbonate<br>Hardness as<br>CaCO <sub>3</sub> mg/l |     |     |     | Calcium Ca<br>++ mg/l |      | Magnesium<br>as Mg ++<br>mg/l |     | Chloride as<br>Cl - mg/l |     |
|------------------|------|------|--------------------------------------------|-----|----------------------------------------|-----|-------------------------------------------------------|-----|-----|-----|-----------------------|------|-------------------------------|-----|--------------------------|-----|
|                  | Raw  | Tap  | Raw                                        | Tap | Raw                                    | Tap | Raw                                                   | Tap | Raw | Tap | Raw                   | Tap  | Raw                           | Tap | Raw                      | Tap |
|                  | 29   | 30   | 31                                         | 32  | 33                                     | 34  | 35                                                    | 36  | 37  | 38  | 39                    | 40   | 41                            | 42  | 43                       | 44  |
| 1                |      | 7.57 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 30.5 |                               | 5.3 |                          |     |
| 2                |      | 7.36 |                                            | 98  |                                        | 73  |                                                       | 25  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 3                |      | 7.33 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 30.5 |                               | 5.3 |                          |     |
| 4                |      | 7.32 |                                            | 100 |                                        | 75  |                                                       | 25  |     |     |                       | 32.1 |                               | 4.9 |                          |     |
| 5                |      | 7.44 |                                            | 100 |                                        | 76  |                                                       | 24  |     |     |                       | 30.5 |                               | 5.8 |                          |     |
| 6                |      | 7.32 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 7                |      | 7.41 |                                            | 100 |                                        | 73  |                                                       | 27  |     |     |                       | 31.3 |                               | 5.3 |                          |     |
| 8                |      | 7.62 |                                            | 98  |                                        | 69  |                                                       | 29  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 9                |      | 7.46 |                                            | 98  |                                        | 72  |                                                       | 26  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 10               |      | 7.39 |                                            | 98  |                                        | 71  |                                                       | 27  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 11               |      | 7.34 |                                            | 100 |                                        | 75  |                                                       | 25  |     |     |                       | 31.3 |                               | 5.3 |                          |     |
| 12               |      | 7.56 |                                            | 102 |                                        | 71  |                                                       | 31  |     |     |                       | 28.1 |                               | 7.8 |                          |     |
| 13               |      | 7.37 |                                            | 96  |                                        | 64  |                                                       | 32  |     |     |                       | 28.9 |                               | 5.8 |                          |     |
| 14               |      | 7.32 |                                            | 96  |                                        | 75  |                                                       | 21  |     |     |                       | 28.9 |                               | 5.8 |                          |     |
| 15               |      | 7.46 |                                            | 98  |                                        | 73  |                                                       | 25  |     |     |                       | 28.9 |                               | 6.3 |                          |     |
| 16               |      | 7.47 |                                            | 96  |                                        | 66  |                                                       | 30  |     |     |                       | 28.9 |                               | 5.8 |                          |     |
| 17               |      | 7.32 |                                            | 96  |                                        | 71  |                                                       | 25  |     |     |                       | 29.7 |                               | 5.3 |                          |     |
| 18               |      | 7.30 |                                            | 98  |                                        | 73  |                                                       | 25  |     |     |                       | 31.3 |                               | 4.9 |                          |     |
| 19               |      | 7.28 |                                            | 100 |                                        | 72  |                                                       | 28  |     |     |                       | 28.9 |                               | 6.8 |                          |     |
| 20               |      | n.s  |                                            | n.s |                                        | n.s |                                                       | n.s |     |     |                       | n.s  |                               | n.s |                          |     |
| 21               |      | 7.34 |                                            | 98  |                                        | 74  |                                                       | 24  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 22               |      | 7.26 |                                            | 98  |                                        | 72  |                                                       | 26  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 23               |      | 7.25 |                                            | 98  |                                        | 71  |                                                       | 27  |     |     |                       | 29.7 |                               | 5.8 |                          |     |
| 24               |      | 7.46 |                                            | 96  |                                        | 71  |                                                       | 25  |     |     |                       | 29.7 |                               | 5.3 |                          |     |
| 25               |      | 7.39 |                                            | 96  |                                        | 75  | 0                                                     | 21  |     |     |                       | 29.7 |                               | 5.3 |                          |     |
| 26               | 8.31 | 7.28 | 255                                        | 98  | 200                                    | 73  | 55                                                    | 25  |     |     | 77.9                  | 29.7 | 13.6                          | 5.8 | 48                       | 24  |
| 27               | 8.34 | 7.32 | 249                                        | 98  | 199                                    | 70  | 50                                                    | 28  |     |     | 75.4                  | 30.5 | 14.6                          | 5.8 | 42                       | 32  |
| 28               | 8.39 | 8.46 | 247                                        | 92  | 205                                    | 60  | 42                                                    | 32  |     |     | 82.6                  | 46.5 | 9.8                           | 8.3 | 43                       | 68  |
| 29               | 8.46 | 7.35 | 230                                        | 98  | 190                                    | 70  | 40                                                    | 28  |     |     | 76.2                  | 30.5 | 9.7                           | 5.3 |                          |     |
| 30               | 8.41 | 7.30 | 248                                        | 98  | 208                                    | 73  | 40                                                    | 25  |     |     | 72.1                  | 29.7 | 17.5                          | 5.8 | 45                       | 17  |
| AVG              |      | 7.42 |                                            | 98  |                                        | 72  |                                                       | 26  |     |     |                       | 30.4 |                               | 5.9 |                          |     |
| MAX              |      | 8.46 |                                            | 102 |                                        | 76  |                                                       | 32  |     |     |                       | 46.5 |                               | 8.3 |                          |     |
| MIN              |      | 7.25 |                                            | 92  |                                        | 60  |                                                       | 21  |     |     |                       | 28.1 |                               | 4.9 |                          |     |

n.s. = no sample collected/tested



## Bacteriological &amp; Physical Parameters

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| D<br>A<br>T<br>E                  | Total Coliform |        |      |          |         |         |    | Standard Plate Count |     | Wind Direction | Temp deg.C | Color |     | Odor |     |
|-----------------------------------|----------------|--------|------|----------|---------|---------|----|----------------------|-----|----------------|------------|-------|-----|------|-----|
|                                   | Plant Tap      |        |      |          |         |         |    | Raw                  | Tap |                |            | Raw   | Tap | Raw  | Tap |
|                                   | B&P            | C.F.E. | Dort | 3MG Well | C.S. #2 | Lab Tap |    |                      |     |                |            |       |     |      |     |
|                                   |                |        |      |          |         |         |    |                      |     |                |            |       |     |      |     |
| 60                                | 61             | 62     | 63   | 64       | 65      | 66      | 67 | 68                   | 69  | 70             | 71         | 72    | 73  | 74   |     |
| 1                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.1       |       |     |      |     |
| 2                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.1       |       |     |      |     |
| 3                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 11.7       |       |     |      |     |
| 4                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 11.7       |       |     |      |     |
| 5                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.9       |       |     |      |     |
| 6                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.7       |       |     |      |     |
| 7                                 | 0/0            |        | 0/0  | 0/0      | 0/0     | 2/0     |    |                      |     |                | 11.3       |       |     |      |     |
| 8                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.9        |       |     |      |     |
| 9                                 | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.2       |       |     |      |     |
| 10                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      | < 2 |                | 8.8        |       |     |      |     |
| 11                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.1        |       |     |      |     |
| 12                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.1       |       |     |      |     |
| 13                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.8        |       |     |      |     |
| 14                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 9.9        |       |     |      |     |
| 15                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 8.9        |       |     |      |     |
| 16                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 10.6       |       |     |      |     |
| 17                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 9.4        |       |     |      |     |
| 18                                | 1/0            |        | 1/0  | 0/0      | 1/0     | 2/0     |    |                      |     |                | 9.2        |       |     |      |     |
| 19                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 8.3        |       |     |      |     |
| 20                                | 0/0            |        | 0/0  | 0/0      | 0/0     | 0/0     |    |                      |     |                | n.s        |       |     |      |     |
| 21                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 8.1        |       |     |      |     |
| 22                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 7.7        |       |     |      |     |
| 23                                | 1/0            |        | 2/0  | 0/0      | 2/0     | 2/0     |    |                      |     |                | 9.3        |       |     |      |     |
| 24                                | 1/0            |        | 2/0  | 2/0      | 2/0     | 2/0     |    |                      |     |                | 8.7        |       |     |      |     |
| 25                                | 1/0            | 10/0   | 0/0  | 1/0      | n/a     | 1/0     |    |                      | < 2 |                | 8.7        |       |     |      |     |
| 26                                | 1/0            | 12/0   | 0/0  | 1/0      | n/a     | 1/0     |    | > 1476               | < 2 |                | 9.0        |       |     |      |     |
| 27                                | 1/0            | 12/0   | 0/0  | 1/0      | n/a     | 1/0     |    | 142                  | < 2 |                | 8.8        |       |     |      |     |
| 28                                | 1/0            | 12/0   | 0/0  | 1/0      | n/a     | 1/0     |    | 532                  | < 2 |                | 7.9        |       |     |      |     |
| 29                                | 1/0            | 4/0    | 0/0  | 1/0      | n/a     | 1/0     |    |                      | < 2 |                | 8.5        |       |     |      |     |
| 30                                | 1/0            | 6/0    | 0/0  | 1/0      | n/a     | 1/0     |    | 1246                 | < 2 |                | 10.3       |       |     |      |     |
| C.F.E. = Combined Filter Effluent |                |        |      |          |         |         |    |                      |     |                | 9.6        |       |     |      |     |
|                                   |                |        |      |          |         |         |    |                      |     |                | 11.7       |       |     |      |     |
|                                   |                |        |      |          |         |         |    |                      |     |                | 7.7        |       |     |      |     |

n.s. = no sample collected/tested



## Distribution System Monitoring

WSSN 2310

Apr-14

[illegible]



## Distribution System Monitoring

WSSN 2310

**Apr-14**

[illegible]



# ROUTINE POSITIVE DISTRIBUTION SAMPLES

Apr-14

| Total number of positive routine samples:              |                    |                |                | Total Coliform: <u>0</u> |                                          | Fecal Coliform: <u>0</u> |                |
|--------------------------------------------------------|--------------------|----------------|----------------|--------------------------|------------------------------------------|--------------------------|----------------|
| Date                                                   | Monitoring Station | Total Coliform | Fecal Coliform | Date                     | Retest of Station, Upstream & Downstream | Total Coliform           | Fecal Coliform |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
|                                                        |                    |                |                |                          |                                          |                          |                |
| Total number of routine distribution samples analyzed: |                    |                |                | 114                      |                                          |                          |                |
| Total number of routine distribution samples required: |                    |                |                | 100                      |                                          |                          |                |

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, July 06, 2015 2:28 PM  
**To:** prysbym@michigan.gov  
**Subject:** FW: Bios for Mike Schock and Darren Lytle from EPA's Office of Research and Development

FYI.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, July 06, 2015 12:50 PM  
**To:** 'Crooks, Jennifer'  
**Subject:** RE: Bios for Mike Schock and Darren Lytle from EPA's Office of Research and Development

I passed the bio info for Mike and Darren on this morning. Not sure if the City has any intention to utilize them at this point.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, June 29, 2015 3:54 PM  
**To:** 'Crooks, Jennifer'; Prysby, Mike (DEQ); Cook, Pat (DEQ)  
**Cc:** Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ)  
**Subject:** RE: Bios for Mike Schock and Darren Lytle from EPA's Office of Research and Development

Jennifer,

Mike has been out and won't likely return until next Monday 7/6. I have not been in touch with the City on this yet. The City's Pb/Cu monitoring period ends tomorrow 6/30, so by 7/10 we should also have a better idea where the City stands.

As you saw from the June 9, TTHM MCL VN, only one compliance sample (out of 24) in the last 9 months exceeded 80 ppb (Site DBP4, 94 ppb, 11/20/14).

TOC removal has been effective at the WTP, and with the upcoming GAC filter media changeout should be even more effective.

Total Coliform has not been an issue for the last 9 months, since September 2014, and work on the distribution system has improved chlorine residuals (with additional transmission main work planned over the next couple of years).

So at this point I don't think we have any questions.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

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**From:** Crooks, Jennifer [<mailto:crooks.jennifer@epa.gov>]  
**Sent:** Friday, June 26, 2015 5:41 PM  
**To:** Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)  
**Cc:** Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ)  
**Subject:** Bios for Mike Schock and Darren Lytle from EPA's Office of Research and Development

Steve and Mike; referring to the bios I sent you all last Monday, 6/22, of Mike Schock and Darren Lytle, I was wondering if you've had a chance to discuss Mike and Darren's participation in evaluating treatment/water quality/lead levels with the City of Flint?

Perhaps I can answer any questions you might have about their participation with you all?

Jennifer



**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, June 23, 2014 8:26 AM  
**To:** Shekter Smith, Liane (DEQ); Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Briefing -- Flint River for drinking water, Michigan  
**Attachments:** Flint River Test Run Phase2 5 July 2013.pdf; GENESEE-2014-05-30.pdf; GENESEE-2014-05-27.pdf; Flint04-2014MOR.pdf

FYI. From Jennifer.

(Not sure what "numerous" means. ATSDR is Agency for Toxic Substances and Disease Registry.)

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Crooks, Jennifer [mailto:crooks.jennifer@epa.gov]  
**Sent:** Friday, June 20, 2014 4:07 PM  
**To:** Johnson, Mark  
**Cc:** Poy, Thomas; Prysby, Mike (DEQ); Busch, Stephen (DEQ); Shoven, Heather; Murphy, Thomas  
**Subject:** Briefing -- Flint River for drinking water, Michigan

Mark—as we discussed earlier this week, below is a briefing containing the information we discussed regarding the Flint, Michigan water supply. I am out of the office this coming week; if you have questions, please contact Tom Poy, Ground Water and Drinking Water Branch Chief.

Thank you for your time!

Jennifer

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Drinking Water in Flint, Michigan

**ISSUE:** Flint began pumping/treating/distributing Flint River water as their drinking water source on April 25, 2014, and beginning in mid-May, there have been numerous complaints to the Region 5 Ground Water and Drinking Water Branch regarding the drinking water, including rotten egg smell, swamp water smell, people developing rashes. The Region immediately contacted and involved the Drinking Water program at the Michigan Dept of Environmental Quality (MDEQ).

**BACKGROUND:** Flint has been purchasing finished drinking water from Detroit for decades (source water is Lake Huron). It has been delivered by a large single pipeline from Detroit. In the late 1980's, the State drinking water staff requested that Flint renovate their old surface water treatment plant to meet the State's redundancy requirements, in case the single pipeline from Detroit was unable to transmit finished drinking water. Flint would treat Flint River water periodically throughout the year, to verify that the water treatment plant (WTP) was able to treat Flint River water that met Safe Drinking Water Act (SDWA) standards.

Over the past 15 years or so, Detroit has seen a decrease in its City population, and an increase in poverty/low income residents. Detroit currently has an Emergency Manager due to poor financial situation. (As an aside, last year the City of Highland Park told Detroit it was unable to pay its water/sewer bills, and currently has an Emergency Manager. Highland Park was unable to obtain funding to retrofit its surface water treatment plant, so Detroit is providing water/sewer currently to Highland Park for free.) In order to continue to provide adequately treated water that meets SDWA Health standards, the suburbs have been subsidizing the lower income residents for years. Consequently, communities like Flint have decided to find an alternate source of drinking water.

A regional water authority was formed in 2010, the Karegnondi Water Authority (KWA), which will serve water in mid-Michigan and the Thumb areas. Members of the KWA include Flint, Lapeer; and Genesee, Lapeer and Sanilac Counties. The KWA is currently constructing the Karegnondi pipeline to bring raw water from Lake Huron. It will be completed in about 2 years. Flint has an Emergency Manager now, and I think on paper, it looked like a savings to pump and treat Flint River water for the 2-year interim period prior to connecting to the Karegnondi pipeline, than to continue to pay Detroit prices for finished drinking water. MDEQ has worked long and hard with the City of Flint and water operators to get the WTP ready to treat Flint River water for the next few years. Complete operation/treatment began April 25, 2014.

In mid-May, Region 5 Ground Water and Drinking Water Branch began receiving calls from Flint citizens regarding the quality of the Flint drinking water. Complaints include rotten egg smell, swamp water smell, people developing rashes. I talked with Richard Benzie, the Community Drinking Water Unit Chief, at MDEQ about any possible chemical releases into the Flint River, and neither he nor Mike Prysby, the Lansing District engineer for Flint, have heard of anything such as this. The normal procedure of chemical releases is that Mike Prysby and Richard would be alerted/notified through the Pollution Emergency Alert System (PEAS), and that hasn't happened.

Mike Prysby has been working quite closely with the Operator-in-Charge at the Flint Water Treatment plant to prepare the WTP and operators to treat the Flint River water. Attached are several analytical results: July 2013 Test Run of Phase 2/5 contaminants conducted on the Flint River, sampled in July 2013; no exceedances are noted; detects of barium and selenium. The April 2014 Monthly Operation Report (MOR) which includes bacteriological analyses, was finalized in mid-May (includes only April 25-30 operation activity) with the following test results (sampled in May 2014), that were provided last week by Steve Busch, the MDEQ Supervising District Engineer: Total Organic Carbon (TOC), Metals, Volatile Organic Carbon (VOC), Synthetic Organic Contaminants (SOC) (all 3 categories), and partial chemistry (which includes nitrates). As the WTP only operated for the last 6 days in April, the MOR results provide limited information. The Bacteriological Portion of the May Operating Period were due 6/10, but the operational monitoring won't be reported until 6/30.

**FINDINGS:** So, bottom line—yes, the raw water is a different quality and more variable than Lake Huron raw water that Detroit is using. The Flint River is not as high a quality water as Lake Huron, but they are pretreating with ozone, conducting softening to reduce hardness and organic precursors, and are working with chlorine application. And, the Flint River is an interim source of raw water until the Karegnondi pipeline is constructed to bring raw Lake Huron water to Flint for treatment.

When you look at the July 2013 Test Run analyses attached, note:

The sample was taken at the Filter Effluent—normally it would be taken at the plant tap, but they were running Flint River water through most of the plant last summer to test treatment, and the filters were the last stop before the clear well/plant tap which were filled with Detroit water they were serving last year. Note: Trihalomethanes (TTHM) are detected, but no exceedances. Detects could be due to: Softening had not been introduced to the treatment process last summer which would reduce the hardness and also remove some of the organic precursor that would add to TTHM levels. Softening is being conducted now in the treatment process. Last summer, chlorine was added in mid-treatment which also could have added to the TTHM level. Now, chlorine is added just before the filters. Also, since it's summer surface water, there will be more run-off, thus more precursor in the raw water. Mike Prysby, the MDEQ District Engineer, believes that today's operation of the plant and quality of drinking water produced is much better than the

test runs done over the past year, due to the adjusting of the treatment, such as the softening process and the chlorine application.

Mike received Flint's first Monthly Operation Report (MOR) for the timeframe of April 25-30. Ozone pretreatment is provided to the raw water, and there is ozone destruction at the end of the pretreatment. The Filter Effluent has never been over 0.3 NTU, the ave range is 0.12-0.21 NTU. The chlorine residual at the plant tap is 0.9-1.0 free chlorine. The distribution chlorine residual ranged from 0.7-1.0 of free chlorine, which is acceptable. Bacti samples are pulled every 3-4 hours starting on April 25-30, and all were clear.

CONCLUSION: The analyses show some detects of regulated contaminants, but no exceedances. Thus, we have no report on any regulated contaminant that might be causing rashes, and the complaints we're hearing. I did ask Steve Busch at MDEQ, if there was a possibility of the existence of cyanotoxins from algae on the Flint River. Steve has worked with systems in Southeast Michigan and with Ohio EPA on algae issues, and he didn't think the conditions of the Flint River would support an algae bloom that would cause cyanotoxins to be present.

We would like to know if ATSDR would be interested in looking into this situation, to determine if there are other unregulated contaminants causing complaints of poor water quality.

Mike Prysby: 517-290-8817; [prysbym@michigan.gov](mailto:prysbym@michigan.gov).

Steve Busch: 517-643-2314; [buschs@michigan.gov](mailto:buschs@michigan.gov)

Jennifer

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# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY DRINKING WATER LABORATORY

USEPA Region V Drinking Water Cert. No. MI000003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

Sample Number

LE83917

## Official Laboratory Report

Report To: MICHAEL GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

System Name/Owner: CITY OF FLINT  
Collection Address: 4500 N DORT HWY, FLINT  
Collected By: MICHAEL GLASGOW  
Township/Well#/Section: //  
County: Genesee  
Sample Point: FILTER EFFLUENT  
Water System: Other

WSSN/Pool ID: 2310  
Source: TYPE III  
Site Code: FILTER EFF  
Collector: Public Water Supply Operator  
Date Collected: 07/18/2013 07:30  
Date Received: 07/18/2013 12:23  
Purpose: Routine Monitoring

| TESTING INFORMATION           |               |             |           | REGULATORY INFORMATION |                           |            |
|-------------------------------|---------------|-------------|-----------|------------------------|---------------------------|------------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L) | MCL/AL (mg/L)          | Method                    | CAS #      |
| Antimony                      | Not detected  | 07/19/2013  | 0.0006    | 0.006                  | EPA 200.8                 | 7440-38-0  |
| Arsenic                       | Not detected  | 07/19/2013  | 0.002     | 0.010                  | EPA 200.8                 | 7440-38-2  |
| Barium                        | 0.04          | 07/19/2013  | 0.01      | 2                      | EPA 200.8                 | 7440-39-3  |
| Beryllium                     | Not detected  | 07/19/2013  | 0.0004    | 0.004                  | EPA 200.8                 | 7440-41-7  |
| Cadmium                       | Not detected  | 07/19/2013  | 0.0003    | 0.005                  | EPA 200.8                 | 7440-43-9  |
| Chloride                      | 72            | 07/18/2013  | 4         |                        | SM 4500-Cl E              | 7647-14-5  |
| Chromium                      | Not detected  | 07/19/2013  | 0.01      | 0.1                    | EPA 200.8                 | 7440-47-3  |
| Cyanide-Available             | Not Detected  | 07/26/2013  | 0.02      | 0.2                    | OIA-1677                  | 57-12-5    |
| Fluoride                      | 0.13          | 07/18/2013  | 0.1       | 4.0                    | SM 4500 FC                | 16984-48-8 |
| Hardness as CaCO <sub>3</sub> | 168           | 07/18/2013  | 20        |                        | SM 2340 C                 | HARD-00-C  |
| Iron (automated)              | Not detected  | 07/18/2013  | 0.1       |                        | SM 3500 FeB               | 7439-89-6  |
| Lead                          | Not detected  | 07/19/2013  | 0.001     | 0.015                  | EPA 200.8                 | 7439-92-1  |
| Mercury                       | Not detected  | 07/19/2013  | 0.0001    | 0.002                  | EPA 200.8                 | 7439-97-6  |
| Nickel                        | Not detected  | 07/19/2013  | 0.01      | 0.1                    | EPA 200.8                 | 7440-02-0  |
| Nitrate as N                  | 0.5           | 07/18/2013  | 0.4       | 10                     | 10-107-04-2-B             | 14797-55-8 |
| Nitrite as N                  | Not detected  | 07/18/2013  | 0.05      | 1                      | 10-107-04-2-B             | 14797-65-0 |
| Selenium                      | Not Detected  | 07/19/2013  | 0.001     | 0.05                   | EPA 200.8                 | 7782-49-2  |
| Sodium (automated)            | 13            | 07/18/2013  | 5         |                        | SM 3500 NaB               | 7440-23-5  |
| Sulfate                       | 12            | 07/18/2013  | 10        |                        | SM 4500 SO <sub>4</sub> E | 14808-79-8 |
| Thallium                      | Not detected  | 07/19/2013  | 0.0002    | 0.002                  | EPA 200.8                 | 7440-28-0  |

### Carbamates by HPLC

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pleper  
Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909

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Sample Number

LE83917



| TESTING INFORMATION                      |               |             | REGULATORY INFORMATION |               |           |            |
|------------------------------------------|---------------|-------------|------------------------|---------------|-----------|------------|
| Analyte Name                             | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method    | CAS #      |
| <b>Carbamates by HPLC</b>                |               |             |                        |               |           |            |
| 3 Hydroxycarbofuran                      | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 531.2 | 16655-82-6 |
| Aldicarb                                 | Not Detected  | 07/23/2013  | 0.0005                 |               | EPA 531.2 | 116-06-3   |
| Aldicarb sulfone                         | Not Detected  | 07/23/2013  | 0.0005                 |               | EPA 531.2 | 1646-88-4  |
| Aldicarb sulfoxide                       | Not Detected  | 07/23/2013  | 0.0005                 |               | EPA 531.2 | 1646-87-3  |
| Carbaryl                                 | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 531.2 | 63-25-2    |
| Carbofuran                               | Not Detected  | 07/23/2013  | 0.0005                 | 0.04          | EPA 531.2 | 1563-66-2  |
| Methiocarb                               | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 531.2 | 2032-65-7  |
| Methomyl                                 | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 531.2 | 16752-77-5 |
| Oxamyl                                   | Not Detected  | 07/23/2013  | 0.001                  | 0.2           | EPA 531.2 | 23135-22-0 |
| Propoxur                                 | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 531.2 | 114-26-1   |
| <b>Chlorinated Acid Herbicides</b>       |               |             |                        |               |           |            |
| 2,4,5-T                                  | Not Detected  | 07/24/2013  | 0.002                  |               | EPA 515.4 | 93-76-5    |
| 2,4,5-TP (silvex)                        | Not Detected  | 07/24/2013  | 0.0003                 | 0.05          | EPA 515.4 | 93-72-1    |
| 2,4-D                                    | Not Detected  | 07/24/2013  | 0.002                  | 0.07          | EPA 515.4 | 94-75-7    |
| Acifluorfen                              | Not Detected  | 07/24/2013  | 0.004                  |               | EPA 615.4 | 50594-66-6 |
| Antazon                                  | Not Detected  | 07/24/2013  | 0.002                  |               | EPA 515.4 | 25057-89-0 |
| Carbamba                                 | Not Detected  | 07/24/2013  | 0.002                  |               | EPA 515.4 | 1918-00-9  |
| Dinoseb                                  | Not Detected  | 07/24/2013  | 0.0003                 | 0.007         | EPA 515.4 | 88-85-7    |
| Pentachlorophenol                        | Not Detected  | 07/24/2013  | 0.00006                | 0.001         | EPA 515.4 | 87-86-5    |
| Picloram                                 | Not Detected  | 07/24/2013  | 0.001                  | 0.5           | EPA 515.4 | 1918-02-1  |
| Total DCPA degradates, mono- and di-acid | Not Detected  | 07/24/2013  | 0.001                  |               | EPA 515.4 | 1861-32-1  |
| <b>Pesticides Analysis by GC/MS</b>      |               |             |                        |               |           |            |
| 4,4'-DDD                                 | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 525.2 | 72-54-8    |
| 4,4'-DDE                                 | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 525.2 | 72-55-9    |
| 4,4'-DDT                                 | Not Detected  | 07/23/2013  | 0.0005                 |               | EPA 525.2 | 50-29-3    |
| Acetochlor                               | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 525.2 | 34256-82-1 |
| Alachlor                                 | Not Detected  | 07/23/2013  | 0.0002                 | 0.002         | EPA 525.2 | 15972-60-8 |
| Aldrin                                   | Not Detected  | 07/23/2013  | 0.0004                 |               | EPA 525.2 | 309-00-2   |
| alpha-Chlordane                          | Not Detected  | 07/23/2013  | 0.0002                 | 0.002         | EPA 525.2 | 5103-71-9  |
| Atrazine                                 | 0.0005        | 07/23/2013  | 0.0002                 | 0.003         | EPA 525.2 | 1912-24-9  |
| Dieldrin                                 | Not Detected  | 07/23/2013  | 0.0005                 |               | EPA 525.2 | 60-57-1    |
| Endrin                                   | Not Detected  | 07/23/2013  | 0.0001                 | 0.002         | EPA 525.2 | 72-20-8    |
| Endrin aldehyde                          | Not Detected  | 07/23/2013  | 0.001                  |               | EPA 525.2 | 7421-93-4  |
| gamma-Chlordane                          | Not Detected  | 07/23/2013  | 0.0002                 | 0.002         | EPA 525.2 | 5103-74-2  |
| Heptachlor                               | Not Detected  | 07/23/2013  | 0.0002                 | 0.0004        | EPA 525.2 | 76-44-8    |
| Heptachlor epoxide                       | Not Detected  | 07/23/2013  | 0.0001                 | 0.0002        | EPA 525.2 | 1024-57-3  |
| Hexachlorobenzene                        | Not Detected  | 07/23/2013  | 0.0001                 | 0.001         | EPA 525.2 | 118-74-1   |

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

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Sample Number

LE83917



| TESTING INFORMATION |               |             | REGULATORY INFORMATION |               |        |       |
|---------------------|---------------|-------------|------------------------|---------------|--------|-------|
| Analyte Name        | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method | CAS # |

**Pesticides Analysis by GC/MS**

|                                   |              |            |        |        |           |            |
|-----------------------------------|--------------|------------|--------|--------|-----------|------------|
| Hexachlorocyclohexane (alpha-BHC) | Not Detected | 07/23/2013 | 0.001  |        | EPA 525.2 | 319-84-6   |
| Hexachlorocyclohexane (beta-BHC)  | Not Detected | 07/23/2013 | 0.001  |        | EPA 525.2 | 319-85-7   |
| Hexachlorocyclohexane (delta-BHC) | Not Detected | 07/23/2013 | 0.001  |        | EPA 525.2 | 319-86-8   |
| Hexachlorocyclopentadiene         | Not Detected | 07/23/2013 | 0.0005 | 0.05   | EPA 525.2 | 77-47-4    |
| Lindane (gamma-BHC)               | Not Detected | 07/23/2013 | 0.0001 | 0.0002 | EPA 525.2 | 58-89-9    |
| Methoxychlor                      | Not Detected | 07/23/2013 | 0.0001 | 0.04   | EPA 525.2 | 72-43-5    |
| Metolachlor                       | Not Detected | 07/23/2013 | 0.001  |        | EPA 525.2 | 51218-45-2 |
| Metribuzin                        | Not Detected | 07/23/2013 | 0.001  |        | EPA 525.2 | 21087-64-9 |
| Molinate                          | Not Detected | 07/23/2013 | 0.0005 |        | EPA 525.2 | 2212-67-1  |
| PCB (aroclor 1016)                | Not Detected | 07/23/2013 | 0.0001 | 0.0005 | EPA 525.2 | 12674-11-2 |
| PCB (aroclor 1221)                | Not Detected | 07/23/2013 | 0.0001 | 0.0005 | EPA 525.2 | 11104-28-2 |
| PCB (aroclor 1232)                | Not Detected | 07/23/2013 | 0.0001 | 0.0005 | EPA 525.2 | 11141-16-5 |
| PCB (aroclor 1242)                | Not Detected | 07/23/2013 | 0.0001 | 0.0005 | EPA 525.2 | 53469-21-9 |
| PCB (aroclor 1248)                | Not Detected | 07/23/2013 | 0.0001 | 0.0005 | EPA 525.2 | 12672-29-6 |
| PCB (aroclor 1254)                | Not Detected | 07/23/2013 | 0.0001 | 0.0005 | EPA 525.2 | 11097-69-1 |
| PCB (aroclor 1260)                | Not Detected | 07/23/2013 | 0.0001 | 0.0005 | EPA 525.2 | 11096-82-5 |
| Polychlorinated biphenyls         | Not Detected | 07/23/2013 | 0.0001 |        | EPA 525.2 | 59536-65-1 |
| Simazine                          | Not Detected | 07/23/2013 | 0.0002 | 0.004  | EPA 525.2 | 122-34-9   |
| Toxaphene                         | Not Detected | 07/23/2013 | 0.001  | 0.003  | EPA 525.2 | 8001-35-2  |

**Volatile Organic Compounds**

|                           |              |            |        |       |           |          |
|---------------------------|--------------|------------|--------|-------|-----------|----------|
| 1,1-Dichloroethane        | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 75-34-3  |
| 1,1-Dichloroethylene      | Not Detected | 07/25/2013 | 0.0005 | 0.007 | EPA 524.2 | 75-35-4  |
| 1,1-Dichloropropene       | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 563-58-6 |
| 1,1,1-Trichloroethane     | Not Detected | 07/25/2013 | 0.0005 | 0.2   | EPA 524.2 | 71-55-6  |
| 1,1,1,2-Tetrachloroethane | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 630-20-6 |
| 1,1,2-Trichloroethane     | Not Detected | 07/25/2013 | 0.0005 | 0.005 | EPA 524.2 | 79-00-5  |
| 1,1,2,2-Tetrachloroethane | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 79-34-5  |
| 1,2-Dichlorobenzene       | Not Detected | 07/25/2013 | 0.0005 | 0.6   | EPA 524.2 | 95-50-1  |
| 1,2-Dichloroethane        | Not Detected | 07/25/2013 | 0.0005 | 0.005 | EPA 524.2 | 107-06-2 |
| 1,2-Dichloropropane       | Not Detected | 07/25/2013 | 0.0005 | 0.005 | EPA 524.2 | 78-87-5  |
| 1,2,3-Trichlorobenzene    | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 87-61-6  |
| 1,2,3-Trichloropropane    | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 96-18-4  |
| 1,2,4-Trichlorobenzene    | Not Detected | 07/25/2013 | 0.0005 | 0.07  | EPA 524.2 | 120-82-1 |
| 1,2,4-Trimethylbenzene    | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 95-63-6  |
| 1,3-Dichlorobenzene       | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 541-73-1 |
| 1,3-Dichloropropane       | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 142-28-9 |
| 1,3,5-Trimethylbenzene    | Not Detected | 07/25/2013 | 0.0005 |       | EPA 524.2 | 108-67-8 |
| 1,4-Dichlorobenzene       | Not Detected | 07/25/2013 | 0.0005 | 0.075 | EPA 524.2 | 106-46-7 |

CAS#: Chemical Abstract Service Registry Number

MCL: Maximum Contaminant Level

AL: Action Level

RL: Reporting Limit

mg/L: milligrams / Liter (ppm)

ppm: parts per million

MPN: Most Probable Number

CFU: Colony Forming Unit

Laboratory Contacts

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Sample Number

LE83917

| TESTING INFORMATION               |               |             | REGULATORY INFORMATION |               |           |            |
|-----------------------------------|---------------|-------------|------------------------|---------------|-----------|------------|
| Analyte Name                      | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method    | CAS #      |
| <b>Volatile Organic Compounds</b> |               |             |                        |               |           |            |
| 2,2 Dichloropropane               | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 594-20-7   |
| Benzene                           | Not Detected  | 07/25/2013  | 0.0005                 | 0.005         | EPA 524.2 | 71-43-2    |
| Bromobenzene                      | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 108-86-1   |
| Bromochloromethane                | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 74-97-5    |
| Bromodichloromethane              | 0.029         | 07/25/2013  | 0.0005                 | 0.080         | EPA 524.2 | 75-27-4    |
| Bromoform                         | 0.0008        | 07/25/2013  | 0.0005                 | 0.080         | EPA 524.2 | 75-25-2    |
| Bromomethane                      | Not Detected  | 07/25/2013  | 0.001                  |               | EPA 524.2 | 74-83-9    |
| Carbon tetrachloride              | Not Detected  | 07/25/2013  | 0.0005                 | 0.005         | EPA 524.2 | 56-23-5    |
| Chlorobenzene                     | Not Detected  | 07/25/2013  | 0.0005                 | 0.1           | EPA 524.2 | 108-90-7   |
| Chlorodibromomethane              | 0.014         | 07/25/2013  | 0.0005                 | 0.080         | EPA 524.2 | 124-48-1   |
| Chloroethane                      | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 75-00-3    |
| Chloroform                        | 0.030         | 07/25/2013  | 0.0005                 | 0.080         | EPA 524.2 | 67-66-3    |
| Chloromethane                     | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 74-87-3    |
| cis-1,2 Dichloroethylene          | Not Detected  | 07/25/2013  | 0.0005                 | 0.07          | EPA 524.2 | 156-59-2   |
| cis-1,3 Dichloropropene           | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 10061-01-5 |
| Dibromomethane                    | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 74-95-3    |
| Chlorodifluoromethane             | Not Detected  | 07/25/2013  | 0.001                  |               | EPA 524.2 | 75-71-8    |
| Dichloromethane                   | Not Detected  | 07/25/2013  | 0.0006                 | 0.005         | EPA 524.2 | 75-09-2    |
| Ethylbenzene                      | Not Detected  | 07/25/2013  | 0.0005                 | 0.7           | EPA 524.2 | 100-41-4   |
| Fluorotrichloromethane            | Not Detected  | 07/25/2013  | 0.001                  |               | EPA 524.2 | 75-69-4    |
| Hexachlorobutadiene               | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 87-68-3    |
| Isopropylbenzene                  | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 98-82-8    |
| m & p-Xylene                      | Not Detected  | 07/25/2013  | 0.0005                 | 10            | EPA 524.2 | XYLMP-00-C |
| Methyl ethyl ketone               | Not Detected  | 07/25/2013  | 0.005                  |               | EPA 524.2 | 78-93-3    |
| Methyl isobutyl ketone            | Not Detected  | 07/25/2013  | 0.005                  |               | EPA 524.2 | 108-10-1   |
| Methyl-tert-butyl ether (MTBE)    | Not Detected  | 07/25/2013  | 0.001                  |               | EPA 524.2 | 1634-04-4  |
| Naphthalene                       | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 91-20-3    |
| n-Butylbenzene                    | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 104-51-8   |
| Nitrobenzene                      | Not Detected  | 07/25/2013  | 0.01                   |               | EPA 524.2 | 98-95-3    |
| n-Propylbenzene                   | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 103-65-1   |
| o-Chlorotoluene                   | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 95-49-8    |
| o-Xylene                          | Not Detected  | 07/25/2013  | 0.0005                 | 10            | EPA 524.2 | 95-47-6    |
| p-Chlorotoluene                   | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 106-43-4   |
| p-Isopropyltoluene                | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 99-87-6    |
| sec-Butylbenzene                  | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 135-98-8   |
| Styrene                           | Not Detected  | 07/25/2013  | 0.0005                 | 0.1           | EPA 524.2 | 100-42-5   |
| tert-Butylbenzene                 | Not Detected  | 07/25/2013  | 0.0005                 |               | EPA 524.2 | 98-06-6    |
| Tetrachloroethylene               | Not Detected  | 07/25/2013  | 0.0005                 | 0.005         | EPA 524.2 | 127-18-4   |

CAS#: Chemical Abstract Service Registry Number  
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MPN: Most Probable Number  
CFU: Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

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DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

**Sample Number**

**LE83917**



| TESTING INFORMATION               |                  |                | REGULATORY INFORMATION |                  |           |            |
|-----------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                      | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Volatile Organic Compounds</b> |                  |                |                        |                  |           |            |
| Tetrahydrofuran                   | Not Detected     | 07/25/2013     | 0.005                  |                  | EPA 524.2 | 109-99-9   |
| Toluene                           | Not Detected     | 07/25/2013     | 0.0005                 | 1                | EPA 524.2 | 108-88-3   |
| Total Trihalomethanes             | 0.074            | 07/25/2013     | NA                     | 0.080            | EPA 524.2 | THM-00-C   |
| Total Xylenes                     | Not Detected     | 07/25/2013     | NA                     | 10               | EPA 524.2 | 1330-20-7  |
| trans-1,2 Dichloroethylene        | Not Detected     | 07/25/2013     | 0.0005                 | 0.1              | EPA 524.2 | 156-60-5   |
| trans-1,3 Dichloropropene         | Not Detected     | 07/25/2013     | 0.0005                 |                  | EPA 524.2 | 10061-02-6 |
| Trichloroethylene                 | Not Detected     | 07/25/2013     | 0.0005                 | 0.005            | EPA 524.2 | 79-01-6    |
| Vinyl chloride                    | Not Detected     | 07/25/2013     | 0.0004                 | 0.002            | EPA 524.2 | 75-01-4    |

A trip blank was not available for analysis with this sample. This sample contained acetone at an approximate concentration of 20 ppb.

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:

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**Sample Number**  
**LF19430**

**Official Laboratory Report**

Report To: MICHAEL GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT -WATER PLANT         | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 4500 N DORT HWY, FLINT             | Source:         | TYPE I                       |
| Collected By:           | MICHAEL GLASGOW                    | Site Code:      | LAB TAP                      |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 05/22/2014 08:30             |
| Sample Point:           | PLANT LAB TAP                      | Date Received:  | 05/22/2014 13:19             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION |               |             | REGULATORY INFORMATION |               |               |            |
|---------------------|---------------|-------------|------------------------|---------------|---------------|------------|
| Analyte Name        | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method        | CAS #      |
| Antimony            | Not detected  | 05/23/2014  | 0.0006                 | 0.006         | EPA 200.8     | 7440-36-0  |
| Arsenic             | Not detected  | 05/23/2014  | 0.002                  | 0.010         | EPA 200.8     | 7440-38-2  |
| Barium              | 0.03          | 05/23/2014  | 0.01                   | 2             | EPA 200.8     | 7440-39-3  |
| Beryllium           | Not detected  | 05/23/2014  | 0.0004                 | 0.004         | EPA 200.8     | 7440-41-7  |
| Cadmium             | Not detected  | 05/23/2014  | 0.0003                 | 0.005         | EPA 200.8     | 7440-43-9  |
| Chloride            | 79            | 05/22/2014  | 4                      |               | SM 4500-Cl E  | 7647-14-5  |
| Chromium            | Not detected  | 05/23/2014  | 0.01                   | 0.1           | EPA 200.8     | 7440-47-3  |
| Cyanide-Available   | Not Detected  | 05/27/2014  | 0.02                   | 0.2           | OIA-1677      | 57-12-5    |
| Fluoride            | 0.16          | 05/22/2014  | 0.1                    | 4.0           | SM 4500 FC    | 16984-48-8 |
| Hardness as CaCO3   | 209           | 05/22/2014  | 20                     |               | SM 2340 C     | HARD-00-C  |
| Iron (automated)    | Not detected  | 05/22/2014  | 0.1                    |               | SM 3500 FeB   | 7439-89-6  |
| Lead                | Not detected  | 05/23/2014  | 0.001                  | 0.015         | EPA 200.8     | 7439-92-1  |
| Mercury             | Not detected  | 05/23/2014  | 0.0001                 | 0.002         | EPA 200.8     | 7439-97-6  |
| Nickel              | Not detected  | 05/23/2014  | 0.01                   | 0.1           | EPA 200.8     | 7440-02-0  |
| Nitrate as N        | 0.4           | 05/22/2014  | 0.4                    | 10            | 10-107-04-2-B | 14797-55-8 |
| Nitrite as N        | Not detected  | 05/22/2014  | 0.05                   | 1             | 10-107-04-2-B | 14797-65-0 |
| Selenium            | Not Detected  | 05/23/2014  | 0.001                  | 0.05          | EPA 200.8     | 7782-49-2  |
| Sodium (automated)  | 15            | 05/22/2014  | 5                      |               | SM 3500 NaB   | 7440-23-5  |
| Sulfate             | 25            | 05/22/2014  | 10                     |               | SM 4500 SO4E  | 14808-79-8 |
| Thallium            | Not detected  | 05/23/2014  | 0.0002                 | 0.002         | EPA 200.8     | 7440-28-0  |

**Carbamates by HPLC**

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CFU : Colony Forming Unit

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Systems Mgmt. Unit Mgr: George Krisztian

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Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562



**Sample Number**  
**LF19430**

| TESTING INFORMATION                      |                  |                | REGULATORY INFORMATION |                  |           |            |
|------------------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                             | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Carbamates by HPLC</b>                |                  |                |                        |                  |           |            |
| 3 Hydroxycarbofuran                      | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 16655-82-6 |
| Aldicarb                                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 531.2 | 116-06-3   |
| Aldicarb sulfone                         | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 531.2 | 1646-88-4  |
| Aldicarb sulfoxide                       | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 531.2 | 1646-87-3  |
| Carbaryl                                 | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 63-25-2    |
| Carbofuran                               | Not Detected     | 05/27/2014     | 0.0005                 | 0.04             | EPA 531.2 | 1563-66-2  |
| Methiocarb                               | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 2032-65-7  |
| Methomyl                                 | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 16752-77-5 |
| Oxamyl                                   | Not Detected     | 05/27/2014     | 0.001                  | 0.2              | EPA 531.2 | 23135-22-0 |
| Propoxur                                 | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 531.2 | 114-26-1   |
| <b>Chlorinated Acid Herbicides</b>       |                  |                |                        |                  |           |            |
| 2,4,5-T                                  | Not Detected     | 05/23/2014     | 0.002                  |                  | EPA 515.4 | 93-76-5    |
| 2,4,5-TP (silvex)                        | Not Detected     | 05/23/2014     | 0.0003                 | 0.05             | EPA 515.4 | 93-72-1    |
| 2,4-D                                    | Not Detected     | 05/23/2014     | 0.002                  | 0.07             | EPA 515.4 | 94-75-7    |
| Acifluorfen                              | Not Detected     | 05/23/2014     | 0.004                  |                  | EPA 515.4 | 50594-66-6 |
| Bentazon                                 | Not Detected     | 05/23/2014     | 0.002                  |                  | EPA 515.4 | 25057-89-0 |
| Dicamba                                  | Not Detected     | 05/23/2014     | 0.002                  |                  | EPA 515.4 | 1918-00-9  |
| Dinoseb                                  | Not Detected     | 05/23/2014     | 0.0003                 | 0.007            | EPA 515.4 | 88-85-7    |
| Pentachlorophenol                        | Not Detected     | 05/23/2014     | 0.00006                | 0.001            | EPA 515.4 | 87-86-5    |
| Picloram                                 | Not Detected     | 05/23/2014     | 0.001                  | 0.5              | EPA 515.4 | 1918-02-1  |
| Total DCPA degradates, mono- and di-acid | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 515.4 | 1861-32-1  |
| <b>Pesticides Analysis by GC/MS</b>      |                  |                |                        |                  |           |            |
| 4,4'-DDD                                 | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 72-54-8    |
| 4,4'-DDE                                 | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 72-55-9    |
| 4,4'-DDT                                 | Not Detected     | 05/23/2014     | 0.0005                 |                  | EPA 525.2 | 50-29-3    |
| Acetochlor                               | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 34256-82-1 |
| Alachlor                                 | Not Detected     | 05/23/2014     | 0.0002                 | 0.002            | EPA 525.2 | 15972-60-8 |
| Aldrin                                   | Not Detected     | 05/23/2014     | 0.0004                 |                  | EPA 525.2 | 309-00-2   |
| alpha-Chlordane                          | Not Detected     | 05/23/2014     | 0.0002                 | 0.002            | EPA 525.2 | 5103-71-9  |
| Atrazine                                 | Not Detected     | 05/23/2014     | 0.0002                 | 0.003            | EPA 525.2 | 1912-24-9  |
| Dieldrin                                 | Not Detected     | 05/23/2014     | 0.0005                 |                  | EPA 525.2 | 60-57-1    |
| Endrin                                   | Not Detected     | 05/23/2014     | 0.0001                 | 0.002            | EPA 525.2 | 72-20-8    |
| Endrin aldehyde                          | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 7421-93-4  |
| gamma-Chlordane                          | Not Detected     | 05/23/2014     | 0.0002                 | 0.002            | EPA 525.2 | 5103-74-2  |
| Heptachlor                               | Not Detected     | 05/23/2014     | 0.0002                 | 0.0004           | EPA 525.2 | 76-44-8    |
| Heptachlor epoxide                       | Not Detected     | 05/23/2014     | 0.0001                 | 0.0002           | EPA 525.2 | 1024-57-3  |
| Hexachlorobenzene                        | Not Detected     | 05/23/2014     | 0.0001                 | 0.001            | EPA 525.2 | 118-74-1   |

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**Sample Number**  
**LF19430**

| TESTING INFORMATION                 |                  |                | REGULATORY INFORMATION |                  |           |            |
|-------------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                        | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Pesticides Analysis by GC/MS</b> |                  |                |                        |                  |           |            |
| Hexachlorocyclohexane (alpha-BHC)   | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 319-84-6   |
| Hexachlorocyclohexane (beta-BHC)    | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 319-85-7   |
| Hexachlorocyclohexane (delta-BHC)   | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 319-86-8   |
| Hexachlorocyclopentadiene           | Not Detected     | 05/23/2014     | 0.0005                 | 0.05             | EPA 525.2 | 77-47-4    |
| Lindane (gamma-BHC)                 | Not Detected     | 05/23/2014     | 0.0001                 | 0.0002           | EPA 525.2 | 58-89-9    |
| Methoxychlor                        | Not Detected     | 05/23/2014     | 0.0001                 | 0.04             | EPA 525.2 | 72-43-5    |
| Metolachlor                         | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 51218-45-2 |
| Metribuzin                          | Not Detected     | 05/23/2014     | 0.001                  |                  | EPA 525.2 | 21087-64-9 |
| Molinate                            | Not Detected     | 05/23/2014     | 0.0005                 |                  | EPA 525.2 | 2212-67-1  |
| PCB (aroclor 1016)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 12674-11-2 |
| PCB (aroclor 1221)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11104-28-2 |
| PCB (aroclor 1232)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11141-16-5 |
| PCB (aroclor 1242)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 53469-21-9 |
| PCB (aroclor 1248)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 12672-29-6 |
| PCB (aroclor 1254)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11097-69-1 |
| PCB (aroclor 1260)                  | Not Detected     | 05/23/2014     | 0.0001                 | 0.0005           | EPA 525.2 | 11096-82-5 |
| Polybrominated biphenyls            | Not Detected     | 05/23/2014     | 0.0001                 |                  | EPA 525.2 | 59536-65-1 |
| Simazine                            | Not Detected     | 05/23/2014     | 0.0002                 | 0.004            | EPA 525.2 | 122-34-9   |
| Toxaphene                           | Not Detected     | 05/23/2014     | 0.001                  | 0.003            | EPA 525.2 | 8001-35-2  |
| <b>Volatile Organic Compounds</b>   |                  |                |                        |                  |           |            |
| 1,1 Dichloroethane                  | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 75-34-3    |
| 1,1 Dichloroethylene                | Not Detected     | 05/27/2014     | 0.0005                 | 0.007            | EPA 524.2 | 75-35-4    |
| 1,1 Dichloropropene                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 563-58-6   |
| 1,1,1 Trichloroethane               | Not Detected     | 05/27/2014     | 0.0005                 | 0.2              | EPA 524.2 | 71-55-6    |
| 1,1,1,2 Tetrachloroethane           | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 630-20-6   |
| 1,1,2 Trichloroethane               | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 79-00-5    |
| 1,1,2,2 Tetrachloroethane           | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 79-34-5    |
| 1,2 Dichlorobenzene                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.6              | EPA 524.2 | 95-50-1    |
| 1,2 Dichloroethane                  | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 107-06-2   |
| 1,2 Dichloropropane                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 78-87-5    |
| 1,2,3 Trichlorobenzene              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 87-61-6    |
| 1,2,3 Trichloropropane              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 96-18-4    |
| 1,2,4 Trichlorobenzene              | Not Detected     | 05/27/2014     | 0.0005                 | 0.07             | EPA 524.2 | 120-82-1   |
| 1,2,4 Trimethylbenzene              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 95-63-6    |
| 1,3 Dichlorobenzene                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 541-73-1   |
| 1,3 Dichloropropane                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 142-28-9   |
| 1,3,5 Trimethylbenzene              | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 108-67-8   |
| 1,4 Dichlorobenzene                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.075            | EPA 524.2 | 106-46-7   |

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**Sample Number**  
**LF19430**

| TESTING INFORMATION               |                  |                | REGULATORY INFORMATION |                  |           |            |
|-----------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                      | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Volatile Organic Compounds</b> |                  |                |                        |                  |           |            |
| 2,2 Dichloropropane               | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 594-20-7   |
| Benzene                           | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 71-43-2    |
| Bromobenzene                      | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 108-86-1   |
| Bromochloromethane                | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 74-97-5    |
| Bromodichloromethane              | 0.020            | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 75-27-4    |
| Bromoform                         | 0.0010           | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 75-25-2    |
| Bromomethane                      | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 74-83-9    |
| Carbon tetrachloride              | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 56-23-5    |
| Chlorobenzene                     | Not Detected     | 05/27/2014     | 0.0005                 | 0.1              | EPA 524.2 | 108-90-7   |
| Chlorodibromomethane              | 0.013            | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 124-48-1   |
| Chloroethane                      | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 75-00-3    |
| Chloroform                        | 0.022            | 05/27/2014     | 0.0005                 | 0.080            | EPA 524.2 | 67-66-3    |
| Chloromethane                     | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 74-87-3    |
| cis-1,2 Dichloroethylene          | Not Detected     | 05/27/2014     | 0.0005                 | 0.07             | EPA 524.2 | 156-59-2   |
| cis-1,3 Dichloropropene           | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 10061-01-5 |
| Dibromomethane                    | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 74-95-3    |
| Dichlorodifluoromethane           | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 75-71-8    |
| Dichloromethane                   | Not Detected     | 05/27/2014     | 0.0006                 | 0.005            | EPA 524.2 | 75-09-2    |
| Ethylbenzene                      | Not Detected     | 05/27/2014     | 0.0005                 | 0.7              | EPA 524.2 | 100-41-4   |
| Fluorotrichloromethane            | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 75-69-4    |
| Hexachlorobutadiene               | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 87-68-3    |
| Isopropylbenzene                  | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 98-82-8    |
| m & p-Xylene                      | Not Detected     | 05/27/2014     | 0.0005                 | 10               | EPA 524.2 | XYLMP-00-C |
| Methyl ethyl ketone               | Not Detected     | 05/27/2014     | 0.005                  |                  | EPA 524.2 | 78-93-3    |
| Methyl isobutyl ketone            | Not Detected     | 05/27/2014     | 0.005                  |                  | EPA 524.2 | 108-10-1   |
| Methyl-tert-butyl ether (MTBE)    | Not Detected     | 05/27/2014     | 0.001                  |                  | EPA 524.2 | 1634-04-4  |
| Naphthalene                       | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 91-20-3    |
| n-Butylbenzene                    | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 104-51-8   |
| Nitrobenzene                      | Not Detected     | 05/27/2014     | 0.01                   |                  | EPA 524.2 | 98-95-3    |
| n-Propylbenzene                   | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 103-65-1   |
| o-Chlorotoluene                   | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 95-49-8    |
| o-Xylene                          | Not Detected     | 05/27/2014     | 0.0005                 | 10               | EPA 524.2 | 95-47-6    |
| p-Chlorotoluene                   | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 106-43-4   |
| p-Isopropyltoluene                | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 99-87-6    |
| sec-Butylbenzene                  | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 135-98-8   |
| Styrene                           | Not Detected     | 05/27/2014     | 0.0005                 | 0.1              | EPA 524.2 | 100-42-5   |
| tert-Butylbenzene                 | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 98-06-6    |
| Tetrachloroethylene               | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 127-18-4   |
| Tetrahydrofuran                   | Not Detected     | 05/27/2014     | 0.005                  |                  | EPA 524.2 | 109-99-9   |

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003  
P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562

**Sample Number**  
**LF19430**

| TESTING INFORMATION               |                  |                | REGULATORY INFORMATION |                  |           |            |
|-----------------------------------|------------------|----------------|------------------------|------------------|-----------|------------|
| Analyte Name                      | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method    | CAS #      |
| <b>Volatile Organic Compounds</b> |                  |                |                        |                  |           |            |
| Toluene                           | Not Detected     | 05/27/2014     | 0.0005                 | 1                | EPA 524.2 | 108-88-3   |
| Total Trihalomethanes             | 0.056            | 05/27/2014     | NA                     | 0.080            | EPA 524.2 | TTHM-00-C  |
| Total Xylenes                     | Not Detected     | 05/27/2014     | NA                     | 10               | EPA 524.2 | 1330-20-7  |
| trans-1,2 Dichloroethylene        | Not Detected     | 05/27/2014     | 0.0005                 | 0.1              | EPA 524.2 | 156-60-5   |
| trans-1,3 Dichloropropene         | Not Detected     | 05/27/2014     | 0.0005                 |                  | EPA 524.2 | 10061-02-6 |
| Trichloroethylene                 | Not Detected     | 05/27/2014     | 0.0005                 | 0.005            | EPA 524.2 | 79-01-6    |
| Vinyl chloride                    | Not Detected     | 05/27/2014     | 0.0004                 | 0.002            | EPA 524.2 | 75-01-4    |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
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mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

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Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**



USEPA Region V Drinking Water Cert. No. MI00003  
P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562

**Sample Number**  
**LF19431**

**Official Laboratory Report**

Report To: MICHAEL GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT - WATER PLANT        | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 4500 N DORT HWY, FLINT             | Source:         | TYPE I                       |
| Collected By:           | MICHAEL GLASGOW                    | Site Code:      | PS4                          |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 05/22/2014 08:30             |
| Sample Point:           | SINK                               | Date Received:  | 05/22/2014 13:20             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION  |                  |                | REGULATORY INFORMATION |                  |          |          |
|----------------------|------------------|----------------|------------------------|------------------|----------|----------|
| Analyte Name         | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method   | CAS #    |
| Total Organic Carbon | 4.57             | 05/22/2014     | 0.5                    |                  | SM 5310C | TOC-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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**Flint, MI 48502-1540**  
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MCL : Maximum Contaminant Level  
AL : Action Level  
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mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

**Sample Number**

**LF19432**

**Official Laboratory Report**

Report To: MICHAEL GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

System Name/Owner: CITY OF FLINT/ WATER PLANT  
Collection Address: 4500 N DORT HWY, FLINT  
Collected By: MICHAEL GLASGOW  
Township/Well#/Section: //  
County: Genesee  
Sample Point: SINK  
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310  
Source: TYPE I  
Site Code: RAW  
Collector: Public Water Supply Operator  
Date Collected: 05/22/2014 08:30  
Date Received: 05/22/2014 13:20  
Purpose: Routine Monitoring

| TESTING INFORMATION  |                  |                | REGULATORY INFORMATION |                  |          |          |
|----------------------|------------------|----------------|------------------------|------------------|----------|----------|
| Analyte Name         | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method   | CAS #    |
| Total Organic Carbon | 10.3             | 05/22/2014     | 0.5                    |                  | SM 5310C | TOC-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
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AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

[illegible]



**Fluoridation &  
Chlorination**

 City of Flint Water Treatment Plant  
**WSSN: 2310**

April 2014

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| Date | Fluoride<br>Applied as<br>F- mg/L | Fluoride Analysis (mg/L) |      |       | Chlorine Application (mg/L) |               |                   | Chlorine Residual (mg/L) |       |           |       |      |       |
|------|-----------------------------------|--------------------------|------|-------|-----------------------------|---------------|-------------------|--------------------------|-------|-----------|-------|------|-------|
|      |                                   |                          |      |       | Intermediate<br>Chlorine    | Post Chlorine | Total<br>Chlorine | Filtered                 |       | 3 MG Well |       | Tap  |       |
|      |                                   | Raw                      | Tap  | Dist. |                             |               |                   | Free                     | Total | Free      | Total | Free | Total |
| 1    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 2    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 3    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 4    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 5    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 6    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 7    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 8    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 9    |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 10   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 11   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 12   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 13   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 14   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 15   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 16   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 17   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 18   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 19   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 20   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 21   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 22   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 23   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 24   |                                   |                          |      |       |                             |               |                   |                          |       |           |       |      |       |
| 25   | 0                                 | 0.14                     | 0.59 |       | 3.5                         | 0             | 3.5               | 1.8                      | 2.1   |           |       | 0.8  | 1.0   |
| 26   | 0                                 | 0.14                     | 0.53 |       | 3.5                         | 0             | 3.5               | 1.7                      | 1.9   |           |       | 0.9  | 1.1   |
| 27   | 0                                 | 0.13                     | 0.53 |       | 3.6                         | 0             | 3.6               | 1.7                      | 1.9   | 1.5       | 1.8   | 1.0  | 1.1   |
| 28   | 0                                 | 0.13                     | 0.19 |       | 3.7                         | 0             | 3.7               | 1.7                      | 1.9   | 1.4       | 1.8   | 0.9  | 1.0   |
| 29   | 0                                 | 0.15                     | 0.58 | 0.43  | 3.7                         | 0             | 3.7               | n/a                      | n/a   | n/a       | n/a   | 0.9  | 1.1   |
| 30   | 0                                 | 0.15                     | 0.62 |       | 3.5                         | 0             | 3.5               | 1.7                      | 2.0   | 1.5       | 1.8   | 1.0  | 1.1   |
| Avg. | 0                                 | 0.14                     | 0.51 | 0.43  | 3.6                         | 0             | 3.6               | 1.7                      | 2.0   | 1.5       | 1.8   | 0.9  | 1.1   |
| Max. | 0                                 | 0.15                     | 0.62 | 0.43  | 3.7                         | 0             | 3.7               | 1.8                      | 2.1   | 1.5       | 1.8   | 1.0  | 1.1   |
| Min. | 0                                 | 0.13                     | 0.19 | 0.43  | 3.5                         | 0             | 3.5               | 1.7                      | 1.9   | 1.4       | 1.8   | 0.8  | 1.0   |

## Chemical Analyses

City of Flint Water Treatment Plant  
WSSN: 2310

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| Date | pH (S.U.) |      | Total Hardness as CaCO <sub>3</sub> (mg/L) |     | Total Alkalinity as CaCO <sub>3</sub> (mg/L) |     | Non-Carbonate Hardness as CaCO <sub>3</sub> (mg/L) |     | Calcium as Ca <sup>2+</sup> (mg/L) |      | Magnesium as Mg <sup>2+</sup> (mg/L) |     | Chloride as Cl <sup>-</sup> (mg/L) |     |
|------|-----------|------|--------------------------------------------|-----|----------------------------------------------|-----|----------------------------------------------------|-----|------------------------------------|------|--------------------------------------|-----|------------------------------------|-----|
|      | Raw       | Tap  | Raw                                        | Tap | Raw                                          | Tap | Raw                                                | Tap | Raw                                | Tap  | Raw                                  | Tap | Raw                                | Tap |
| 1    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 2    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 3    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 4    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 5    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 6    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 7    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 8    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 9    |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 10   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 11   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 12   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 13   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 14   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 15   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 16   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 17   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 18   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 19   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 20   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 21   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 22   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 23   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 24   |           |      |                                            |     |                                              |     |                                                    |     |                                    |      |                                      |     |                                    |     |
| 25   |           | 7.39 |                                            | 96  |                                              | 75  |                                                    | 21  |                                    | 29.7 |                                      | 5.3 |                                    |     |
| 26   | 8.31      | 7.28 | 255                                        | 98  | 200                                          | 73  | 55                                                 | 25  | 77.9                               | 29.7 | 13.6                                 | 5.8 | 48                                 | 24  |
| 27   | 8.34      | 7.32 | 249                                        | 98  | 199                                          | 70  | 50                                                 | 28  | 75.4                               | 30.5 | 14.6                                 | 5.8 | 42                                 | 32  |
| 28   | 8.39      | 8.46 | 247                                        | 92  | 205                                          | 60  | 42                                                 | 32  | 82.6                               | 46.5 | 9.8                                  | 8.3 | 43                                 | 68  |
| 29   | 8.46      | 7.35 | 230                                        | 98  | 190                                          | 70  | 40                                                 | 28  | 76.2                               | 30.5 | 9.7                                  | 5.3 |                                    |     |
| 30   | 8.41      | 7.30 | 248                                        | 98  | 208                                          | 73  | 40                                                 | 25  | 72.1                               | 29.7 | 17.5                                 | 5.8 | 45                                 | 17  |
| Avg. | 8.38      | 7.52 | 246                                        | 97  | 200                                          | 70  | 45                                                 | 27  | 76.8                               | 32.8 | 13.0                                 | 6.1 | 45                                 | 35  |
| Max. | 8.46      | 8.46 | 255                                        | 98  | 208                                          | 75  | 55                                                 | 32  | 82.6                               | 46.5 | 17.5                                 | 8.3 | 48                                 | 68  |
| Min. | 8.31      | 7.28 | 230                                        | 92  | 190                                          | 60  | 40                                                 | 21  | 72.1                               | 29.7 | 9.7                                  | 5.3 | 42                                 | 17  |

Bacteriological &  
Physical ParametersCity of Flint Water Treatment Plant  
WSSN: 2310

April 2014

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| Date | Total Coliform     |       |                            |       |           |       | Standard Plate Count |     | Wind<br>Direction | Temp. C | Color |     | Odor |     |
|------|--------------------|-------|----------------------------|-------|-----------|-------|----------------------|-----|-------------------|---------|-------|-----|------|-----|
|      | Raw (Colilert MPN) |       | Filter Confluence<br>(N&S) |       | Plant Tap |       |                      |     |                   |         |       |     |      |     |
|      | # Samples          | Count | # Samples                  | # pos | # Samples | # pos | Raw                  | Tap |                   |         | Raw   | Raw | Tap  | Raw |
| 1    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 2    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 3    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 4    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 5    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 6    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 7    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 8    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 9    |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 10   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 11   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 12   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 13   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 14   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 15   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 16   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 17   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 18   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 19   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 20   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 21   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 22   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 23   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 24   |                    |       |                            |       |           |       |                      |     |                   |         |       |     |      |     |
| 25   | 1                  |       | 12                         | 0     | 1         | 0     |                      | < 2 |                   | 11.0    |       |     |      |     |
| 26   | 1                  |       | 12                         | 0     | 1         | 0     | > 1476               | < 2 |                   | 11.4    |       |     |      |     |
| 27   | 1                  |       | 12                         | 0     | 1         | 0     | 142                  | < 2 |                   | 11.1    |       |     |      |     |
| 28   | 1                  |       | 8                          | 0     | 1         | 0     | 532                  | < 2 |                   | 11.5    |       |     |      |     |
| 29   | 1                  |       | 0                          | 0     | 1         | 0     |                      | < 2 |                   | 12.1    |       |     |      |     |
| 30   | 1                  |       | 4                          | 0     | 1         | 0     | 1246                 | < 2 |                   | 13.5    |       |     |      |     |
| Avg. |                    |       |                            |       |           |       | n/a                  | < 2 |                   | 11.8    |       |     |      |     |
| Max. |                    |       |                            |       |           |       | > 1476               | < 2 |                   | 13.5    |       |     |      |     |
| Min. |                    |       |                            |       |           |       | 142                  | < 2 |                   | 11.0    |       |     |      |     |

**Distribution System  
Monitoring**

 City of Flint Water Treatment Plant  
**WSSN: 2310**

April 2014

Page 6

| Date | Free Chlorine Residual at Bacteriological Monitoring Stations mg/l |     |     |     |     |     |     |     |     |     | Number<br>of<br>Samples |
|------|--------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------------|
|      | 1                                                                  | 2   | 3   | 4   | 5   | 6   | 7   | 8   | CS  | WR  |                         |
| 1    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 2    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 3    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 4    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 5    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 6    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 7    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 8    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 9    |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 10   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 11   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 12   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 13   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 14   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 15   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 16   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 17   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 18   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 19   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 20   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 21   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 22   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 23   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 24   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 25   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 26   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 27   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 28   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 29   | 1.0                                                                | 0.8 | 1.0 | 0.7 | 0.8 | 0.8 | 1.1 | 0.8 | 0.7 | 0.9 | 10                      |
| 30   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |
| 31   |                                                                    |     |     |     |     |     |     |     |     |     | 0                       |

**Distribution Sample Summary**

|                                                  |     |
|--------------------------------------------------|-----|
| Total # of routine distribution samples analyzed | 115 |
| Total # of routine distribution samples required | 100 |

**Distribution Disinfectant Residual Summary**

|                                                         |     |
|---------------------------------------------------------|-----|
| Percent samples with a detectable disinfectant residual | 100 |
| Average disinfectant residual this month                | 0.9 |

**Distribution Bacteriological Summary**

|                                                  |   |
|--------------------------------------------------|---|
| Total # of positive routine distribution samples | 0 |
| Percent of routine distribution samples positive | 0 |

**Positive Distribution Samples**

| Date | Monitoring Station | Date | Repeat Monitoring Stations | Residual | Positive or Negative |
|------|--------------------|------|----------------------------|----------|----------------------|
|      |                    |      |                            |          |                      |
|      |                    |      |                            |          |                      |
|      |                    |      |                            |          |                      |
|      |                    |      |                            |          |                      |
|      |                    |      |                            |          |                      |

[illegible]

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, September 09, 2014 10:23 AM  
**To:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: Citizen complaint call from man who lives in Flint, MI

FYI. My response to Jennifer is below.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, September 09, 2014 10:19 AM  
**To:** 'Crooks, Jennifer'; Prysby, Mike (DEQ)  
**Cc:** Poy, Thomas; Benzie, Richard (DEQ)  
**Subject:** RE: Citizen complaint call from man who lives in Flint, MI

Jennifer,

The City has found two transmission valves that were closed (36 inch and 24 inch) which transport water to that section of the system. This likely contributed to more stagnant water conditions and lower chlorine residuals in that area. The 36 inch valve has been opened but the 24 inch is inoperable and will need to be repaired or replaced.

Given these valve issues, I have inquired whether low pressure conditions less than 35 psi, would be present in this portion of the system? If low pressure conditions exist, a cross connection or siphon condition where leaks or breaks are present may be occurring. While longer transmission times may contribute to lower chlorine residual, the presence of coliform bacteria suggests contaminants have entered the system and their regrowth and resurgence could be assisted by the presence of a biofilm or tuberculation on the pipe walls.

They are continuing to investigate to identify and address any such issues.

All 6 samples collected Saturday came back ND on Sunday, but we had 1 of 6 sites come back TC positive yesterday (collected Sunday) and they collected the normal full distribution set (10+1 samples) Monday which we expect results early this afternoon. If all results are ND today the BWA could be lifted.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Crooks, Jennifer [<mailto:crooks.jennifer@epa.gov>]  
**Sent:** Tuesday, September 09, 2014 10:00 AM  
**To:** Prysby, Mike (DEQ); Busch, Stephen (DEQ)  
**Cc:** Poy, Thomas; Benzie, Richard (DEQ)  
**Subject:** Citizen complaint call from man who lives in Flint, MI

Hi, Steve and Mike. We heard about the boil water advisory for Flint for 9/3 last week. Tom Poy also had several calls from Lathan Jefferson yesterday, re-iterating his past calls/claims that the Flint water is unfit to drink.

Any update as to the source of positive bacti? I heard no E.coli, which is good.

Thank you for your time

---

**From:** Murphy, Thomas  
**Sent:** Monday, September 08, 2014 1:48 PM  
**To:** Poy, Thomas  
**Cc:** Shoven, Heather; Crooks, Jennifer  
**Subject:** Citizen complaint call from man who lives in Flint, MI

I checked Flint's website and found the attached 9/3/2014 Boil Water Notice (affected area expanded on 9/5/2014) for an apparent monthly total coliform bacteria MCL violation.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, October 02, 2014 2:26 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov  
**Subject:** FW: CITY OF FLINT DRINKING WATER, GOVERNOR'S OFFICE BRIEFING PAPER  
**Attachments:** Governor Briefing - City of Flint 10-1-14.docx; Governor Briefing - City of Flint 10-1-14.pdf; Flint Monthly Pumpage Comparison.pdf; ODWMA-399-022.pdf

**Importance:** High

FYI. I didn't realize you didn't get cc'd.

Also want to say you both deserve a lot of credit for getting this done and out. It looks like we hit the nail on the head as there were no questions or modifications.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Thelen, Mary Beth (DEQ)  
**Sent:** Wednesday, October 01, 2014 11:58 AM  
**To:** Busch, Stephen (DEQ)  
**Cc:** Shekter Smith, Liane (DEQ); Willard, Veronica (DEQ)  
**Subject:** FW: CITY OF FLINT DRINKING WATER, GOVERNOR'S OFFICE BRIEFING PAPER  
**Importance:** High

Hi Stephen,

Here is the note and final version we sent to the Governor's office today.

Thanks Stephen for preparing! We just tweaked the briefing slightly before sending it out with headers, title, etc. You may want to replace your version with this one.

Mary Beth

Mary Beth Thelen  
 Management Assistant to Director Dan Wyant  
 Department of Environmental Quality  
 Constitution Hall, 6th Floor South  
 Phone: 517-284-6712 or 284-6700 (new numbers)  
 Fax: 517-241-7401  
[Thelenm2@michigan.gov](mailto:Thelenm2@michigan.gov)

---

**From:** Thelen, Mary Beth (DEQ)  
**Sent:** Wednesday, October 01, 2014 11:19 AM  
**To:** Scott, Allison (GOV); Muchmore, Dennis (GOV); Brader, Valerie (GOV)  
**Cc:** Wurfel, Brad (DEQ); Wyant, Dan (DEQ); Datema, Maggie (DEQ); Sygo, Jim (DEQ); Wisniewski, Wendy (GOV); West, Samantha (GOV)



**Subject:** CITY OF FLINT DRINKING WATER, GOVERNOR'S OFFICE BRIEFING PAPER

**Importance:** High

Dear Governor, Dennis, and Val:

Per your request, the attached briefing paper is on the City of Flint drinking water situation. Director Dan Wyant has asked that I send this to you. A Word version as well as a pdf version is attached. We have also included a copy of the policy ODWMA-399-022 which specifically provides guidance regarding boil water advisory situations, and a chart showing the significant increase in the City of Flint's water demands following the extreme conditions experienced this past winter.

Allison, please forward to the Governor. Thank you.

If you have any questions or need further information, please let us know. Thank you.

Mary Beth

Mary Beth Thelen  
Management Assistant to Director Dan Wyant  
Department of Environmental Quality  
Constitution Hall, 6th Floor South  
Phone: 517-284-6712 or 284-6700 (new numbers)  
Fax: 517-241-7401  
[Thelenm2@michigan.gov](mailto:Thelenm2@michigan.gov)

Attachments

## DEPARTMENT OF ENVIRONMENTAL QUALITY

### GOVERNOR'S OFFICE BRIEFING PAPER CITY OF FLINT DRINKING WATER

#### **What contributed to the Boil Water Advisories in the city of Flint?**

A number of factors, not one specific cause, likely contributed to the Boil Water Advisories (BWAs) in the city of Flint during August and September 2014. While use of the Flint River has increased the amount of natural organic matter in the city's water, the Flint Water Treatment Plant (WTP) has performed well above treatment requirements for organic carbon removal. In addition, less than 20 percent of the water system was included in the advisory area. If treatment had been compromised, detections would have been widespread throughout the city, rather than in such a localized area.

The city's water distribution system has suffered from a lack of infrastructure investment and asset management. Most of the city's over 550 miles of water mains are now over 75 years old and constructed of cast iron piping. Cast iron pipe is subject to internal corrosion, called tuberculation, which causes buildup on the pipe interior, leading to water quality issues, reduced flow and pressures, and leakage. Tuberculation also encourages the development of biofilms, layers of bacteria that attach to the interior pipe wall. Biofilm growth is common in areas of piping with little or no disinfectant residual, and together with tuberculation can clog water lines to the point of insufficient water pressure.

The city has also experienced decades of a declining user base and water use associated with vacant homes, commercial businesses, and industrial property. Declining water use leads to excess residence time within the city's distribution pipes and water storage facilities, accelerating tuberculation, biofilm growth, and disinfectant residual degradation. While the city has recently seen an infusion of funding for blight removal, contractors completing this work have been improperly using fire hydrants, causing hydraulic disturbances that dislodged and suspended settled debris, which may have contributed to the bacterial contamination.

The winter of 2014 was also one of the coldest experienced by the water system. The city, which historically has unaccounted water losses of over 30 percent, has seen even greater losses since February 2014 due to an increase in cold weather-related water main breaks and leaks. The city lacks a formal maintenance program for its over 7,250 valves, which would normally be used to limit impacts during break repairs. Two valves on the transmission line used to supply the area of the BWAs were found to be closed during the city's investigation, causing longer residence time, reduced disinfectant residual, reduced flow, and reduced pressure. One of these valves has remained broken.

Governor's Office Briefing Paper  
City of Flint Drinking Water  
Page 2

The BWAs also occurred during the warmest and, for 2014, relatively wet periods of August and September. Warm weather conditions are not only more conducive to bacterial growth but also degrade the water's disinfectant residual carried out from the WTP more quickly. Longer residence times, biofilms, and tuberculation also contribute to disinfectant residual degradation. Warm wet weather conditions also allow water contaminated with bacteria to pool around piping with leaks and breaks.

### **Process for Issuance and Cancellation of a Boil Water Advisory**

There are a number of conditions that can trigger BWAs. This includes the following:

- Bacteria Monitoring Detections
- Bacteria Standards Violations
- Treatment System Failures
- Waterborne Disease Outbreaks
- Loss of System Pressure
- Water Main Breaks
- Other Interruptions in Service

The Department of Environmental Quality (DEQ) has developed a policy and procedure regarding BWAs to help guide staff, provide consistency, and maintain public health. A PDF of Policy and Procedure No. ODWMA-399-022 is being forwarded with this briefing paper.

BWAs may be self-initiated by the water system, issued collaboratively in consultation with the DEQ, or when necessary mandated by the DEQ. Requesting customers to boil the water when bacterial contamination has occurred provides an added barrier of public health protection.

The BWAs that recently occurred in the city of Flint were associated with bacteria monitoring detections and violations of bacteria standards. These advisories were issued by the city of Flint collaboratively in consultation with the DEQ.

Current regulations regarding monitoring and standards for bacteria in water distribution systems were developed by the U.S. Environmental Protection Agency, have been in effect since 1990, and were incorporated into the Michigan Safe Drinking Water Act, 1976 PA 399, as amended. There are a variety of bacteria, parasites, and viruses that can potentially cause health problems if humans ingest them in drinking water. Testing water for each of these potential pathogens would be difficult and expensive. Instead, water systems test for total coliform and *E.coli*. Total coliform bacteria react to water treatment in a manner similar to many pathogens. Therefore, the presence of total coliform in drinking water indicates there may be a pathway for pathogens or other contaminants to enter the system. The absence of total coliforms in the distribution system minimizes the likelihood that pathogens are present. *E.coli* is itself a pathogen, and its detection would be direct evidence of a health risk.

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City of Flint Drinking Water  
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Once a BWA has been issued, time is needed to investigate potential causes and implement corrective measures. The larger the water system, the more time this may take. Once corrective measures have been taken, samples must be collected and analyzed to confirm that bacteria are no longer present. Using the most common analytical method, samples must be incubated for a period of 24 hours before results can be obtained. In situations where the bacterial contamination has been confirmed, two consecutive rounds of safe samples collected at least 24 hours apart are normally obtained before canceling a BWA. Adding each of these steps together, a normal response period to cancel a BWA under these circumstances would be expected to take at least 3 to 4 days.

### **Recent History of the City of Flint Water System**

Historically, the city of Flint had been a customer of the Detroit Water and Sewerage Department (DWSD) while simultaneously maintaining the Flint WTP to provide emergency backup service using the Flint River. The WTP performed quarterly test operations to maintain readiness and was utilized twice in 2009, supplying water once for 2 days and the other for 3 days.

In April 2013 the city of Flint notified the DWSD that it would be terminating service in the future and contracting for raw water service from the Karegnondi Water Authority (KWA). Work on the KWA pipeline from Lake Huron broke ground in June 2013 and is expected to be completed with connection in late 2016.

In August 2013 Rowe Professional Services Company completed an engineering proposal for improvements to the Flint WTP that would allow continuous operation of the WTP utilizing the Flint River in lieu of continuing service from the DWSD until completion of the KWA pipeline. In March 2014 the city of Flint entered into a Consent Agreement with the DEQ regarding the Flint WTP's lime sludge facility. In April 2014 the DEQ issued a construction permit for improvements to the Flint WTP. On April 25, 2014, the city of Flint began continuous operation of the WTP, using water from the Flint River and discontinued the purchase of water from the DWSD.

A BWA was issued for August 15-20, 2014, for a portion of the city of Flint due to localized detections of total coliform and *E.coli* bacteria. Another BWA was issued for September 5-9, 2014, due to localized detections of total coliform bacteria in the same and adjacent portions of the city of Flint. The advisory covered an area of approximately six square miles. The city of Flint has a total land area of just over 34 square miles.

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City of Flint Drinking Water  
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While many of the BWA contributing factors listed above require long-term solutions, the city has taken operational steps to limit the potential for a BWA to reoccur. The city has increased flushing of water mains to limit residence time, maintain disinfectant residual, and help remove buildup and deposits within the piping. The city is boosting chlorine disinfectant residual at locations in the distribution system as needed. The city continues to investigate water leaks and water main breaks and the status and condition of system valves.

Prepared by: Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
Department of Environmental Quality  
October 1, 2014

## DEPARTMENT OF ENVIRONMENTAL QUALITY

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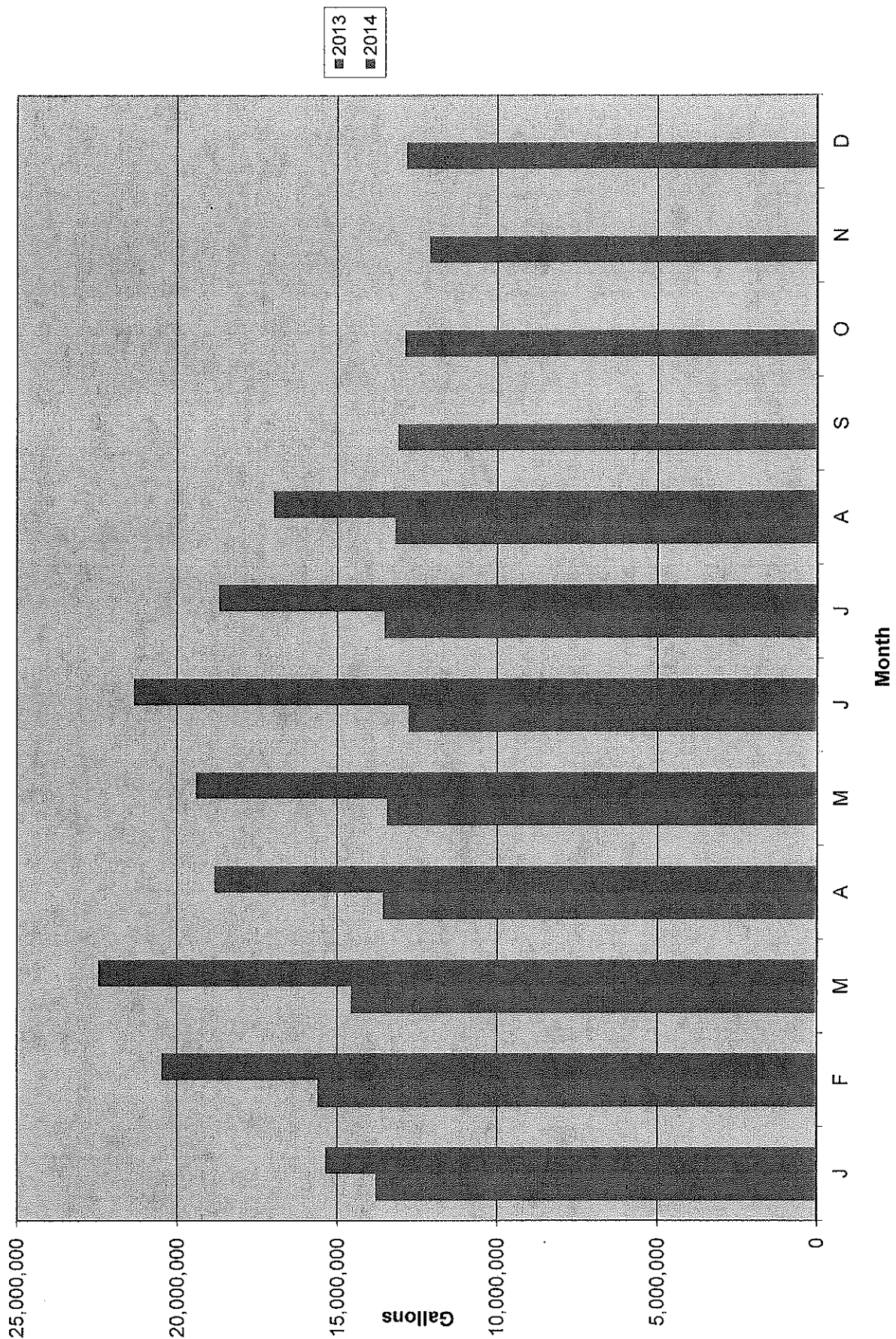


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Prepared by: Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
Department of Environmental Quality  
October 1, 2014

# City of Flint Monthly Averages



|                                                                                   |                                                                                                                                                |                         |                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>OFFICE OF DRINKING WATER<br/>AND MUNICIPAL ASSISTANCE<br/>POLICY AND PROCEDURE</b>                                                          |                         | <b>DEPARTMENT OF<br/>ENVIRONMENTAL QUALITY</b>                                                                                                                                         |
| <b>Original Effective Date:</b><br>October 12, 2007                               | <b>Subject:</b><br>Guidelines for Issuing Boil Water Advisories to<br>Address Potential Microbial Contamination of<br>Community Water Supplies |                         | <b>Category:</b><br><input type="checkbox"/> Internal/Administrative<br><input type="checkbox"/> External/Noninterpretive<br><input checked="" type="checkbox"/> External/Interpretive |
| <b>Revised Date:</b>                                                              | <b>Division/Office and Program Names:</b><br>ODWMA-Public Water System Supervision Program                                                     |                         |                                                                                                                                                                                        |
| <b>Reformatted Date:</b><br>January 24, 2013                                      | <b>Number:</b><br>ODWMA-399-022                                                                                                                | <b>Page:</b><br>1 of 10 |                                                                                                                                                                                        |

*A Department of Environmental Quality (DEQ) Policy and Procedure cannot establish regulatory requirements for parties outside of the DEQ. This document provides direction to DEQ staff regarding the implementation of rules and laws administered by the DEQ. It is merely explanatory; does not affect the rights of, or procedures and practices available to, the public; and does not have the force and effect of law.*

## INTRODUCTION, PURPOSE, OR ISSUE:

Community water systems are expected to provide customers with a continuous supply of water that meets both federal and state drinking water standards. However, there may be circumstances when the public must be notified that the water may not be safe. In these circumstances, a boil water advisory may be issued to prevent illness from known or suspected microbiological contamination. This policy is to provide guidance to Office of Drinking Water and Municipal Assistance (ODWMA) drinking water program staff on advising community water system personnel when to issue and rescind a boil water advisory, the appropriate content, and the manner and method of delivery.

## AUTHORITY:

Administrative rule R 325.10401a promulgated under the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), being Michigan Compiled Law 325.1001 *et seq.*, requires public notification for violations of maximum contaminant levels and treatment techniques plus other situations as determined by the DEQ. Each public notice is required to state what actions consumers should take during a violation, which may include a statement recommending water customers boil all water used for consumption until further notice.

In addition, R 325.11207 allows the DEQ to require the supplier of water to provide notice to customers or users that include any precautionary measures deemed necessary when an interruption in water service occurs, which could include low, zero, or negative pressure events.

Furthermore, R 325.12303 requires a supplier of water to include in their contingency planning a description of precautions or measures to be taken to protect the health of those customers or users that may be affected by an emergency. R 325.12304 also requires a supplier of water to notify the DEQ when an emergency is discovered and how the supply will notify its customers or users. While the content of this notification to customers or users may vary depending upon individual circumstances, each notification to customers or users must state what actions or precautions they should take, which may include a statement to boil all water used for consumption until further notice.

OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE  
POLICY AND PROCEDURE

Subject: Guidelines for Issuing Boil Water Advisories to  
Address Potential Microbial Contamination of  
Community Water Supplies

Number: ODWMA-399-022

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**STAKEHOLDER INVOLVEMENT:**

DEQ staff met with Municipal Utilities Directors to seek input on issues that were subsequently addressed in this policy and procedure.

**DEFINITIONS:**

"Boil Water Advisory (BWA)" – A written or verbal advisory issued by the community water system or DEQ notifying the users of the water system that the water is or may be contaminated and advising them to boil the water prior to using it for drinking or cooking.

"Community Water Supply (CWS)" – A public water supply (PWS) that provides year-round service to not fewer than 15 living units, or that regularly provides year-round service to not fewer than 25 residents. Examples include municipalities, such as cities, villages, and townships; apartment complexes; manufactured housing communities; condominiums; and nursing homes.

"Complete Loss of Pressure" – Sustained negative pressures or pressure below five psi in any portion of a distribution system. It does not include instantaneous low or negative pressure occurring from pressure surges caused by pump cycling, valve operation, or other water hammer events.

"Maximum Contaminant Level (MCL)" – The maximum permissible level of a contaminant in water that is delivered to any user of a PWS.

"Repeat Sample" – A sample that is collected and analyzed in response to a previous coliform-positive sample.

"Routine Sample" – A water sample that is collected and analyzed to meet the monitoring requirements for total coliform, as outlined in the written sampling plan.

"Tier 1 Public Notice" – A public notice required to be provided as soon as practical but not later than 24 hours after the supplier learns of a violation or situation that has significant potential to have serious adverse effects on human health as a result of short-term exposure. A Tier 1 Public Notice also requires the supplier to initiate consultation with the DEQ as soon as practical but not later than 24 hours after the supplier learns of the violation or situation. Examples of these violations or situations include:

1. A violation of the Total Coliform MCL when fecal or *E.coli* are present in the distribution system;
2. A violation of the treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit;
3. An occurrence of a waterborne disease outbreak;
4. A failure or significant interruption in key water treatment processes;
5. A disruption of the water supply or distribution system; and

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6. Other violations or situations as determined by the DEQ on a case-by-case basis. A violation or situation that requires a Tier 1 Public Notice also requires the supplier to consult with the DEQ to determine additional public notice requirements, including the timing, form, manner, frequency and content of the notice designed to reach all persons served, and any repeat notices or directions. At a minimum, one or more of the following forms of delivery must be used:
- a. Appropriate broadcast media;
  - b. Posting of the notice in conspicuous locations throughout the area served by the system;
  - c. Hand delivery of the notice to persons served by the system; or
  - d. Another delivery method approved by the DEQ.

Within 10 days of completing the Tier 1 Public Notice, the supplier shall submit to the DEQ a certification that it fully complied with the public notification requirements, including a representative copy of the type of notice distributed to persons served by the system and to the media.

"Tier 2 Public Notice" – A public notice required to be provided as soon as practical but not later than 30 days after the supplier learns of a violation or situation that has the potential to have serious adverse effects on human health. Examples of these violations or situations include:

1. All violations of MCL, maximum residual disinfectant level, and treatment technique requirements except where the DEQ determines a Tier 1 notice is required.
2. Violations of monitoring and testing procedure requirements, taking into account potential health impacts and persistence of the violation; and
3. Failure to comply with a variance or exemption.

For a Tier 2 Public Notice, the DEQ may, on a case-by-case basis, grant extensions in writing for up to three months from the date the supplier learns of the violation or situation, for reasons such as coordinating with billing cycles or if the violation or situation was quickly resolved and no longer poses any risk to the persons served. A Tier 2 Public Notice shall be repeated every three months as long as the violation or situation exists. A Tier 2 Public Notice and any repeat notices shall be in a form and issued in a manner that is reasonably calculated to reach persons served in the required time period. At a minimum, the notice shall be provided:

1. By mail or direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the supplier, and
2. By other methods reasonably calculated to reach other persons not receiving a bill, such as apartment dwellers, university students, nursing home patients and prison inmates. Other methods may include:
  - a. Publication in a local newspaper
  - b. Delivery of multiple copies to apartment complexes and manufactured housing communities
  - c. Posting in public places or on the Internet
  - d. Delivery to community organizations

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"Treatment Technique (TT)" – Minimum treatment requirement or a necessary methodology or technology that is employed by a supplier of water for the control of the chemical, physical, biological, or radiological characteristics of a PWS.

**POLICY:**

A BWA may be issued for a variety of reasons when microbial contamination is known or suspected. Total Coliform Rule (TCR) MCL violations, surface water TT violations, low or loss of pressure events, and waterborne disease outbreaks are circumstances when a BWA may be issued. Each of these situations is discussed in detail below. However, these situations are not the only times a BWA can or should be issued. Each incident must be handled on a case-by-case basis, using professional judgment to evaluate the circumstances in each situation.

Finally, there may be situations when water systems experience contamination that is not microbial, but chemical due to a chemical spill or backflow due to a cross connection. In these cases, a notice to customers could include "Do Not Use" language since boiling the water may not remove the contamination.

**Types of Incidents:**

**1. Violation of a Drinking Water Standard**

**a. TCR MCL Violations**

An acute TCR MCL violation occurs when monitoring indicates the presence of coliform organisms in both a routine and a follow-up repeat sample in the same monitoring period, and either analysis (routine or repeat) is also positive for fecal or *E.coli*. Because this MCL violation confirms the presence of a more direct connection to contamination, these violations warrant issuance of a BWA, unless there are unique circumstances.

A non-acute TCR MCL violation occurs when monitoring indicates the presence of coliform bacteria in 2 or more samples in the same monitoring period for a supplier collecting less than 40 samples per month, or in more than 5 percent of the samples for a supplier collecting 40 or more samples per month, and the criteria for an acute violation did not occur, i.e., fecal coliform or *E.coli* were NOT detected present in either a routine or repeat sample. For example, a system that collects 5 samples per week for a total of 20 per month may have 1 sample report positive for total coliform or fecal/*E.coli* during the first week, but all repeat samples report negative for coliform. If another sample in a subsequent week also reports total or fecal/*E.coli* positive, but again, all repeat samples are coliform-negative, then a non-acute TCR MCL violation has occurred because 2 or more samples reported positive for coliform, but no fecal coliform or *E.coli* were detected in both a routine and a repeat sample.

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When a non-acute violation occurs, staff should evaluate possible sources of contamination. If a source is identified that is considered likely to contribute disease causing organisms or result in water of questionable quality still being distributed, a BWA should be instituted. Examples of contaminant sources that would elevate the public health risk include, but are not limited to:

- flooding of the wells
- failure of the treatment system
- recent construction activity in the distribution system
- vermin (birds, rodents, etc.) activity in storage tanks
- system-wide or extensive pressure loss in the distribution system

Even if the source of contamination is not easily identified, a BWA may be appropriate for a non-acute TCR violation if the violation is widespread or ongoing. A BWA shall be instituted if monitoring indicates *E. coli* or fecal coliform contamination unless unusual circumstances warrant consideration, such as the absence of any coliform in repeat samples, or when staff are assured that the contamination has been eliminated before confirmation results are available.

However, not every TCR MCL violation must result in a BWA. There may be a few exceptions when there is a TCR MCL violation but a BWA is not needed. For example, a violation may be declared in situations where samples collected on different days from widely dispersed locations report coliform present even though repeat samples do not show positive results. In this case, the sampling results may constitute a MCL violation, but a BWA may not be necessary.

If a BWA is deemed necessary by the ODWMA, it should be issued as soon as possible but no later than 24 hours after the system learns of the violation. Because violation of an MCL results in required public notification (PN) per the PN Rule, the water supply may issue the PN and BWA simultaneously in one document (highly recommended) and must meet all the requirements of a Tier 1 PN and include BWA language.

After measures have been taken to eliminate the source(s) of contamination, such as initiating or increasing chlorine feed rates and system flushing, additional sampling must be conducted. Raw water bacteriological sampling is also encouraged to eliminate the raw water as the possible source of contamination. For MCL violations, the BWA can be rescinded after the analyses of two sets of samples collected 24 hours apart report the absence of coliform bacteria. The number of samples in each set should be a minimum of five samples, but can be decreased or increased based on system size or the extent of the affected area. Systems are encouraged to use routine sample sites if available and to use extra care if routine sites are not available.

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**b. Surface Water Treatment Rule (SWTR) TT Violations**

SWTR TT violations include:

- exceedance of turbidity standards at filter confluence point
- failure to meet disinfection contact time requirements (C\*T)
- failure to meet disinfection residual standards

Upon determination of an SWTR TT violation, ODWMA staff must determine if the violation poses a threat to public health. For example, if the turbidity levels at the filter confluence point were found to have exceeded 0.3 nephelometric turbidity units (NTUs) in 95 percent of the samples in a two-month period, an SWTR TT violation has occurred. Based upon a review of plant performance and consultation with program managers, staff may determine that no significant health risk was posed and no BWA is necessary. However, the water supply must still issue a Tier 2 PN within 30 days of the violation. On the other hand, a BWA is likely to be necessary for a treatment plant that gets overwhelmed by excessive runoff and reports a turbidity level in excess of 1.0 NTU at the filter confluence point for a four-hour period.

If the TT violation is ongoing or prolonged, or the ODWMA determines a significant public health risk is posed, ODWMA staff may elevate the PN to Tier 1 status, which must be issued within 24 hours and include BWA language. After appropriate measures have been taken to reduce or eliminate any health risk, additional monitoring must be conducted. Appropriate measures may include increasing coagulant dose, increasing chlorine residuals through the treatment plant, backwashing filters more often and flushing key system components. In this case, a BWA can be rescinded after analyses of two sets of samples collected 24 hours apart report the absence of coliform bacteria. The number of samples in each set should be a minimum of five samples, but can be decreased or increased based on type and severity of the TT violation.

Surface water plants utilizing conventional or direct filtration must add a primary coagulant under R 325.11008. Failure to add a primary coagulant is a violation of Act 399, and may also contribute to a TT violation under R 325.10611 (Filtration and Disinfection) which requires 3-log inactivation of giardia and 4-log inactivation of viruses. In these cases, ODWMA staff will have to determine if the violation poses a threat to public health and whether other actions are necessary, such as requiring a BWA. Factors to consider if a BWA is necessary would include chlorine residual concentrations throughout the treatment plant, raw water quality, C\*T compliance, plus individual filter effluent and combined filter effluent turbidity levels.

**2. Waterborne Disease Outbreaks**

Waterborne disease outbreaks can be declared by the Centers for Disease Control and Prevention, the Department of Community Health, a local health department, or other public



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health institutions. If an outbreak is declared, the ODWMA will work with the declaring agency to ensure affected community public water supplies take appropriate measures to mitigate public exposure. These measures will include appropriate public notification, including instructions to boil water if appropriate. The ODWMA will allow the water supply to rescind the notification when the agency declaring the outbreak indicates it is safe to do so as the result of additional monitoring.

### 3. Interruptions in Service

#### a. Negative or Complete Loss of Pressure

A complete loss of pressure or negative pressure in the distribution system must result in a BWA being issued to all water customers in the impacted area. After pressure is restored and the system recovers (tanks are filling and enough sources are operating to ensure pressures do not drop again), the affected area should be thoroughly flushed and coliform samples must be taken throughout the area to determine if the distribution system remains free of coliform contamination. The number of samples will vary depending on the size of the system and the extent of the area impacted. For very small systems that experience a power failure that results in a complete loss of pressure throughout the distribution system, a minimum of three samples should be collected. If applicable, chlorine residual measurements should be taken to ensure that an adequate disinfectant residual is present. If possible, chlorine dosages and residuals should be increased by 1 to 2 parts per million during this period as a corrective and preventive measure. If the first round of sampling does not detect coliform bacteria, the advisory may be rescinded. However, if the first round of sampling detects coliform bacteria, additional flushing should be conducted in the area where the positive coliform samples were collected and a second round of coliform samples collected from the area. The BWA should remain in effect until safe coliform sample results are obtained.

#### b. Low Pressure Events

Low pressure events might not result in a BWA. Low pressure is considered a drop in pressure below 20 psi but greater than 5 psi. A drop in water pressure in a distribution system could allow contamination to enter the water system through backflow by backpressure or backsiphonage. The decision to issue a BWA should be made on a case-by-case basis and be based upon professional judgment of all available data that may indicate the extent of the problem, such as:

- Geographical extent of the pressure loss
- Nature of the service area (residential vs. commercial/industrial)
- Duration of the low pressure condition
- Disinfection practices of the water system
- Relative elevation differences in the service area
- Status of the local cross connection control program

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- Age and condition of the underground piping
- Amount of underground piping located in areas of a high groundwater table
- Ability and willingness of the operators to rapidly apply chlorine to the system or distribute an increased chlorine residual throughout the affected area

After normal pressure is restored, the impacted area should be thoroughly flushed and coliform samples taken throughout the area to determine if the distribution system is free of any bacteriological contamination. The collection of coliform samples after low pressure events is not absolutely required, but may be recommended based on the factors above.

**c. Water Main Breaks or Repairs**

A BWA may be issued during water main breaks and after the break has been repaired. Whether or not to issue a BWA will depend on the location and severity of the break and, more importantly, a decision based on sound engineering judgment that the integrity of the water system has been maintained. If at all possible, repairs should be performed under reduced or low pressure by closing the closest valves on each side of the break just enough to reduce the flow so the repairs can be made under pressure while the water flowing from the break is diverted away from the excavation to maintain clean sanitary conditions. If the water main can be repaired under pressure, and no nonpotable water, soil, or other potential contaminants entered the main during the break and repair process, then a BWA is not necessary. If the water main that was removed from service is flushed, disinfected, and sampled in accordance with AWWA Standard C651 before being placed back into service, a BWA does not need to be issued.

If a water main break results in a complete loss of pressure before, during, or after the repair is made, a BWA must be issued to all customers in the affected area. The BWA should remain in effect until the area is flushed, chlorine residuals are reestablished (if applicable), and sample results do not detect coliform bacteria.

**Content and Delivery of a BWA**

If the ODWMA determines a BWA is necessary, the water supply must issue the advisory as soon as practical, but not later than 24 hours after being advised to do so. The supply must make a good faith attempt to notify all customers in the affected area. Appropriate methods of distribution are situation specific, but may include radio or television broadcasts, hand delivery, and/or posting in conspicuous locations throughout the area. Delivery requirements as detailed in the PN Rule should be used to determine appropriate delivery methods.

Although there are content requirements for public notification under the PN Rule, there are no requirements specific to boil water language. To ensure all appropriate information is transmitted to the customers, a BWA should include the same content elements as required for

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public notification under the PN Rule. If a BWA is issued as the result of an MCL violation and the water supply issues the BWA in conjunction with the required PN (highly recommended), the content **MUST** meet all PN Rule content, delivery, and reporting requirements.

The ODWMA boil water language is consistent with the U.S. Environmental Protection Agency policy that requires water be brought to a boil and allowed to boil for one minute before use. The language also suggests the use of bottled water as an alternative to boiling and describes the circumstances under which boiled or bottled water should be used.

Staff should notify the appropriate local health department and the Department of Agriculture and Rural Development, Food and Dairy Division, whenever a BWA is issued or rescinded. These agencies may receive calls from concerned customers or be involved in oversight of facilities impacted by the boil advisory and, therefore, need to be aware of the situation.

Several BWA templates have been created and are available to ODWMA staff on the DEQ Intranet. To ensure consistency and inclusion of all necessary content, these templates should be used as the basis for PNs and/or a BWA. Available templates include, but are not limited to:

- Advisory for a TCR MCL.
- Advisory for a low/no pressure event.
- Notification for cancellation of a BWA.

**PROCEDURES:**

| <b>WHO</b>           | <b>DOES WHAT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Public Water Supply  | Notify DEQ of results in a timely manner as required by law and follow through with appropriate actions.                                                                                                                                                                                                                                                                                                                                                                                  |
| District Staff       | Respond to all TCR and TT violations plus complete loss of pressure events in a timely manner and determine whether a BWA needs to be issued. <ul style="list-style-type: none"> <li>• If needed, assist supply in drafting BWA and determining most appropriate method of delivery with approval from the District Supervisor.</li> <li>• If needed, assist the supply in determining actions to remove the possible contamination including steps needed to rescind the BWA.</li> </ul> |
| District Staff       | Provide <u>on-site</u> technical assistance for acute TCR MCL violations and other boil water situations as appropriate.                                                                                                                                                                                                                                                                                                                                                                  |
| District Supervisors | Assist District Staff in the all matters pertaining to issuing a BWA.                                                                                                                                                                                                                                                                                                                                                                                                                     |

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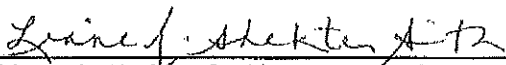
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**REFERENCES:**

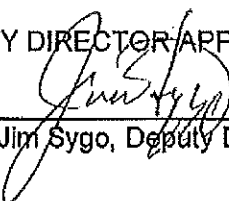
Safe Drinking Water Act, 1976 PA 399, as amended, being Michigan Compiled Law 325.1001 *et seq.*, and the administrative rules promulgated thereunder, being R 325.10101 *et seq.* of the Michigan Administrative Code.

**OFFICE CHIEF APPROVAL:**

  
\_\_\_\_\_  
Liane J. Shekter Smith, P.E., Chief  
Office of Drinking Water and Municipal Assistance

1/18/2013  
\_\_\_\_\_  
Date

**DEPUTY DIRECTOR APPROVAL:**

  
\_\_\_\_\_  
Jim Sygo, Deputy Director

1/24/2013  
\_\_\_\_\_  
Date

**Rennaker, Joanne (DEQ)**

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, October 27, 2014 4:25 PM  
**To:** prysbym@michigan.gov  
**Subject:** FW: County: genesee county-Media: Lime Sludge-Ticket #:1-31958468  
  
**Importance:** High

Please get with RRD/WRD on this.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Barger, Kristin (DEQ)  
**Sent:** Monday, October 27, 2014 4:24 PM  
**To:** DEQ-OEA-Compliance-Assistance; DEQ-PEAS-Lansing  
**Subject:** County: genesee county-Media: Lime Sludge-Ticket #:1-31958468  
**Importance:** High

| <b>PEAS Form</b>                                                                                                                                                |                            | <b>revised July 23,</b>                  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------|--|
| <b>2014</b>                                                                                                                                                     |                            |                                          |  |
| <b>First Response please "Reply All" to receipt of this PEAS Notification ASAP.</b>                                                                             |                            |                                          |  |
| <b>Incident Description: Has a sludge line that broke over the weekend. It has spilled Lime Sludge on the ground. They are in the process of cleaning it up</b> |                            |                                          |  |
| <b>Complainant (C)</b>                                                                                                                                          |                            | <b>Party Involved (PI)<br/>– Company</b> |  |
| <b>Name</b>                                                                                                                                                     | Brent Wright-City of Flint | <b>Person Name</b>                       |  |
| <b>Street Address</b>                                                                                                                                           |                            | <b>Company Name</b>                      |  |
| <b>City or Township</b>                                                                                                                                         |                            | <b>Street Address</b>                    |  |
| <b>State</b>                                                                                                                                                    |                            | <b>City or Township</b>                  |  |
| <b>Phone</b>                                                                                                                                                    | 810-787-6537, 3510         | <b>State</b>                             |  |
| <b>Alt Phone</b>                                                                                                                                                |                            | <b>Phone</b>                             |  |

|                                |                                              |                                           |             |
|--------------------------------|----------------------------------------------|-------------------------------------------|-------------|
| Type                           |                                              | Alternate Phone                           |             |
| <b>Incident Street Address</b> |                                              |                                           |             |
| Cross Streets                  | South of Carpenter Road along the Bike Trail | <b>Name of Pollutant</b>                  | Lime Sludge |
| City or Township               |                                              | Release to <b>Water</b> (g)               |             |
| County                         | genesee county                               | Release to <b>Ground</b> (g)              | Unknow      |
| <b>Water Body Impacted</b>     |                                              | Release to <b>Air</b> (lbs)               |             |
| Occurred:<br>Date/Time/Ongoing | Over the weekend                             | <b>Cleanup Contractor</b>                 |             |
| Release Secured: Y or N        | Yes                                          | <b>Cleanup Contractor on site: Y or N</b> |             |
| <b>Comments:</b>               |                                              |                                           |             |

*Kristin Barger*

Office of Environmental Assistance

Dept. of Environmental Quality

PO Box 30457

Lansing, MI 48909

800-662-9278 or 517-284-6853

(<https://www.surveymonkey.com/s/oeacs>)

**Rennaker, Joanne (DEQ)**

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**From:** Rosenthal, Adam (DEQ)  
**Sent:** Monday, May 19, 2014 11:14 AM  
**To:** Prysby, Mike (DEQ); Busch, Stephen (DEQ)  
**Subject:** FW: DBP locations

Flint DBP

**From:** Michael Glasgow [<mailto:mglasgow@cityofflint.com>]  
**Sent:** Monday, May 19, 2014 10:00 AM  
**To:** Rosenthal, Adam (DEQ)  
**Subject:** Re: DBP locations

Adam,

We did find an additional 4 sites for TTHM & HAA5 monitoring. I went back and looked at the data used to determine our sites for Stage 2 DBP implementation. We will be using the available sites that had the highest levels of TTHM & HAA5.

Mike Glasgow  
 City of Flint Water Plant

On Mon, May 19, 2014 at 8:46 AM, Rosenthal, Adam (DEQ) <[ROSENTHALA@michigan.gov](mailto:ROSENTHALA@michigan.gov)> wrote:

Morning Mike, we wanted to make sure you found an additional 4 sites (8 total) for TTHM & HAA5 monitoring that is due by the end of May. Let me know.

thanks,

Adam Rosenthal, EQA

MDEQ – Office of Drinking Water and Municipal Assistance

Lansing District – Constitution Hall 1SW

PO Box 30242

Lansing, MI 48909

517-284-6644

fax: 517-241-3571





**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, February 27, 2015 3:00 PM  
**To:** Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** FW: DEQ-Laboratory Report-50201563  
**Attachments:** 50201563-03.PDF; DBP results & other investigation.xlsx

Can you check this out? Is it just the address site code issue?

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Hansen, Jeff [<mailto:jrhansen@lan-inc.com>]  
**Sent:** Friday, February 27, 2015 2:34 PM  
**To:** Busch, Stephen (DEQ)  
**Cc:** Prysby, Mike (DEQ)  
**Subject:** FW: DEQ-Laboratory Report-50201563

Steve,

Thanks for the table. Flint passed the info on to me earlier today.

I see a discrepancy between your table and Flint's records and we have used Flint's data in the report. I have double checked the lab results and I believe the error is on your end, but that is something to resolve. I've attached what I believe is correct. We have already printed and sent out the report since it is due to you guys Sunday. Samir is hand delivering and will probably be by soon.

**Jeffrey R. Hansen**  
 Senior Project Manager



1311 South Linden Road, Suite B • Flint, MI 48532  
 T 810.820.2682 C 810.333.3201  
[www.lan-inc.com](http://www.lan-inc.com) • [JRHansen@lan-inc.com](mailto:JRHansen@lan-inc.com)

**From:** Brent Wright [<mailto:bwright@cityofflint.com>]  
**Sent:** Friday, February 27, 2015 9:43 AM  
**To:** Hansen, Jeff  
**Subject:** Fwd: DEQ-Laboratory Report-50201563

----- Forwarded message -----

From: **Michael Glasgow** <[mglasgow@cityofflint.com](mailto:mglasgow@cityofflint.com)>  
 Date: Fri, Feb 27, 2015 at 8:09 AM  
 Subject: Fwd: DEQ-Laboratory Report-50201563  
 To: Brent Wright <[bwright@cityofflint.com](mailto:bwright@cityofflint.com)>

Here are the DBP results. Everything is great, but this still leaves us in violation at 3 sites, as shown in the other attachment.

----- Forwarded message -----

From: **DEQ-DWR-LABREPORTS** <[DEQ-DWR-LABREPORTS2@michigan.gov](mailto:DEQ-DWR-LABREPORTS2@michigan.gov)>

Date: Thu, Feb 26, 2015 at 4:43 PM

Subject: DEQ-Laboratory Report-50201563

To: "[MGLASGOW@CITYOFFLINT.COM](mailto:MGLASGOW@CITYOFFLINT.COM)" <[MGLASGOW@cityofflint.com](mailto:MGLASGOW@cityofflint.com)>

Dear Drinking Water Laboratory Client,

A PDF file containing your analytical results has been attached to this e-mail.

Please do not reply directly to this e-mail. It is an automated account that does not respond to incoming messages.

Please contact the laboratory directly at (517) 335-8184 with questions regarding your report.

Thank you for using the MDEQ Drinking Water Laboratory.

--

**Brent Wright**  
**Water Plant Supervisor**  
**City of Flint**  
**4500 N. Dort Hwy.**  
**Flint, MI. 48505**  
**Ph: 810.787.6537 ext. 3510**  
**Fx: 810.787.3710**

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003



P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562

**Sample Number**  
**LF54936**

**Official Laboratory Report**

Report To: MIKE GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT                      | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 2501 FLUSHING RD, FLINT            | Source:         | TYPE I                       |
| Collected By:           | KEVIN MCLEOD                       | Site Code:      | DBP #5                       |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 02/17/2015 11:50             |
| Sample Point:           | KITCHEN SINK                       | Date Received:  | 02/19/2015 11:12             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                 |           |
|-------------------------------|---------------|-------------|------------------------|---------------|-----------------|-----------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |               |             |                        |               |                 |           |
| Bromoacetic acid              | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | 0.003         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected  | 02/24/2015  | 0.002                  |               | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected  | 02/24/2015  | 0.001                  | 0.2           | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | 0.005         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.009         | 02/24/2015  | NA                     | 0.060         | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |               |             |                        |               |                 |           |
| Bromodichloromethane          | 0.0084        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0023        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0078        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0060        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0245        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | TTHM-00-C |

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562

**Sample Number**

**LF54936**



| TESTING INFORMATION |                  |                | REGULATORY INFORMATION |                  |        |       |
|---------------------|------------------|----------------|------------------------|------------------|--------|-------|
| Analyte Name        | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method | CAS # |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003  
P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562



**Sample Number**  
**LF54937**

**Official Laboratory Report**

Report To: MIKE GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT                      | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 3606 CORUNNA RD, FLINT             | Source:         | TYPE I                       |
| Collected By:           | KEVIN MCLEOD                       | Site Code:      | DBP 4                        |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 02/17/2015 11:35             |
| Sample Point:           | BATHROOM                           | Date Received:  | 02/19/2015 11:12             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                 |           |
|-------------------------------|---------------|-------------|------------------------|---------------|-----------------|-----------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |               |             |                        |               |                 |           |
| Bromoacetic acid              | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | 0.003         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected  | 02/24/2015  | 0.002                  |               | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected  | 02/24/2015  | 0.001                  | 0.2           | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | 0.005         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.009         | 02/24/2015  | NA                     | 0.060         | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |               |             |                        |               |                 |           |
| Bromodichloromethane          | 0.0062        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0017        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0058        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0044        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0181        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | TTHM-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number**

**LF54938**

**Official Laboratory Report**

Report To: MIKE GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

System Name/Owner: CITY OF FLINT  
Collection Address: 3216 MLK BLVD, FLINT  
Collected By: KEVIN MCLEOD  
Township/Well#/Section: //  
County: Genesee  
Sample Point: BATHROOM  
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310  
Source: TYPE I  
Site Code: DBP 6  
Collector: Public Water Supply Operator  
Date Collected: 02/17/2015 12:15  
Date Received: 02/19/2015 11:12  
Purpose: Routine Monitoring

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                 |           |
|-------------------------------|---------------|-------------|------------------------|---------------|-----------------|-----------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |               |             |                        |               |                 |           |
| Bromoacetic acid              | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected  | 02/24/2015  | 0.002                  |               | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected  | 02/24/2015  | 0.001                  | 0.2           | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.002         | 02/24/2015  | NA                     | 0.060         | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |               |             |                        |               |                 |           |
| Bromodichloromethane          | 0.0093        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0026        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0075        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0091        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0285        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | TTHM-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

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**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number**

**LF54939**

**Official Laboratory Report**

Report To: MIKE GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT                      | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 822 S DORT HWY, FLINT              | Source:         | TYPE I                       |
| Collected By:           | KEVIN MCLEOD                       | Site Code:      | DBP 2                        |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 02/17/2015 10:55             |
| Sample Point:           | BATHROOM                           | Date Received:  | 02/19/2015 11:12             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                 |           |
|-------------------------------|---------------|-------------|------------------------|---------------|-----------------|-----------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |               |             |                        |               |                 |           |
| Bromoacetic acid              | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | 0.003         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected  | 02/24/2015  | 0.002                  |               | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected  | 02/24/2015  | 0.001                  | 0.2           | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | 0.005         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.009         | 02/24/2015  | NA                     | 0.060         | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |               |             |                        |               |                 |           |
| Bromodichloromethane          | 0.0066        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0020        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0065        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0048        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0199        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | TTHM-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U. S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number**  
**LF54940**

**Official Laboratory Report**

Report To: **MIKE GLASGOW**  
**4500 N DORT HWY**  
**FLINT MI 48505**

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT                      | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 3719 DAVISON RD, FLINT             | Source:         | TYPE I                       |
| Collected By:           | KEVIN MCLEOD                       | Site Code:      | DBP 1                        |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 02/17/2015 10:39             |
| Sample Point:           | KITCHEN                            | Date Received:  | 02/19/2015 11:12             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                 |           |
|-------------------------------|---------------|-------------|------------------------|---------------|-----------------|-----------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |               |             |                        |               |                 |           |
| Bromoacetic acid              | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | 0.003         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected  | 02/24/2015  | 0.002                  |               | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected  | 02/24/2015  | 0.001                  | 0.2           | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | 0.005         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.009         | 02/24/2015  | NA                     | 0.060         | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |               |             |                        |               |                 |           |
| Bromodichloromethane          | 0.0057        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0015        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0054        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0036        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0162        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | TTHM-00-C |

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**Genesee County Health Dept.**  
**630 South Saginaw**  
**Flint, MI 48502-1540**  
**810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number**  
**LF54941**

**Official Laboratory Report**

Report To: MIKE GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT                      | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 5018 CLIO RD, FLINT                | Source:         | TYPE I                       |
| Collected By:           | KEVIN MCLEOD                       | Site Code:      | DBP 7                        |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 02/17/2015 12:34             |
| Sample Point:           | BATHROOM SINK                      | Date Received:  | 02/19/2015 11:12             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                 |           |
|-------------------------------|---------------|-------------|------------------------|---------------|-----------------|-----------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |               |             |                        |               |                 |           |
| Bromoacetic acid              | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | 0.003         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected  | 02/24/2015  | 0.002                  |               | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected  | 02/24/2015  | 0.001                  | 0.2           | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | 0.005         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.009         | 02/24/2015  | NA                     | 0.060         | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |               |             |                        |               |                 |           |
| Bromodichloromethane          | 0.0066        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0018        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0060        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0048        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0192        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | TTHM-00-C |

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**Genesee County Health Dept.**  
**630 South Saginaw**  
**Flint, MI 48502-1540**  
**810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
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CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003

P.O. Box 30270

Lansing, MI 48909

TEL: (517) 335-8184

FAX: (517) 335-8562



**Sample Number**

**LF54942**

**Official Laboratory Report**

Report To: MIKE GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

System Name/Owner: CITY OF FLINT  
Collection Address: 6204 N SAGINAW ST, FLINT  
Collected By: KEVIN MCLEOD  
Township/Well#/Section: //  
County: Genesee  
Sample Point: BATHROOM SINK  
Water System: Treated Public Distribution System

WSSN/Pool ID: 2310  
Source: TYPE I  
Site Code: DBP 8  
Collector: Public Water Supply Operator  
Date Collected: 02/17/2015 12:51  
Date Received: 02/19/2015 11:12  
Purpose: Routine Monitoring

| TESTING INFORMATION           |                  |                | REGULATORY INFORMATION |                  |                 |           |
|-------------------------------|------------------|----------------|------------------------|------------------|-----------------|-----------|
| Analyte Name                  | Result<br>(mg/L) | Date<br>Tested | RL<br>(mg/L)           | MCL/AL<br>(mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |                  |                |                        |                  |                 |           |
| Bromoacetic acid              | Not Detected     | 02/24/2015     | 0.001                  |                  | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | 0.003            | 02/24/2015     | 0.001                  |                  | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected     | 02/24/2015     | 0.002                  |                  | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected     | 02/24/2015     | 0.001                  | 0.2              | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | 0.002            | 02/24/2015     | 0.001                  |                  | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | 0.005            | 02/24/2015     | 0.001                  |                  | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.009            | 02/24/2015     | NA                     | 0.060            | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002            | 02/24/2015     | 0.001                  |                  | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |                  |                |                        |                  |                 |           |
| Bromodichloromethane          | 0.0049           | 02/20/2015     | 0.0005                 | 0.080            | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0014           | 02/20/2015     | 0.0005                 | 0.080            | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0048           | 02/20/2015     | 0.0005                 | 0.080            | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0038           | 02/20/2015     | 0.0005                 | 0.080            | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0149           | 02/20/2015     | 0.0005                 | 0.080            | EPA 524.2       | TTHM-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.  
630 South Saginaw  
Flint, MI 48502-1540  
810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
DRINKING WATER LABORATORY**

USEPA Region V Drinking Water Cert. No. MI00003  
P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-8184  
FAX: (517) 335-8562



**Sample Number**  
**LF54943**

**Official Laboratory Report**

Report To: MIKE GLASGOW  
4500 N DORT HWY  
FLINT MI 48505

|                         |                                    |                 |                              |
|-------------------------|------------------------------------|-----------------|------------------------------|
| System Name/Owner:      | CITY OF FLINT                      | WSSN/Pool ID:   | 2310                         |
| Collection Address:     | 3202 S DORT HWY, FLINT             | Source:         | TYPE I                       |
| Collected By:           | KEVIN MCLEOD                       | Site Code:      | DBP 3                        |
| Township/Well#/Section: | //                                 | Collector:      | Public Water Supply Operator |
| County:                 | Genesee                            | Date Collected: | 02/17/2015 11:12             |
| Sample Point:           | KITCHEN                            | Date Received:  | 02/19/2015 11:12             |
| Water System:           | Treated Public Distribution System | Purpose:        | Routine Monitoring           |

| TESTING INFORMATION           |               |             | REGULATORY INFORMATION |               |                 |           |
|-------------------------------|---------------|-------------|------------------------|---------------|-----------------|-----------|
| Analyte Name                  | Result (mg/L) | Date Tested | RL (mg/L)              | MCL/AL (mg/L) | Method          | CAS #     |
| <b>Dalapon and Haloacetic</b> |               |             |                        |               |                 |           |
| Bromoacetic acid              | Not Detected  | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-08-3   |
| Bromochloroacetic acid        | 0.003         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 5589-96-3 |
| Chloroacetic acid             | Not Detected  | 02/24/2015  | 0.002                  |               | EPA 552.1/552.2 | 79-11-8   |
| Dalapon                       | Not Detected  | 02/24/2015  | 0.001                  | 0.2           | EPA 552.1/552.2 | 75-99-0   |
| Dibromoacetic acid            | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 631-64-1  |
| Dichloroacetic acid           | 0.005         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 79-43-6   |
| Total Haloacetic Acids (five) | 0.009         | 02/24/2015  | NA                     | 0.060         | EPA 552.1/552.2 | THA-00-C  |
| Trichloroacetic acid          | 0.002         | 02/24/2015  | 0.001                  |               | EPA 552.1/552.2 | 76-03-9   |
| <b>Total Trihalomethanes</b>  |               |             |                        |               |                 |           |
| Bromodichloromethane          | 0.0056        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-27-4   |
| Bromoform                     | 0.0017        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 75-25-2   |
| Chlorodibromomethane          | 0.0055        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 124-48-1  |
| Chloroform                    | 0.0040        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | 67-66-3   |
| Total Trihalomethanes         | 0.0168        | 02/20/2015  | 0.0005                 | 0.080         | EPA 524.2       | TTHM-00-C |

The analyses performed by the MDEQ Drinking Water Laboratory were conducted using methods approved by the U.S. Environmental Protection Agency in accordance with the Safe Drinking Water Act, 40 CFR parts 141-143, and other regulatory agencies as appropriate.

**Your local health department has detailed information about the quality of drinking water in your area. If you have concerns about the health risks related to the test results of your sample, please contact the Environmental Health Section through the address and telephone number listed below:**

**Genesee County Health Dept.**  
**630 South Saginaw**  
**Flint, MI 48502-1540**  
**810 257-3603**

CAS# : Chemical Abstract Service Registry Number  
MCL : Maximum Contaminant Level  
AL : Action Level  
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)  
ppm : parts per million  
MPN : Most Probable Number  
CFU : Colony Forming Unit

Laboratory Contacts  
Drinking Water Unit Mgr: Julia Pieper  
Systems Mgmt. Unit Mgr: George Krisztian

## DISINFECTION BY-PRODUCTS - DEQ Required Testing

MCL for TTHM = 80 ug/L MCL for HAA5 = 60 ug/L

|                 | May-14                   |      | Aug-14                   |      | Nov-14                   |      | Feb-15                   |      | LRAA                     |      | MAX<br>TTHM | MIN<br>TTHM |
|-----------------|--------------------------|------|--------------------------|------|--------------------------|------|--------------------------|------|--------------------------|------|-------------|-------------|
|                 | TTHM                     | HAA5 | TTHM                     | HAA5 | TTHM                     | HAA5 | TTHM                     | HAA5 | TTHM                     | HAA5 |             |             |
| Water Plant Tap | 56                       | 36   | 86                       | 36   | 33                       | 36   |                          | 36   | 58.3                     | 36.0 | 86.0        | 33.0        |
|                 | *Once Yearly (June 2014) |      | *Once Yearly (June 2014) |      | *Once Yearly (June 2014) |      | *Once Yearly (June 2014) |      | *Once Yearly (June 2014) |      |             |             |
| Site # 1        | 162.4                    | 64.0 | 145.3                    | 43.0 | 58.6                     | 16.0 | 16.2                     | 9.0  | 95.6                     | 33.0 | 162.4       | 16.2        |
| Site # 2        | 111.6                    | 52.0 | 112.0                    | 40.0 | 36.2                     | 21.0 | 19.9                     | 9.0  | 69.9                     | 30.5 | 112.0       | 19.9        |
| Site # 3        | 96.5                     | 48.0 | 127.2                    | 31.0 | 33.3                     | 15.0 | 16.8                     | 9.0  | 68.5                     | 25.8 | 127.2       | 16.8        |
| Site # 4        | 106.4                    | 55.0 | 181.3                    | 24.0 | 33.9                     | 15.0 | 18.1                     | 9.0  | 84.9                     | 25.8 | 181.3       | 18.1        |
| Site # 5        | 75.1                     | 38.0 | 196.2                    | 11.0 | 93.6                     | 24.0 | 24.5                     | 9.0  | 97.4                     | 20.5 | 196.2       | 24.5        |
| Site # 6        | 82.2                     | 41.0 | 112.4                    | 25.0 | 50.1                     | 5.0  | 28.5                     | 2.0  | 68.3                     | 18.3 | 112.4       | 28.5        |
| Site # 7        | 88.2                     | 49.0 | 144.4                    | 30.0 | 53.6                     | 17.0 | 19.2                     | 9.0  | 76.4                     | 26.3 | 144.4       | 19.2        |
| Site # 8        | 79.2                     | 50.0 | 118.3                    | 37.0 | 41.1                     | 18.0 | 14.9                     | 9.0  | 63.4                     | 28.5 | 118.3       | 14.9        |

\*Sampled at end of Oct.

## DISINFECTION BY-PRODUCTS - Other TTHM Investigations

|                        | Jul-14 | Aug-14 | Nov-14 |
|------------------------|--------|--------|--------|
|                        | TTHM   | TTHM   | TTHM   |
| Dort Reservoir         | 153.3  | n/a    | n/a    |
| Cedar Street Reservoir | n/a    | 163.3  | 35.2   |
| West Side Reservoir    | n/a    | 134.4  | 43.9   |

In house investigation using Parker TTHM Analyzer provided by United Water Affiliate

|                   | 10/16/2014 | 10/17/2014 | 10/21/2014 | 10/29/2014 |
|-------------------|------------|------------|------------|------------|
|                   | TTHM       | TTHM       | TTHM       | TTHM       |
| 3 MG Well (PS #4) | 48.8       | 49.9       | 32.2       | 34.9       |
| + 1 hour          | 54.7       | 52.8       | 39.2       | n/a        |
| + 48 hours        | n/a        | n/a        | n/a        | 116.6      |
| + 170 hours       | n/a        | n/a        | n/a        | 168.0      |

## Total Organic Carbon (mg

|        | Raw   | Final |
|--------|-------|-------|
| May    | 10.30 | 4.57  |
| June   | 9.00  | 3.63  |
| July   | 8.44  | 2.67  |
| August | 8.48  | 4.06  |
| Sept   | 7.36  | 3.30  |
| Oct    | 7.38  | 2.99  |
| Nov    | 7.27  | 3.86  |
| Dec    | 6.49  | 2.59  |
| Jan    | 7.62  | 3.21  |
| Feb    | 5.95  | 2.07  |

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, September 25, 2015 12:16 PM  
**To:** Krisztian, George (DEQ)  
**Subject:** FW: Detroit News article about lead testing

I thought I had included you, not Susan when I hit reply.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, September 25, 2015 12:11 PM  
**To:** Leeming, Susan (DEQ)  
**Cc:** Wurfel, Brad (DEQ)  
**Subject:** RE: Detroit News article about lead testing

George,

Sorry about the confusion. While we have said all along that the City of Flint has indicated that they are willing to test customer water for lead, the media doesn't appear to have carried the message through in their article. You can inform Flint customers that they can contact the Flint Water Treatment Plant at 810-787-6537.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

**From:** Leeming, Susan (DEQ)  
**Sent:** Friday, September 25, 2015 10:46 AM  
**To:** Krisztian, George (DEQ)  
**Cc:** Wagner, Robert (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Subject:** RE: Detroit News article about lead testing

I talked to Richard Benzie. He said that the City of Flint is providing free lead testing. Steve Busch or Mike Prysby might have a phone number or more info that you can pass on.

Sue Leeming, Assistant Chief  
 Remediation and Redevelopment Division  
 Department of Environmental Quality  
 517-897-2839 (cell)

517-284-5091 (desk)

**From:** Krisztian, George (DEQ)

**Sent:** Friday, September 25, 2015 10:33 AM

**To:** Wagner, Robert (DEQ) <WAGNERR1@michigan.gov>; Leeming, Susan (DEQ) <LeemingS@michigan.gov>

**Subject:** Detroit News article about lead testing

**Importance:** High

Hi Bob and Sue,

You may want to read the following article:

<http://www.detroitnews.com/story/news/local/michigan/2015/09/24/flint-plans-advisory-curbing-exposure-lead/72725736/>

The most pertinent part is:

**"State regulators insist the water is safe, although they're urging anyone with concerns to have their water tested for free."**

As you can imagine we have been getting quite a few calls about the "Free lead testing" that we provide. We have been informing callers that the article got it wrong and that we are a fee based service. People have been irritated with us but there is nothing that we can do about the situation. I just want to give you the heads up in case someone complains to their legislator about the Lab.

Please note that the article does not even mention the DEQ Lab or the Lab that is offering this "free service".

Brad is mentioned in the article and he probably should be made aware of the situation. What is the best way to do that?

George

George L. Krisztian  
Laboratory Director  
Michigan Department of Environmental Quality  
(517) 335-8812

**Rennaker, Joanne (DEQ)**

---

**From:** Benzie, Richard (DEQ)  
**Sent:** Tuesday, May 13, 2014 1:35 PM  
**To:** Busch, Stephen (DEQ)  
**Cc:** Willard, Veronica (DEQ)  
**Subject:** FW: DIR00107 McCormick / Recent developments involving DWSD's water service to city of Flint and Genesee County  
**Attachments:** ODWMA 14 DIR00107I McCormick.pdf

Please draft a response regarding the reliability of Flint's water supply. I'm not sure DWSD needs to be assured but it's the courteous thing to do and probably makes them drop this issue.

---

**From:** Willard, Veronica (DEQ)  
**Sent:** Tuesday, May 13, 2014 11:36:37 AM  
**To:** Benzie, Richard (DEQ)  
**Cc:** Shekter Smith, Liane (DEQ)  
**Subject:** FW: DIR00107 McCormick / Recent developments involving DWSD's water service to city of Flint and Genesee County

Can you forward to appropriate staff to draft a response for the Director's signature? Thank you.

---

**From:** DEQ-LogLetter  
**Sent:** Tuesday, May 13, 2014 9:49 AM  
**To:** Willard, Veronica (DEQ)  
**Cc:** Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Shaler, Karen (DEQ); Anderson, Madhu (DEQ); Patterson, Leigh (DEQ); Shekter Smith, Liane (DEQ)  
**Subject:** DIR00107 McCormick / Recent developments involving DWSD's water service to city of Flint and Genesee County

Assigned to ODWMA

# Letter Buckslip

12-May-14

|                 |                                                                                        |                                                                                                                                                                                                                                                                                   |
|-----------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID:             | DIR00107                                                                               | Deputy Director _____<br>Deputy's Mgmt. Asst. _____<br>Director's Office Staff _____<br>Division/Office Chief _____<br>Division/Office Chief's Mgmt. Asst. _____<br>Prepared by: _____<br>Division/Office _____<br>Exec. Div. File No. _____<br><input type="checkbox"/> Delogged |
| Date of letter: | 5/9/2014                                                                               |                                                                                                                                                                                                                                                                                   |
| Date received:  | 5/12/2014                                                                              |                                                                                                                                                                                                                                                                                   |
| Date due:       | 5/28/2014                                                                              |                                                                                                                                                                                                                                                                                   |
| Reply date:     |                                                                                        |                                                                                                                                                                                                                                                                                   |
| Last name:      | McCormick                                                                              |                                                                                                                                                                                                                                                                                   |
| First name:     | Sue F.                                                                                 |                                                                                                                                                                                                                                                                                   |
| Organization:   | Detroit Water and Sewerage Department                                                  |                                                                                                                                                                                                                                                                                   |
| Subject:        | Recent developments involving DWSD's water service to city of Flint and Genesee County |                                                                                                                                                                                                                                                                                   |
| Reply to:       |                                                                                        |                                                                                                                                                                                                                                                                                   |
| Author:         |                                                                                        |                                                                                                                                                                                                                                                                                   |
| Owner:          | SHALERK                                                                                |                                                                                                                                                                                                                                                                                   |

| <u>Action</u> | <u>Action Date</u> | <u>Due Date</u> | <u>Entity</u> | <u>Signature</u> | <u>Owner</u> | <u>CCs</u>                                                   |
|---------------|--------------------|-----------------|---------------|------------------|--------------|--------------------------------------------------------------|
| Assigned 1    | 5/12/2014          | 5/28/2014       | ODWM<br>A     | DIR              | SHALERK      | Thelen<br>Sygo/Shaler<br>Anderson/Patterson<br>Shekter Smith |

Comments: Assigned to ODWMA

Please prepare response for Director's signature if a response is needed.





CITY OF DETROIT  
WATER AND SEWERAGE DEPARTMENT  
OFFICE OF THE DIRECTOR

735 RANDOLPH STREET  
DETROIT, MICHIGAN 48226  
WWW.DETROITMI.GOV

DIR000107

May 9, 2014

Mr. Dan Wyant, Director  
Michigan Department of Environmental Quality  
525 West Allegan Street  
P.O. Box 30473  
Lansing, MI 48909-7973

Director Wyant:

Regarding: City of Flint

I am writing this letter to keep the Michigan Department of Environmental Quality ("MDEQ") informed of recent developments involving the Detroit Water and Sewerage Department ("DWSD") and the City of Flint. As you are already aware, DWSD gave notice to the City of Flint in April of 2013, that it was terminating the City's contract for water service with DWSD. Pursuant to that notice, there has been on-going communication and negotiation between DWSD and the City of Flint regarding DWSD's willingness to continue to provide service to both Flint and Genesee County as non-contract customers of DWSD, until such time as either or both enter into a new long-term contract with DWSD.

As of May 1, 2014, the City of Flint stopped taking water from DWSD. DWSD staff, together with staff from Genesee County, confirmed that the valves were closed and we have noted the reduction in meter flow at our FL-01 meter to confirm this information. Further, the City of Flint has verbally informed DWSD that it does not require DWSD to provide the City with any redundancy options for water service. While DWSD has requested Flint to provide confirmation from MDEQ on this point, we have yet to receive that assurance in writing.

At the present time, DWSD continues to provide water to Genesee County. We also remain in active negotiations with Genesee County on a long-term water service and back-up service contract.

Should you have any questions regarding these matters, please do not hesitate to contact me at (313) 224-4701.

Sincerely yours,

*Sue F. McCormick*  
Sue F. McCormick  
Director

cc: Leann Shekter-Smith, MDEQ

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, August 18, 2014 1:05 PM  
**To:** prysbym@michigan.gov  
**Subject:** FW: Email Inquiry - Community Drinking Water Contamination Complaint  
**Attachments:** Email Inquiry  
  
**Importance:** High

Mike could you please respond to the attached complaint. I would suggest via the phone number provided.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** deq-assist  
**Sent:** Monday, August 18, 2014 12:52 PM  
**To:** Busch, Stephen (DEQ)  
**Subject:** FW: Email Inquiry - Community Drinking Water Contamination Complaint  
**Importance:** High

Good Afternoon Stephen,  
 Please review and respond to the customer email attached, or if you determined it appropriate please forward to other staff for response.

Thank you for your assistance.

*Tonya*

Tonya Schelter, Department Analyst  
 Michigan Department of Environmental Quality  
 Office of Environmental Assistance  
 Environmental Assistance Center 1-800-662-9278  
 517-284-6873  
[Deq-assist@michigan.gov](mailto:Deq-assist@michigan.gov)  
[scheltert@michigan.gov](mailto:scheltert@michigan.gov)  
 517-284-7272 SARA Title III Program Phone  
[Deq-sara@michigan.gov](mailto:Deq-sara@michigan.gov)

Thanks for contacting our Department of Environmental Quality, Office of Environmental Assistance. To help us improve our services, we encourage you to complete our short customer service survey  
<https://www.surveymonkey.com/s/oeacs>

**Rennaker, Joanne (DEQ)**

---

**From:** BadAddress  
**Sent:** Monday, August 18, 2014 10:59 AM  
**To:** deq-assist  
**Subject:** Email Inquiry

---

**CompanyName:**

**FirstName:** Raney  
**LastName:** Russell  
**Email:** [raneyrussell@gmail.com](mailto:raneyrussell@gmail.com)  
**DayPhone:** 810-407-0513  
**AltPhone:**  
**Address:** 2405 E. Court Street  
**City:** Flint  
**State:** MI  
**ZipCode:** 48503  
**County:** Genesee

**YourMessage:** I have it on good authority that the Flint City Council members are trying to cover-up a larger drinking water contamination, than that which was originally reported. On August 12, 2014 the new Flint Water Treatment Plant discharged a large amount of sewage into the Flint River (the same river where it gets its water). On August 16, 2014 the Flint Journal reported that a small area of the city's water was contaminated and that there is a boil advisory until further notice. The water in that area was found to have E. Coli. However, several people from areas in Flint, which are not under the boil water advisory, are getting sick. Three neighbors in the College/Cultural area in Flint, MI, 48503 are violently ill, reporting flu like symptoms. A dog has died and 2 dogs are ill in the area of Simcoe Ave, Flint, MI 48507, from consuming tap water. This issue is wider than the city is reporting and it needs to be investigated immediately.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, September 17, 2015 3:50 PM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Pallone, Maggie (DEQ)  
**Subject:** FW: Flint - Hydrant Flushing Photo

FYI. From Treasury.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

---

**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Thursday, September 17, 2015 3:40 PM  
**To:** Busch, Stephen (DEQ)  
**Cc:** Benzie, Richard (DEQ)  
**Subject:** Fw: Flint - Hydrant Flushing Photo

Steve-

I just spoke with Randy with treasury. He has some questions regarding flint, and I suggested he call you. Heads up.

---

**From:** Byrne, Randall (Treasury)  
**Sent:** Thursday, September 17, 2015 11:40:16 AM  
**To:** Shekter Smith, Liane (DEQ)  
**Subject:** FW: Flint - Hydrant Flushing Photo

Liane:

I tried calling you yesterday and I understand that you plan to return to the office tomorrow. Please call me to discuss this photo taken in Flint.

Thanks,  
 Randy

---

**From:** Widigan, Robert (TREASURY)  
**Sent:** Thursday, September 17, 2015 11:27 AM  
**To:** Workman, Wayne (TREASURY) <[WorkmanW@michigan.gov](mailto:WorkmanW@michigan.gov)>; Koryzno, Edward (Treasury) <[KoryznoE@michigan.gov](mailto:KoryznoE@michigan.gov)>; Byrne, Randall (Treasury) <[ByrneR1@michigan.gov](mailto:ByrneR1@michigan.gov)>; Cline, Richard (Treasury) <[cliner1@michigan.gov](mailto:cliner1@michigan.gov)>; Dempkowski, Angela (Treasury) <[DempkowskiA@michigan.gov](mailto:DempkowskiA@michigan.gov)>  
**Subject:** Flint - Hydrant Flushing Photo

All,

This photo was taken in the city of Flint, on Corunna Rd east of Ballenger Hwy.

This is allegedly after five **hours** of flushing. Just by looking at the amount of water in the grass and on the road, it has definitely been open for a while.



**Robert Widigan**  
Local Government Financial Services Division  
Michigan Department of Treasury

Sent from my iPhone

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, February 12, 2015 8:21 AM  
**To:** prysbym@michigan.gov  
**Subject:** FW: Flint ABC 12 call

**Importance:** High

Mike,

Can you respond to Brad on this.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Wurfel, Brad (DEQ)  
**Sent:** Wednesday, February 11, 2015 5:13 PM  
**To:** Busch, Stephen (DEQ)  
**Subject:** RE: Flint ABC 12 call

Interesting question.

Story is City of Flint's "franchise customers." They don't live in flint proper, but they do use flint water. Their water bill comes from Genesee County.

They apparently did not get the notice about the TTHM exceedance. The law says the city must notify its customers. Flint contends it notified the county and expected the county to notify the customers. County said it never got that notice ...

Not sure what was supposed to happen for 'franchise' customers or who was responsible for what. Are you familiar with how that was supposed to work? Important mostly going forward, as it is likely they'll be doing this show again in March...

She needs an answer sometime tomorrow morning. This story will air at their 11 a.m. show.

Thanks.

b

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, February 11, 2015 4:08 PM  
**To:** Wurfel, Brad (DEQ)  
**Subject:** Flint ABC 12 call

Brad,

Jessica from ABC 12 in Flint left me a message. Can you please call her back. No specific reference to Flint water but I assume that's what her question is about.

Her number is 248-721-1301. Thanks.

Stephen Busch, P.E.

Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, February 03, 2014 8:42 AM  
**To:** Shekter Smith, Liane (DEQ); prysbym@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Flint consent order addition

Please take a look at the note below. Keep in mind the order is being developed by OWMRP and that section 2 only covers the findings not the compliance plan. This would help to address Bray Road as the City of Flint (COF) wouldn't need it for lime sludge. Not sure what the implications would be for emergency use. Also once the order terminates this would no longer apply, so I'm not sure how big of a deal this is. Even so, I don't think it would be appropriate. Long term we all know it would be best for the City to use a better source than the river, but I don't want it to be forced by an order.

I would like to try and discuss this today if possible.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Robinson, Michael [<mailto:MRobinson@wnj.com>]  
**Sent:** Saturday, February 01, 2014 10:50 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** Flint consent order addition

Steve, bond counsel for the City of Flint has indicated that we need to add to Section 2.2 of the consent order (it will be a new Section in your redraft) the following language at the end of that Section: "After five years COF must undertake a public improvement project to receive water from KWA or some source other than the Flint River in order to continue to use it's water treatment plant."

Mike



**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, January 22, 2015 2:58 PM  
**To:** prysbym@michigan.gov  
**Subject:** FW: Flint Disinfection By-Product data  
**Attachments:** Flint 2014 DBP results.PDF

The pdf is attached.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

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**From:** Rosenthal, Adam (DEQ)  
**Sent:** Friday, January 16, 2015 1:31 PM  
**To:** [larry.f.elliott@abc12.com](mailto:larry.f.elliott@abc12.com)  
**Cc:** Prysby, Mike (DEQ); Busch, Stephen (DEQ); Wurfel, Brad (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)  
**Subject:** Flint Disinfection By-Product data

Dear Mr. Elliott at ABC 12 Flint.

Attached are results and definitions for Disinfection By-Products samples collected during 2014 for the City of Flint. The Locational Running Annual Average (LRAA) is the number used for compliance with the Maximum Contaminant Levels (MCLs).

Sincerely,

Adam Rosenthal, EQA  
MDEQ – Office of Drinking Water and Municipal Assistance  
Lansing District – Constitution Hall 1SW  
PO Box 30242  
Lansing, MI 48909  
517-284-6644  
fax: 517-241-3571

## Flint 2014 TTHM &amp; HAA5 results and Locational Running Annual Average (LRAA)

1/16/15

| TTHM Results (mg/L)                          |              |              |              |              |
|----------------------------------------------|--------------|--------------|--------------|--------------|
|                                              | 5/21/14      | 8/21/14      | 11/20/14     | LRAA         |
| DBP1 McDonalds<br>3719 Davison               | <b>0.162</b> | <b>0.145</b> | 0.059        | <b>0.092</b> |
| DBP2 Liquor Palace<br>3302 S. Dort Highway   | <b>0.112</b> | <b>0.127</b> | 0.033        | 0.068        |
| DBP3 North Flint Auto<br>6204 N. Saginaw St. | <b>0.097</b> | <b>0.118</b> | 0.041        | 0.064        |
| DBP4 University Market<br>2501 Flushing Road | <b>0.106</b> | <b>0.196</b> | <b>0.094</b> | <b>0.099</b> |
| DBP5 Taco Bell<br>3606 Corunna Road          | 0.079        | <b>0.181</b> | 0.034        | 0.074        |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road     | <b>0.088</b> | <b>0.144</b> | 0.054        | 0.072        |
| DBP7 Salem Housing<br>3216 MLK Boulevard     | <b>0.082</b> | <b>0.112</b> | 0.050        | 0.061        |
| DBP8 BP Gas Station<br>822 S. Dort Highway   | 0.075        | <b>0.112</b> | 0.036        | 0.056        |

| HAA5 Results (mg/L)                          |              |         |          |       |
|----------------------------------------------|--------------|---------|----------|-------|
|                                              | 5/21/14      | 8/21/14 | 11/20/14 | LRAA  |
| DBP1 McDonalds<br>3719 Davison               | <b>0.064</b> | 0.043   | 0.016    | 0.031 |
| DBP2 Liquor Palace<br>3302 S. Dort Highway   | 0.052        | 0.031   | 0.015    | 0.025 |
| DBP3 North Flint Auto<br>6204 N. Saginaw St. | 0.048        | 0.037   | 0.018    | 0.026 |
| DBP4 University Market<br>2501 Flushing Road | 0.055        | 0.017   | 0.024    | 0.024 |
| DBP5 Taco Bell<br>3606 Corunna Road          | 0.050        | 0.024   | 0.015    | 0.022 |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road     | 0.049        | 0.030   | 0.017    | 0.024 |
| DBP7 Salem Housing<br>3216 MLK Boulevard     | 0.041        | 0.025   | 0.005    | 0.018 |
| DBP8 BP Gas Station<br>822 S. Dort Highway   | 0.038        | 0.040   | 0.021    | 0.025 |

*Locational running annual average (LRAA):* the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

*Maximum contaminant level (MCL):* the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

The Stage 2 Disinfection By-Products Rule (DBPR) requires systems to meet an LRAA of 0.080 mg/L for TTHM and 0.060 mg/L for HAA5 at each compliance monitoring location.

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, June 09, 2015 1:39 PM  
**To:** Rennaker, Joanne (DEQ)  
**Subject:** FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

See note from Tracy below.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Devereaux, Tracy Jo (DEQ)  
**Sent:** Tuesday, June 09, 2015 1:38 PM  
**To:** Busch, Stephen (DEQ)  
**Subject:** RE: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Just an FYI - The date on page three of this PDF says March 5, 2015, and the cc's are not lined up, etc.

Thanks,

*Tracy Jo*

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, June 09, 2015 12:39 PM  
**To:** Howes, Sarah (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ)  
**Cc:** Prysby, Mike (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ); Thelen, Mary Beth (DEQ); Devereaux, Tracy Jo (DEQ)  
**Subject:** Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015

Attached is a copy of the Violation Notice and Public Notice Template being mailed to the City of Flint by the DEQ Office of Drinking Water and Municipal Assistance regarding an exceedance of the Maximum Contaminant Level (MCL) standard for Total Trihalomethanes at certain locations within the City's drinking water distribution system.

This violation notice is in response to updated monitoring completed in May 2015, which shows the locational running annual average for one of the City's eight compliance sampling locations continues to exceed MCL standard of 0.080 mg/L. It is however, important to note that all individual compliance sample results collected in both May and February were below the 0.080 mg/L levels.

You are being provided an electronic copy of this notice as exceedance of this drinking water standard is expected to generate inquiries from water system customers, news media, and the general public.

Sarah Howes or Maggie Pallone will be informing members of the Michigan legislature.

If you have any questions or would like any additional information, you may contact Michael Prysby, District Engineer, DEQ-ODWMA at 517-290-8817, or you may contact me at the number below.

Stephen Busch, P.E.

Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, December 16, 2014 10:18 AM  
**To:** Crooks, Jennifer (crooks.jennifer@epa.gov)  
**Subject:** FW: Flint Drinking Water TTHM Standard Violation  
**Attachments:** City of Flint VN - MCL TTHM 12\_16\_14.pdf

Jennifer,

Our TTHM Violation Notice to Flint is attached in case you get any calls. If you have any questions give us a call.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, December 16, 2014 10:16 AM  
**To:** Datema, Maggie (DEQ); 'Wurfel, Brad (DEQ) ([WurfelB@michigan.gov](mailto:WurfelB@michigan.gov))'  
**Cc:** prysbym@michigan.gov; Richard Benzie P.E. ([BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)); Shekter Smith, Liane (DEQ) ([SHEKTERL@michigan.gov](mailto:SHEKTERL@michigan.gov)); Adam Rosenthal ([rosenthala@michigan.gov](mailto:rosenthala@michigan.gov))  
**Subject:** Flint Drinking Water TTHM Standard Violation

Attached is a copy of the Violation Notice and Public Notice Template being mailed to the City of Flint by the DEQ Office of Drinking Water and Municipal Assistance regarding an exceedance of the Maximum Contaminant Level standard for Total Trihalomethanes at certain locations within the City's drinking water distribution system.

You are being provided an electronic copy of this notice as exceedance of this drinking water standard is expected to generate inquiries from water system customers, news media, and the general public.

Maggie Datema will be informing members of the Michigan legislature.

If you have any questions or would like any additional information, you may contact Michael Prysby, District Engineer, DEQ-ODWMA at 517-290-8817, or you may contact me at the number below.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING DISTRICT OFFICE



DAN WYANT  
DIRECTOR

December 16, 2014

Mr. Brent Wright, Operation Supervisor  
City Of Flint - DPW  
Flint Water Plant  
4500 North Dort Highway  
Flint, MI 48505

WSSN: 02310

Dear Mr. Wright:

SUBJECT: Violation Notice – Maximum Contaminant Level for Total Trihalomethanes  
Operational Evaluation – Total Trihalomethanes  
4<sup>th</sup> Quarter 2014 Monitoring Period

The Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance (ODWMA), records show that the City of Flint is in violation of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); R 325.10610, *Maximum contaminant levels (MCL) for disinfection byproducts*, of the 1979 Administrative Code.

In accordance with R.325.10610, *MCLs for disinfection byproducts*, of the 1979 Administrative Code, the MCL for disinfection byproduct total trihalomethanes (TTHM) is 0.080 milligrams per liter (mg/L) as a Locational Running Annual Average (LRAA) at each monitoring location. As listed in the table below, our records show that the City of Flint's highest TTHM locational running annual average (LRAA), based on the last three quarters, ending November 30, 2014, is 0.099 mg/l which exceeds the standard, and that two of the eight sample site locations exceed the standard of 0.080 mg/L.

Further, in accordance with R325.10719I, *Disinfection byproducts: operational evaluation levels*, of the 1979 Administrative Code, when an operational evaluation level (OEL) at a monitoring location for TTHM exceeds 0.080 mg/L, a supply shall conduct an operational evaluation and submit a written report of the evaluation to the department not later than 90 days after being notified of the analytical result that causes the supply to exceed the operational evaluation level. As listed in the table below, our records show that TTHM operational evaluation levels for the City of Flint exceed 0.080 mg/L at four of the City's eight sample site locations.

| TTHM Results (mg/L)                          |         |         |          |       |       |
|----------------------------------------------|---------|---------|----------|-------|-------|
|                                              | 5/21/14 | 8/21/14 | 11/20/14 | LRAA  | OEL   |
| DBP1 McDonalds<br>3719 Davison               | 0.162   | 0.145   | 0.059    | 0.092 | 0.106 |
| DBP2 Liquor Palace<br>3302 S. Dort Highway   | 0.112   | 0.127   | 0.033    | 0.068 | 0.076 |
| DBP3 North Flint Auto<br>6204 N. Saginaw St. | 0.097   | 0.118   | 0.041    | 0.064 | 0.074 |
| DBP4 University Market<br>2501 Flushing Road | 0.106   | 0.196   | 0.094    | 0.099 | 0.122 |
| DBP5 Taco Bell<br>3606 Corunna Road          | 0.079   | 0.181   | 0.034    | 0.074 | 0.082 |
| DBP6 Rite-Aid Pharmacy<br>5018 Clio Road     | 0.088   | 0.144   | 0.054    | 0.072 | 0.085 |
| DBP7 Salem Housing<br>3216 MLK Boulevard     | 0.082   | 0.112   | 0.050    | 0.061 | 0.074 |
| DBP8 BP Gas Station<br>822 S. Dort Highway   | 0.075   | 0.112   | 0.036    | 0.056 | 0.065 |

Our investigation consisted of a review of ODWMA files for laboratory reports received for compliance monitoring. Our investigation is considered complete. This violation began on December 1, 2014, and will continue until TTHM LRAA is below the MCL at all sample sites.

We acknowledge and appreciate the city's cooperation with our recommendation to preemptively conduct an Operational Evaluation following the City's second quarterly round of monitoring in August. That Operational Evaluation report has identified possible causes and corrective measures for the elevated TTHM levels which we encourage the City continue implementing. These modifications have likely contributed in part to the reduction in TTHM levels reported in the most recent quarter, and suggest the City may be able to achieve compliance with the TTHM standard.

Our office is continuing to review the Operational Evaluation report that was submitted on December 1, 2014, and will provide the City and their consultant comments as needed to help address this MCL violation.

Water systems that exceed the OEL must complete and submit an Operational Evaluation in accordance with Administrative Rule 719I (R325.10719I) within 90 days of being notified of the violation. **An updated Operational Evaluation report, which incorporates the most recent sample results, must now be completed and received by our office by no later than March 1, 2015.**

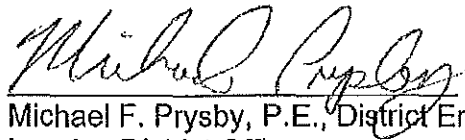
If you have any other factual information you would like us to consider regarding the violation identified in this Violation Notice (VN), please provide them in a written response by January 16, 2015.

Administrative rule R 325.10403 of Act 399 requires that suppliers provide public notice (PN) as soon as practical, but no later than thirty (30) days after the supplier learns of this type of violation, by mail or direct delivery and by any other means reasonably calculated to reach customers not normally reached by mail. Enclosed is a sample PN

which contains the minimum required language. The City is encouraged to include additional information regarding its response to this violation. **Please notify your consumers by January 10, 2015, and send us a signed and dated copy of the notice that you issued within ten (10) days of distributing the public notice.** This violation must also be included in your 2014 Consumer Confidence Report (CCR), due by July 1, 2015. The PN must be repeated every quarter until you no longer exceed the TTHM standard. Failure to issue a PN for this violation will result in a fine of at least \$1,000 per event, with a maximum of \$5,000 per violation.

We anticipate and appreciate your continued cooperation in resolving this matter. If you have any questions regarding this VN, please contact us at the numbers below.

Sincerely,



Michael F. Prysby, P.E., District Engineer  
Lansing District Office  
Office of Drinking Water & Municipal  
Assistance  
517-290-8817



Adam Rosenthal, EQA  
Lansing District Office  
Office of Drinking Water & Municipal  
Assistance  
517-284-6644

mfp/ar/jlr  
Enclosure

cc: Mr. Darnell Early, Emergency Manager, City of Flint  
Mr. Daughtry Johnson, City of Flint  
Mr. Howard Croft, City of Flint  
Mr. Robert Bincsik, City of Flint  
Ms. Jennifer Crooks, U.S. Environmental Protection Agency, Region 5  
Genesee County Health Department  
Ms. Liane Shekter Smith, P.E., DEQ  
Mr. Richard Benzie, P.E., DEQ  
Mr. Stephen Busch, P.E., DEQ



## IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

### City of Flint Did Not Meet Treatment Requirements

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Samples were collected for total trihalomethanes (TTHM) analysis from eight locations on a quarterly basis (May 21, August 21, and November 20 of 2014). The average of the results at ANY of the eight locations must not exceed the maximum contaminant level (MCL) for TTHMs, otherwise our water system exceeds the Maximum Contaminant Level (MCL). The standard for TTHMs is 80 µg/L. The location reporting the highest TTHM level was 99 µg/L; thus, our water system exceeds the TTHM MCL.

#### What should I do?

- There is nothing you need to do unless you have a severely compromised immune system, have an infant, or are elderly. These people may be at increased risk and should seek advice about drinking water from their health care providers.
- You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

#### What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

*People who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.*

#### What is being done?

We are currently working on solutions to correct the problem. We anticipate resolving the problem by 2015.

For more information, please contact Mr. Brent Wright at 517-787-6537 or the Flint Water Plant at 4500 North Dort Highway, Flint, MI 48505.

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you by the City of Flint.

#### CERTIFICATION:

WSSN: 02310

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

Signature

Title

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DEQ.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, February 03, 2015 9:34 AM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov  
**Subject:** FW: Flint event on Tuesday  
**Attachments:** 2 FDCVT Grant Awards draft.docx; ATT00001.htm; Briefing Flint grant announcement.docx; ATT00002.htm; RELEASE Flint water grants.docx; ATT00003.htm

FYI.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Wurfel, Brad (DEQ)  
**Sent:** Monday, February 02, 2015 4:35 PM  
**To:** Wyant, Dan (DEQ); Datema, Maggie (DEQ); Tommasulo, Karen (DEQ); Thelen, Mary Beth (DEQ)  
**Cc:** Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)  
**Subject:** Fwd: Flint event on Tuesday

All,

Here is some early information about the event tomorrow in Flint. State leaders, including director Wyant, Will announce \$2 million in distress community grants. Based on what little I know so far, it sounds a little bit like SAW grants.

Will share more details when I get them.

b

Sent from my iPhone

Begin forwarded message:

**From:** "Murray, David (GOV)" <MurrayD1@michigan.gov>  
**Date:** February 2, 2015 at 1:34:21 PM EST  
**To:** "Agen, Jarrod (GOV)" <AgenJ@michigan.gov>, "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov>, "Wurfel, Sara (GOV)" <Wurfels@michigan.gov>, "Wurfel, Brad (DEQ)" <WurfelB@michigan.gov>, "Biehl, Laura (GOV)" <BiehIL@michigan.gov>, "Hollins, Harvey (GOV)" <hollinsh@michigan.gov>, "Clayton, Stacie (GOV)" <claytons3@michigan.gov>, "Walsh, John (GOV)" <WalshJ@michigan.gov>, "Brownfield, Michael (GOV)" <BrownfieldM2@michigan.gov>, "Allard, Claire (GOV)" <allardc1@michigan.gov>, "Rexford, Tori (GOV)" <rexfordt@michigan.gov>  
**Subject:** Flint event on Tuesday

Good afternoon team,

Just wanted to touch base on Tuesday's event in Flint. Unless told otherwise, I'm continuing to prepare for the event.

I touched base with Harvey and Stacie, who recommended we proceed. Harvey is approaching some stakeholders about appearing at the event, and will forward those names to me later today.

I left a message with Dick Posthumus to see if he has any concerns about proceeding.

The Senate Democrats said Sen. Ananich will want to appear. Katie Carey from the House said she would forward information to Rep. Neeley and Phelps. I have not heard back from her yet.

I've attached the backgrounder and the draft releases from Governor's Communications and Treasury. I've sent a message to the mayor's office about a quote, but have not heard back yet.

Brad and I spoke about Director Wyant's role and potential comments. He will point out that there are things the state can do to help monitor the situation, but also will note that the city's water infrastructure is aging, which contributes to the problems.

We need some direction on an advisory. Should this be listed on a typical advisory from the governor's office, or come from Treasury? Do we even issue an advisory in favor of just contacting media directly in the morning?

Please give the draft releases a read for potential changes, or let me know of other concerns.

Thank you!

Dave

**Dave Murray**

Deputy Press Secretary | Executive Office of Governor Rick Snyder

[MurrayD1@michigan.gov](mailto:MurrayD1@michigan.gov)

517-335-6397, office

517-449-8343, mobile

Twitter: @michigandmurray



STATE OF MICHIGAN  
DEPARTMENT OF TREASURY  
LANSING

RICK SNYDER  
GOVERNOR

R. KEVIN CLINTON  
STATE TREASURER

February 3, 2015

**FOR IMMEDIATE RELEASE**

[www.michigan.gov/treasury](http://www.michigan.gov/treasury)

**Contact: Terry Stanton, Treasury**  
**(517) 335-2167**

**Dave Murray, Governor**  
**(517) 335-6397**

draft

***Gov. Rick Snyder announces grants helping distressed municipalities with water, public safety, appraisal issues***

*\$8 million awarded for projects aimed at improving services, quality of life*

LANSING, Mich. -- Gov. Rick Snyder today awarded \$8 million to six municipalities to fund various improvement projects, including water system and street lighting enhancements and technology upgrades through the Financially Distressed Cities, Villages, and Townships Grant Program.

Municipalities are eligible for the grants if they are experiencing one or more conditions indicative of "probable financial stress," as defined by Public Act 436 of 2012, the Local Financial Stability and Choice Act.

"Municipalities receiving this special funding are some of the areas hardest hit by the Great Recession," Snyder said. "I am pleased we can offer funding assistance to help these local governments improve various public services their taxpayers and residents expect and deserve."

Under the grant program, funding may be used to pay for specific projects, services, or strategies that move a city, village, or township toward financial stability. There was \$8 million appropriated for the program with a \$2 million cap, per local unit.

The following communities will receive funding this year, with projects and amounts noted (alphabetical order):

| Local Unit            | Project Description                                                                                                                                                        | Amount    |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| City of Benton Harbor | Complete a property reappraisal to provide updated and accurate assessing records. Additionally, community enhancement through blight management and sidewalk replacement. | \$475,000 |
| City of Benton Harbor | Water system enhancement through water main replacements and fire hydrant repairs.                                                                                         | \$434,960 |

|                       |                                                                                                                     |             |
|-----------------------|---------------------------------------------------------------------------------------------------------------------|-------------|
| City of Ecorse        | Public safety enhancement through improved street lighting.                                                         | \$350,000   |
| City of Flint         | Water system enhancement through improved waste management.                                                         | \$1,100,000 |
| City of Flint         | Water system enhancement through leak detection and pipe assessments.                                               | \$900,000   |
| City of Hamtramck     | Complete a property reappraisal to provide updated and accurate assessing records.                                  | \$167,860   |
| City of Hamtramck     | Upgrade City Hall security.                                                                                         | \$50,000    |
| City of Hamtramck     | Public safety enhancement through improved street lighting.                                                         | \$404,600   |
| City of Highland Park | Water system enhancement through meter replacement, leak detection, and system repairs.                             | \$2,000,000 |
| City of Inkster       | Complete a property reappraisal to provide updated and accurate assessing records.                                  | \$73,460    |
| City of Inkster       | Water system enhancement through fire hydrant repairs.                                                              | \$150,000   |
| City of Inkster       | Provide a backup power source for public safety.                                                                    | \$30,000    |
| City of Inkster       | Public safety enhancement through the creation of a multi-jurisdictional narcotic team.                             | \$240,000   |
| City of Inkster       | Public safety enhancement through police officer training.                                                          | \$41,970    |
| City of Inkster       | Public safety enhancement through the deployment of an additional police officer.                                   | \$320,000   |
| City of Lincoln Park  | Public safety enhancement through updated technology.                                                               | \$143,490   |
| City of Melvindale    | Public safety enhancement through fleet replacement of police vehicles and updated technology.                      | \$88,000    |
| City of Pontiac       | Community enhancement through blight management.                                                                    | \$125,000   |
| City of River Rouge   | Public safety enhancement through improved street lighting. Additionally, infrastructure replacements to City Hall. | \$591,508   |
| Royal Oak Township    | Public safety enhancement through improved street lighting                                                          | \$86,559    |
| Royal Oak Township    | Public safety enhancement of police services.                                                                       | \$217,593   |

Applications for the next round of Financially Distressed Cities, Villages, and Townships Grant Program will be available on the Department of Treasury website this spring. Applications must be submitted to Treasury by the close of business on XXX, XXX 31, 2015.

Preference is generally given to applicants from local units in which:

- A financial emergency has been declared in the past five years;
- An approved deficit elimination plan for the general fund is currently in place; or,
- Two or more conditions indicating "probable financial distress" currently exist.

For more information about FDCVT grants, including an application for cities, villages, and townships, visit [www.michigan.gov/revenuesharing](http://www.michigan.gov/revenuesharing).

###

\*Conditions of "probable financial distress" relating solely to school districts are not included as conditions for FDCVT, as school districts are not eligible.

## **Briefing: Grant announcement in Flint**

Tuesday, Feb. 3, 2015, 3-4 p.m.

Haskell Community Center, 2201 Forest Hills Ave. Flint

Governor's communications: Dave Murray, [murrayd1@michigan.gov](mailto:murrayd1@michigan.gov), 517-449-8343

DEQ communications: Brad Wurfel, [wurfelb@michigan.gov](mailto:wurfelb@michigan.gov), 517-230-8006

Treasury communications: Terry Stanton, [stantont@michigan.gov](mailto:stantont@michigan.gov), 517-830-5807

### **Purpose**

The state government is providing support for the Flint government as it addresses issues with its water system. The state on Tuesday is announcing that Flint is receiving two grants totaling \$2 million related to water system improvements through the Financially Distressed Cities, Villages and Townships grant program. DEQ Director Dan Wyant will address ongoing efforts with his agency to test Flint water and explain why the city is facing some of its problems. Senate Minority Leader Jim Ananich, D-Flint, will discuss his appreciation for the ongoing support for the city and its residents.

### **Attending**

- Harvey Hollins, director of the Michigan Office of Urban Initiatives
- Dan Wyant, director of the Michigan Department of Environmental Quality
- Wayne Workman, deputy treasurer, Michigan Department of Treasury
- Jerry Ambrose, Flint emergency manager
- Dayne Walling, Flint mayor
- State Sen. Jim Ananich
- State Rep. Sheldon Neeley
- State Rep. Phil Phelps

### **Agenda**

- |                    |                                                                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3:00 PM – 3:05 PM: | Harvey Hollins announces that Flint has received two grants totaling \$2 million.                                                                    |
| 3:05 PM – 3:10 PM: | Dan Wyant discusses the state's ongoing role in monitoring Flint's water and any assistance that has been provided and will continue to be provided. |
| 3:10 PM – 3:15 PM: | Mayor Dayne Walling remarks about appreciation for state assistance.                                                                                 |
| 3:15 PM – 3:20 PM: | Sen. Jim Ananich remarks about appreciation for state assistance.                                                                                    |
| 3:20 PM – 3:25 PM: | Rep. Neeley remarks.                                                                                                                                 |
| 3:25 PM – 3:35 PM: | Harvey Hollins closing remarks, opens floor to media questions.                                                                                      |
| 3:35 PM            | Event ends, though this might be optimistic.                                                                                                         |

### **Background**

- The quality of Flint water has been a high-profile concern in recent weeks, with residents complaining about the color, taste and smell of tap water since a switch to Flint River water as a temporary source as a pipeline is built to Lake Huron as a water source starting in 2016.
  - Residents have attended meetings with jugs of brownish water.
  - U.S. Kildee has worked with labor and community groups to distribute bottled water.

- Mayor Walling has issued a letter (included below) calling for state and federal assistance for the city, including forgiveness of some \$20 million in debt through the Drinking Water Revolving Loan Fund and calling for the governor to come to Flint personally.
  - Walling also submitted a guest column to the Flint Journal with similar requests.
    - He said the loan forgiveness is needed for the city to upgrade its water treatment process.
  - Governor and Mayor Walling had a telephone conversation on Friday, and the mayor has pledged to work together on solutions.
- Rep. Sheldon Neeley also has sent the governor a letter, saying that his constituents “are on the verge of civil unrest.”
- The Department of Environmental Quality has been monitoring the water situation, with a detailed backgrounder and talking points attached below.
- The Treasury Department is announcing Tuesday that Flint is among the cities receiving a combined \$8 million the Financially Distressed Cities, Villages and Townships grant program.
  - The announcement of the other grants will follow the Flint announcement.
    - The Flint grants are \$1.1 million to allow the city to replace the functions of the old incinerator with new water pollution control facility allowing for the disposal of waste to landfills.
    - The other is \$900,000 to allow the city to hire a contractor to perform a leak detection survey, which will lead to prioritizing repairs.
  - A breakdown of the grants is included below.

#### **Treasury breakdown of Flint grants**

Flint Incinerator: The grant project entails shutting down the current Water Pollution Control Facility Incinerator (due to the incinerator not being up to new EPA standards). In order to meet EPA standards, it would cost roughly \$8.8M in upgrades to the current incinerator. The grant funding will allow them to replace the functions of the old incinerator by constructing new facilities which will allow for the disposal of waste to landfills.

##### **Budget Breakdown**

|                         |                 |
|-------------------------|-----------------|
| Construction Contractor | \$1,050,000     |
| Project Management      | <u>\$50,000</u> |
| Total                   | \$1,100,000     |

Flint Leak Detection: The grant project will allow the city to hire a contractor to perform a leak detection survey of the city water lines. The city will receive a map of leak locations and an assessment of leak severity. This data will allow the city to prioritize leak repair. The project also covers the expense of conducting a water pipe line wall thickness condition assessment on a portion of the city's pipes. The assessment will guide the city's water main replacement program.

##### **Budget Breakdown**

|                               |           |
|-------------------------------|-----------|
| Project Planning              | \$90,000  |
| Mobilization of Crew to Site  | \$27,000  |
| Leak Detection < 16" diameter | \$378,000 |

|                                  |                  |
|----------------------------------|------------------|
| Leak Detection 16" diameter or > | \$270,000        |
| Pipe Condition Assessments       | <u>\$135,000</u> |
| Total                            | \$900,000        |

### DEQ backgrounder on Flint water

Following the formal approval of Flint into the KWA in 2012, DWSD sent Flint a letter saying their contract was thereby terminated (by early 2013).

Genesee County has been using DWSD water without a contract since May 2014. But Flint took the letter to imply a water cutoff, and promptly turned to DEQ with a proposal to use the Flint River (their historic backup system).

This proposed shift was pitched primarily as a money saver. But it put the city in the business of water production, where they historically had been in the business of water transmission. DEQ approved the use of the river as a source, based on the treatment plant's past performance as a standby facility and the improvements we outlined prior to a switchover.

Several municipalities around the state use surface water supplies (rivers): Blissfield near Monroe, Manistique, and Alma to name a few.

The city completed the upgrades at the water plant the facility and DEQ approved it April 2014.

There were some initial hiccups. Last summer, there were a couple of 'boil water' notices issued. One for a water test that showed e. coli, one for a break in the water main.

The challenge to using the Flint River as a source is that the condition of the water is variable and changes with season and weather. It has substantially more organic matter than deep lake sources like Lake Huron. This organic matter is mobilized by high water events, and warm weather also can account for more organic material in the water.

The treatment of the organic matter is done with chlorine. One might conclude that the continual answer is just to use more chlorine to achieve water safety. However, at some point on the continuum, the chlorine and organic matter create TTHM – total trihalomethanes – as a byproduct. When the standard for those is exceeded over several consecutive quarters of testing, the supply is required by law to issue public notice and submit an approved plan for addressing the situation.

You'll note that this regulatory approach means TTHM testing is done quarterly. That means people who use the system are exposed to TTHM for several months before the public notice is required. It's because TTHM is a chronic health threat. Over the long term (measured in decades), continued exposure can contribute to some known health problems. If this were an immediate health threat, customers would receive immediate notification to boil their water or not use it.

Put in context, the EPA (which established the standard and the rule) estimates the existence of the TTHM standard prevents an estimated 280 bladder cancer cases each year ... out of more than 330 million people who use public water supplies around the country.

It's not "nothing." State and federal law requires quarterly testing for TTHM and that the public be informed of it when the annual average of four quarters' worth of consecutive testing shows TTHM



levels exceeding 80 parts per billion. Flint's results managed to exceed the annual average in three quarters, and they must develop a plan to address it.

But it's not like an eminent threat to public health. Unlike an e. Coli or even total coliform bacteria maximum contaminant level, which require immediate public notification and response and are part of daily / hourly testing of public water supplies, TTHMs pose a public health concern with chronic, long-term exposure.

It's clear the nature of the threat was communicated poorly. It's also clear that folks in Flint are concerned about other aspects of their water – taste, smell and color being among the top complaints.

The Safe Drinking Water Act requires public water supplies be tested for more than 90 regulated contaminants, including microbial contaminants. The act, and the program here in Michigan, work to ensure that water is safe to drink. The act does not regulate aesthetic values of water. Here are some factors affecting the aesthetics of water in Flint.

1. It's the Flint River. The water supplied by DWSD historically came from Lake Huron. It's softer. With hard water, you get a different flavor and feel. It's why General Motors suspended use of Flint Water – it was rusting their parts. Also, there's the 'organics' factor (discussed previously).
2. The system is old. Flint has more than 500 miles of water pipes. More than half of those pipe miles are more than 75 years old. Much of it is cast iron. Hard water can react with cast iron and exacerbates the rusty factor, which creates that brown water that angry residents were holding up in jugs for the media cameras last week. Valve failure has also been a key challenge. The system has an estimated 7,500+ valves. When they stick open or stick shut, it affects the hydraulics of the system and increase areas of stagnation. The city has a backlog of valves that need to be addressed. They've done half a dozen or so since November.
3. Flint is old. Many of the homes served by the system are old. Brown water complaints may also be attributable to cast iron pipes in customers' service connection to the city lines. The DEQ has been encouraging people with water coloration concerns to contact the city and see whether it is the service line or the City's line causing the issue. Again, discoloration is not an indicator of water quality or water safety, but we recognize that nobody likes it.

**In summary**, the City of Flint has tremendous need to address its water delivery system. We are not aware that they have any capital improvement funds for preventative maintenance in place, much less line replacement project monies that will require hundreds of millions.

The City was approved for a Revolving Fund loan in 2008 or 2009. As a Distressed Community, they qualified for flexible terms and 2 percent interest rate Revolving Fund Loan. After they were notified they were approved for the loan, they declined it. Previous SRF loans from the state to Flint bear an outstanding balance of \$20.7 million today.

The DEQ continues working with the city to address the TTHM issue. They can take interim steps – from scrubbing the insides of transmission lines to carefully monitoring the hydraulic challenges in their system – to address customers' aesthetic concerns. Their TTHM numbers already are showing dramatic improvement; the November testing showed only one of seven sample points exceeding the standard.

The key now is that the standard is an average of three quarters' worth of results. It will be some time before they are officially "not in violation." However, depending on weather in 2015, it's not unforeseeable that we will be having this conversation again by next Christmas.

The key to the conversation is that TTHM is not a top health concern. That's key because residents need to understand TTHM in context, and it is key because it appears the mayor has seized on the public panic (sparked, frankly, by their poor communication of the violation notice) to ask the state for loan forgiveness and more money for their infrastructure improvement.

Another key thing to remember is that once the city connects to the new KWA system in 2016, this issue will fade in the rearview.

#### **Key messages:**

1. The DEQ Drinking Water program works with communities around the state to ensure that municipalities provide customers with clean, safe drinking water.
2. Municipal water supplies are tested rigorously and regularly for more than 90 regulated contaminants, including microbial contaminants that pose an immediate public health concern.
3. Flint's exceedance of the TTHM standard should reassure residents that the testing program is effective.
4. TTHM is not an immediate health threat. It is a chronic concern, one that can be problematic over the course of several decades of exposure. The public was notified because the law requires the city to make public notification, so that everyone can make informed decisions. This is particularly true for people with infants or those with compromised immune systems.
5. The DEQ is working with the City to address the situation. Recent tests show the TTHM numbers dropping rapidly. The department will continue working with the city in the months ahead, and residents should feel confident that their water is safe to drink unless the DEQ or City notifies them otherwise.
6. The discoloration and odor issues some Flint residents are experiencing are separate issues from the TTHM issue. TTHM is odorless, colorless and measured in parts per billion.
7. Flint water customers who have questions or concerns about their water should first contact the city to get answers and help. They also can contact the Michigan DEQ.

#### **Mayor Walling's Facebook post**

Friend,

Access to clean, safe, affordable water is a basic human right.

That's why I just sent Gov. Snyder my Flint Water Improvement Plan. It focuses on the areas of safety, quality, access, investment and education. My letter urges the governor to quickly implement these ideas so that Flint's water is 100% safe.

Please contact Gov. Snyder by calling (517) 335-6397 (or by clicking [here](#)) and ask him to take action immediately to implement my plan and ensure Flint's water is safe.

My plan offers new ideas and also builds on successful models of utility, energy and assistance programs at the state and federal levels. Here is my plan:

#### **Safety & Quality**

- 100% Safety is the standard

- City of Flint releases testing data to assure safety and expands testing to households with support from the Michigan Department of Environmental Quality
- Support alternatives for those advised not to drink the water by their doctors through the Michigan Health Endowment Fund and community partners to protect the vulnerable like seniors and infants
- Bring on experienced river water treatment operational management in the City of Flint
- Require water testing data to be released quarterly by law in all Michigan communities

#### Access

- Announce an amnesty program for turn-ons and reduce the turn-on cost in Flint
- Develop a revised payment plan policy to allow customers to come back on to the Flint system
- New Federal and State partnership to establish new Drinking Water Emergency Assistance Fund for customers (modeled on Federal and State energy utility programs: Low Income Home Energy Assistance Program; Michigan Energy Assistance Program; State Emergency Relief)

#### Investment

- Accelerate water system improvements outlined in the City of Flint Capital Improvement Plan through Federal and State Investments
- State approves City of Flint's Distressed Cities Fund applications
- Federal and State forgiveness of payment to Drinking Water Revolving Loan Fund
- Federal and State financing for future improvements
- City Water Department implements budgeted FY15 projects including leak detection, valve repairs, new pipes and meter replacements

#### Education

- Develop a community partnership to provide household and business customers with information on testing and conservation
- Ongoing partnership with Michigan Department of Human Services, United Way, Salvation Army and community organizations to provide information on water assistance
- Expand youth energy initiative to assist households with conservation and efficiency (piloted in summer 2014 with Northwestern High School students, EcoWorks and Consumers Energy)

The struggle with our water has gone on for too long. The state must take action and do its part. Please ask Gov. Snyder to take action immediately to implement my plan and ensure Flint's water is safe. Thank you for your ongoing support.

#### Links to coverage

- [Mayor, governor have 'long, productive' talk about Flint's water problems](#), Jan. 30
- [2,000 more gallons of water headed to Flint for giveaway](#), Jan. 30, 2015
- [Flint emergency manager says there are two big reasons not to reconnect Detroit water](#), Jan. 29
- [Flint Democracy Defense League plans four meetings on city's water problems](#), Jan. 29
- [Environmentalism sends out new warnings about Flint water](#), NBC, Jan. 27
- [Erin Brockovich says on Facebook she's prepared to come to Flint](#), MLive, Jan. 27
- [Mott Community College not waiting for Flint to ensure safe water](#), MLive, Jan. 26
- [Detroit water chief says she's willing to sell emergency water to Flint -- no strings attached](#), Jan. 26
- [Mayor says governor needs to visit Flint to see water crisis first hand](#), MLive, Jan. 26
- [Need water? Flint groups collect 600 cases, plan distribution this week](#), MLive, Jan. 26

- Incoming Flint water expert would have 'continual oversight' until new pipeline connected, Jan. 25
- Looking back at Flint's water problems (photo gallery), MLive, Jan. 25
- Flint water problems: Switch aimed to save \$5 million -- but at what cost?, MLive, Jan. 23
- State says its already 'working diligently' on Flint's water problems, MLive, Jan. 22
- Officials say Flint water is getting better, but many residents unsatisfied, MLive, Jan. 21



STATE OF MICHIGAN  
EXECUTIVE OFFICE  
LANSING

RICK SNYDER  
GOVERNOR

BRIAN CALLEY  
LT. GOVERNOR

**CONTACTS:**

Sara Wurfel or Dave Murray, Governor's Office  
517-335-6397  
Terry Stanton, Department of Treasury  
517-335-2167

**FOR IMMEDIATE RELEASE**

December 14, 2015

## **Gov. Rick Snyder awards Flint \$2 million in Distressed Cities grants for water system infrastructure improvements**

*Funding to be used for leak detection, waste incinerator replacement*

LANSING, Mich. – Gov. Rick Snyder today awarded Flint \$2 million in grants for water system infrastructure improvements, part of an overall \$8 million plan to help cities through the Financially Distressed Cities, Villages, and Townships Grant Program.

Flint is among six municipalities receiving grants through the program. The city will use the funding to detect leaks in its water lines and replace its Water Pollution Control Facility Incinerator.

"There are opportunities for the state government to assist Flint city leaders as they address issues related to the city's water system," Snyder said. "These grants will help recovering cities improve public services and infrastructure, improving the quality of life for all residents."

The grants to Flint were announced today at the Haskell Community Center by Harvey Hollins, director of the state's Office of Urban Initiatives and Wayne Workman, the state's deputy treasurer. They were joined by Dan Wyant, director of the Michigan Department of Environmental Quality, Flint Emergency Manager Jerry Ambrose, Mayor Dayne Walling, state Senate Minority Leader Jim Ananich, state Reps. Sheldon Neeley and Phil Phelps.

Flint was awarded \$900,000 to allow the city to hire a contractor to perform a leak detection survey of the city water lines. The city will receive a map of leak locations and an assessment of leak severity, allowing the city to prioritize leak repair. The project also covers the expense of conducting a water pipe line wall thickness condition assessment on a portion of the city's pipes. The assessment will guide the city's water main replacement program.

The city also was awarded \$1.1 million to shut down its current Water Pollution Control Facility incinerator and replace it with new facilities which will allow for the disposal of waste in landfills. The existing facilities are not up to federal Environmental Protection Agency standards.

Municipalities are eligible for the grants if they are experiencing one or more conditions indicative of "probable financial stress," as defined by Public Act 436 of 2012, the Local Financial Stability and Choice Act.

Under the grant program, funding may be used to pay for specific projects, services, or strategies that move a city, village, or township toward financial stability. There was \$8 million appropriated for the program with a \$2 million cap, per local unit.

##

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, October 29, 2015 8:22 AM  
**To:** Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** FW: Flint Home Owner's Lead data thru October 28, 2015  
**Attachments:** Flint Home Owners Data Thru October 28,2015.xlsx

Adam,

Can you double check this to make sure we have the same data as George.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

---

**From:** Krisztian, George (DEQ)  
**Sent:** Wednesday, October 28, 2015 4:53 PM  
**To:** Sygo, Jim (DEQ); Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Tommasulo, Karen (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ)  
**Cc:** Thelen, Mary Beth (DEQ); Shaler, Karen (DEQ)  
**Subject:** Flint Home Owner's Lead data thru October 28, 2015

Attached is the latest data for Homeowner's in Flint. The spreadsheet includes samples submitted to the DEQ Lab from September 3<sup>rd</sup> thru October 26<sup>th</sup>.

- Of the 306 samples, 238 (77.7%) were at levels of 5ppb and lower for lead
- The 90<sup>th</sup> percentile value is 10 ppb

George

George L. Krisztian  
 Flint Action Plan Coordinator  
 Laboratory Director  
 Michigan Department of Environmental Quality  
 Desk ph (517) 284-6719  
 Cell ph (517) 420-5897

| SAMPNO  | Contact      | SUBDATE   | ACODE | RESULT |
|---------|--------------|-----------|-------|--------|
| LF84899 | MIKE GLASGOW | 25-Sep-15 | PB    | 0.000  |
| LF85330 | MIKE GLASGOW | 29-Sep-15 | PB    | 0.000  |
| LF85604 | MIKE GLASGOW | 30-Sep-15 | PB    | 0.000  |
| LF85613 | MIKE GLASGOW | 30-Sep-15 | PB    | 0.000  |
| LF85796 | MIKE GLASGOW | 01-Oct-15 | PB    | 0.000  |
| LF85797 | MIKE GLASGOW | 01-Oct-15 | PB    | 0.000  |
| LF85799 | MIKE GLASGOW | 01-Oct-15 | PB    | 0.000  |
| LF85802 | MIKE GLASGOW | 01-Oct-15 | PB    | 0.000  |
| LF85862 | MIKE GLASGOW | 01-Oct-15 | PB    | 0.000  |
| LF85931 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF85933 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF85936 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF85945 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF85947 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF85954 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF85957 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF85960 | MIKE GLASGOW | 02-Oct-15 | PB    | 0.000  |
| LF87007 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
| LF87012 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
| LF87022 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
| LF87023 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
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| LF87033 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
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| LF87045 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
| LF87047 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
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| LF87064 | MIKE GLASGOW | 08-Oct-15 | PB    | 0.000  |
| LF87365 | MIKE GLASGOW | 13-Oct-15 | PB    | 0.000  |
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| LF87398 | MIKE GLASGOW | 13-Oct-15 | PB    | 0.000  |
| LF87405 | MIKE GLASGOW | 13-Oct-15 | PB    | 0.000  |
| LF87415 | MIKE GLASGOW | 13-Oct-15 | PB    | 0.000  |
| LF87418 | MIKE GLASGOW | 13-Oct-15 | PB    | 0.000  |
| LF87419 | MIKE GLASGOW | 13-Oct-15 | PB    | 0.000  |



|         |              |           |    |       |
|---------|--------------|-----------|----|-------|
| LF87423 | MIKE GLASGOW | 13-Oct-15 | PB | 0.000 |
| LF87428 | MIKE GLASGOW | 13-Oct-15 | PB | 0.000 |
| LF87431 | MIKE GLASGOW | 13-Oct-15 | PB | 0.000 |
| LF87432 | MIKE GLASGOW | 13-Oct-15 | PB | 0.000 |
| LF87434 | MIKE GLASGOW | 13-Oct-15 | PB | 0.000 |
| LF87927 | MIKE GLASGOW | 16-Oct-15 | PB | 0.000 |
| LF87929 | MIKE GLASGOW | 16-Oct-15 | PB | 0.000 |
| LF87932 | MIKE GLASGOW | 16-Oct-15 | PB | 0.000 |
| LF87938 | MIKE GLASGOW | 16-Oct-15 | PB | 0.000 |
| LF87942 | MIKE GLASGOW | 16-Oct-15 | PB | 0.000 |
| LF87946 | MIKE GLASGOW | 16-Oct-15 | PB | 0.000 |
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| LF88285 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88286 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88292 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88293 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88295 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88296 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88298 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
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| LF88306 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
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| LF88309 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88310 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88313 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88316 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88317 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88318 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88319 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88323 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88325 | MIKE GLASGOW | 20-Oct-15 | PB | 0.000 |
| LF88950 | MIKE GLASGOW | 26-Oct-15 | PB | 0.000 |
| LF88952 | MIKE GLASGOW | 26-Oct-15 | PB | 0.000 |
| LF88953 | MIKE GLASGOW | 26-Oct-15 | PB | 0.000 |
| LF88956 | MIKE GLASGOW | 26-Oct-15 | PB | 0.000 |
| LF88973 | MIKE GLASGOW | 26-Oct-15 | PB | 0.000 |
| LF82709 | MIKE GLASGOW | 15-Sep-15 | PB | 0.001 |
| LF84317 | MIKE GLASGOW | 23-Sep-15 | PB | 0.001 |
| LF84896 | MIKE GLASGOW | 25-Sep-15 | PB | 0.001 |
| LF85605 | MIKE GLASGOW | 30-Sep-15 | PB | 0.001 |
| LF85608 | MIKE GLASGOW | 30-Sep-15 | PB | 0.001 |
| LF85800 | MIKE GLASGOW | 01-Oct-15 | PB | 0.001 |
| LF85934 | MIKE GLASGOW | 02-Oct-15 | PB | 0.001 |
| LF85937 | MIKE GLASGOW | 02-Oct-15 | PB | 0.001 |
| LF85939 | MIKE GLASGOW | 02-Oct-15 | PB | 0.001 |
| LF85942 | MIKE GLASGOW | 02-Oct-15 | PB | 0.001 |
| LF85951 | MIKE GLASGOW | 02-Oct-15 | PB | 0.001 |
| LF85959 | MIKE GLASGOW | 02-Oct-15 | PB | 0.001 |
| LF87013 | MIKE GLASGOW | 08-Oct-15 | PB | 0.001 |
| LF87015 | MIKE GLASGOW | 08-Oct-15 | PB | 0.001 |
| LF87016 | MIKE GLASGOW | 08-Oct-15 | PB | 0.001 |
| LF87028 | MIKE GLASGOW | 08-Oct-15 | PB | 0.001 |

|         |              |           |    |       |
|---------|--------------|-----------|----|-------|
| LF87044 | MIKE GLASGOW | 08-Oct-15 | PB | 0.001 |
| LF87046 | MIKE GLASGOW | 08-Oct-15 | PB | 0.001 |
| LF87053 | MIKE GLASGOW | 08-Oct-15 | PB | 0.001 |
| LF87367 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87380 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87382 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87384 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87411 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87417 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87424 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87427 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87433 | MIKE GLASGOW | 13-Oct-15 | PB | 0.001 |
| LF87930 | MIKE GLASGOW | 16-Oct-15 | PB | 0.001 |
| LF88278 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88290 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88291 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88297 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88299 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88304 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88305 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88312 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88315 | MIKE GLASGOW | 20-Oct-15 | PB | 0.001 |
| LF88959 | MIKE GLASGOW | 26-Oct-15 | PB | 0.001 |
| LF88965 | MIKE GLASGOW | 26-Oct-15 | PB | 0.001 |
| LF81254 | MIKE GLASGOW | 03-Sep-15 | PB | 0.002 |
| LF82707 | MIKE GLASGOW | 15-Sep-15 | PB | 0.002 |
| LF84313 | MIKE GLASGOW | 23-Sep-15 | PB | 0.002 |
| LF84900 | MIKE GLASGOW | 25-Sep-15 | PB | 0.002 |
| LF85291 | MIKE GLASGOW | 29-Sep-15 | PB | 0.002 |
| LF85601 | MIKE GLASGOW | 30-Sep-15 | PB | 0.002 |
| LF85606 | MIKE GLASGOW | 30-Sep-15 | PB | 0.002 |
| LF85610 | MIKE GLASGOW | 30-Sep-15 | PB | 0.002 |
| LF85612 | MIKE GLASGOW | 30-Sep-15 | PB | 0.002 |
| LF85795 | MIKE GLASGOW | 01-Oct-15 | PB | 0.002 |
| LF85858 | MIKE GLASGOW | 01-Oct-15 | PB | 0.002 |
| LF85861 | MIKE GLASGOW | 01-Oct-15 | PB | 0.002 |
| LF85932 | MIKE GLASGOW | 02-Oct-15 | PB | 0.002 |
| LF85946 | MIKE GLASGOW | 02-Oct-15 | PB | 0.002 |
| LF85950 | MIKE GLASGOW | 02-Oct-15 | PB | 0.002 |
| LF85958 | MIKE GLASGOW | 02-Oct-15 | PB | 0.002 |
| LF87020 | MIKE GLASGOW | 08-Oct-15 | PB | 0.002 |
| LF87026 | MIKE GLASGOW | 08-Oct-15 | PB | 0.002 |
| LF87027 | MIKE GLASGOW | 08-Oct-15 | PB | 0.002 |
| LF87049 | MIKE GLASGOW | 08-Oct-15 | PB | 0.002 |
| LF87059 | MIKE GLASGOW | 08-Oct-15 | PB | 0.002 |
| LF87063 | MIKE GLASGOW | 08-Oct-15 | PB | 0.002 |
| LF87368 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87376 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87381 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87391 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87393 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87400 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87404 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87408 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87410 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |

|         |              |           |    |       |
|---------|--------------|-----------|----|-------|
| LF87413 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87420 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87422 | MIKE GLASGOW | 13-Oct-15 | PB | 0.002 |
| LF87933 | MIKE GLASGOW | 16-Oct-15 | PB | 0.002 |
| LF87934 | MIKE GLASGOW | 16-Oct-15 | PB | 0.002 |
| LF87935 | MIKE GLASGOW | 16-Oct-15 | PB | 0.002 |
| LF87944 | MIKE GLASGOW | 16-Oct-15 | PB | 0.002 |
| LF88288 | MIKE GLASGOW | 20-Oct-15 | PB | 0.002 |
| LF88294 | MIKE GLASGOW | 20-Oct-15 | PB | 0.002 |
| LF88303 | MIKE GLASGOW | 20-Oct-15 | PB | 0.002 |
| LF88314 | MIKE GLASGOW | 20-Oct-15 | PB | 0.002 |
| LF88321 | MIKE GLASGOW | 20-Oct-15 | PB | 0.002 |
| LF88324 | MIKE GLASGOW | 20-Oct-15 | PB | 0.002 |
| LF88958 | MIKE GLASGOW | 26-Oct-15 | PB | 0.002 |
| LF88971 | MIKE GLASGOW | 26-Oct-15 | PB | 0.002 |
| LF85285 | MIKE GLASGOW | 29-Sep-15 | PB | 0.003 |
| LF85288 | MIKE GLASGOW | 29-Sep-15 | PB | 0.003 |
| LF85614 | MIKE GLASGOW | 30-Sep-15 | PB | 0.003 |
| LF85857 | MIKE GLASGOW | 01-Oct-15 | PB | 0.003 |
| LF85930 | MIKE GLASGOW | 02-Oct-15 | PB | 0.003 |
| LF85938 | MIKE GLASGOW | 02-Oct-15 | PB | 0.003 |
| LF85952 | MIKE GLASGOW | 02-Oct-15 | PB | 0.003 |
| LF87014 | MIKE GLASGOW | 08-Oct-15 | PB | 0.003 |
| LF87017 | MIKE GLASGOW | 08-Oct-15 | PB | 0.003 |
| LF87039 | MIKE GLASGOW | 08-Oct-15 | PB | 0.003 |
| LF87041 | MIKE GLASGOW | 08-Oct-15 | PB | 0.003 |
| LF87055 | MIKE GLASGOW | 08-Oct-15 | PB | 0.003 |
| LF87058 | MIKE GLASGOW | 08-Oct-15 | PB | 0.003 |
| LF87364 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87371 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87377 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87402 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87409 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87414 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87425 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87430 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87436 | MIKE GLASGOW | 13-Oct-15 | PB | 0.003 |
| LF87947 | MIKE GLASGOW | 16-Oct-15 | PB | 0.003 |
| LF88957 | MIKE GLASGOW | 26-Oct-15 | PB | 0.003 |
| LF82708 | MIKE GLASGOW | 15-Sep-15 | PB | 0.004 |
| LF85603 | MIKE GLASGOW | 30-Sep-15 | PB | 0.004 |
| LF85609 | MIKE GLASGOW | 30-Sep-15 | PB | 0.004 |
| LF85615 | MIKE GLASGOW | 30-Sep-15 | PB | 0.004 |
| LF85944 | MIKE GLASGOW | 02-Oct-15 | PB | 0.004 |
| LF85953 | MIKE GLASGOW | 02-Oct-15 | PB | 0.004 |
| LF87010 | MIKE GLASGOW | 08-Oct-15 | PB | 0.004 |
| LF87057 | MIKE GLASGOW | 08-Oct-15 | PB | 0.004 |
| LF87387 | MIKE GLASGOW | 13-Oct-15 | PB | 0.004 |
| LF87421 | MIKE GLASGOW | 13-Oct-15 | PB | 0.004 |
| LF87435 | MIKE GLASGOW | 13-Oct-15 | PB | 0.004 |
| LF87943 | MIKE GLASGOW | 16-Oct-15 | PB | 0.004 |
| LF88301 | MIKE GLASGOW | 20-Oct-15 | PB | 0.004 |
| LF88320 | MIKE GLASGOW | 20-Oct-15 | PB | 0.004 |
| LF88949 | MIKE GLASGOW | 26-Oct-15 | PB | 0.004 |
| LF88951 | MIKE GLASGOW | 26-Oct-15 | PB | 0.004 |

|         |              |           |    |       |
|---------|--------------|-----------|----|-------|
| LF88955 | MIKE GLASGOW | 26-Oct-15 | PB | 0.004 |
| LF88961 | MIKE GLASGOW | 26-Oct-15 | PB | 0.004 |
| LF82706 | MIKE GLASGOW | 15-Sep-15 | PB | 0.005 |
| LF84314 | MIKE GLASGOW | 23-Sep-15 | PB | 0.005 |
| LF85856 | MIKE GLASGOW | 01-Oct-15 | PB | 0.005 |
| LF85863 | MIKE GLASGOW | 01-Oct-15 | PB | 0.005 |
| LF85943 | MIKE GLASGOW | 02-Oct-15 | PB | 0.005 |
| LF87011 | MIKE GLASGOW | 08-Oct-15 | PB | 0.005 |
| LF87019 | MIKE GLASGOW | 08-Oct-15 | PB | 0.005 |
| LF87062 | MIKE GLASGOW | 08-Oct-15 | PB | 0.005 |
| LF87374 | MIKE GLASGOW | 13-Oct-15 | PB | 0.005 |
| LF87388 | MIKE GLASGOW | 13-Oct-15 | PB | 0.005 |
| LF87412 | MIKE GLASGOW | 13-Oct-15 | PB | 0.005 |
| LF87931 | MIKE GLASGOW | 16-Oct-15 | PB | 0.005 |
| LF87936 | MIKE GLASGOW | 16-Oct-15 | PB | 0.005 |
| LF87941 | MIKE GLASGOW | 16-Oct-15 | PB | 0.005 |
| LF87945 | MIKE GLASGOW | 16-Oct-15 | PB | 0.005 |
| LF88311 | MIKE GLASGOW | 20-Oct-15 | PB | 0.005 |
| LF88972 | MIKE GLASGOW | 26-Oct-15 | PB | 0.005 |
| LF84898 | MIKE GLASGOW | 25-Sep-15 | PB | 0.006 |
| LF85290 | MIKE GLASGOW | 29-Sep-15 | PB | 0.006 |
| LF85602 | MIKE GLASGOW | 30-Sep-15 | PB | 0.006 |
| LF85801 | MIKE GLASGOW | 01-Oct-15 | PB | 0.006 |
| LF85859 | MIKE GLASGOW | 01-Oct-15 | PB | 0.006 |
| LF87009 | MIKE GLASGOW | 08-Oct-15 | PB | 0.006 |
| LF87021 | MIKE GLASGOW | 08-Oct-15 | PB | 0.006 |
| LF87042 | MIKE GLASGOW | 08-Oct-15 | PB | 0.006 |
| LF87043 | MIKE GLASGOW | 08-Oct-15 | PB | 0.006 |
| LF87048 | MIKE GLASGOW | 08-Oct-15 | PB | 0.006 |
| LF87056 | MIKE GLASGOW | 08-Oct-15 | PB | 0.006 |
| LF87385 | MIKE GLASGOW | 13-Oct-15 | PB | 0.006 |
| LF87407 | MIKE GLASGOW | 13-Oct-15 | PB | 0.006 |
| LF88282 | MIKE GLASGOW | 20-Oct-15 | PB | 0.006 |
| LF84315 | MIKE GLASGOW | 23-Sep-15 | PB | 0.007 |
| LF85798 | MIKE GLASGOW | 01-Oct-15 | PB | 0.007 |
| LF85940 | MIKE GLASGOW | 02-Oct-15 | PB | 0.007 |
| LF85955 | MIKE GLASGOW | 02-Oct-15 | PB | 0.007 |
| LF87036 | MIKE GLASGOW | 08-Oct-15 | PB | 0.007 |
| LF87375 | MIKE GLASGOW | 13-Oct-15 | PB | 0.007 |
| LF87389 | MIKE GLASGOW | 13-Oct-15 | PB | 0.007 |
| LF87406 | MIKE GLASGOW | 13-Oct-15 | PB | 0.007 |
| LF88322 | MIKE GLASGOW | 20-Oct-15 | PB | 0.007 |
| LF85286 | MIKE GLASGOW | 29-Sep-15 | PB | 0.008 |
| LF87018 | MIKE GLASGOW | 08-Oct-15 | PB | 0.008 |
| LF87034 | MIKE GLASGOW | 08-Oct-15 | PB | 0.008 |
| LF87038 | MIKE GLASGOW | 08-Oct-15 | PB | 0.008 |
| LF87928 | MIKE GLASGOW | 16-Oct-15 | PB | 0.008 |
| LF88279 | MIKE GLASGOW | 20-Oct-15 | PB | 0.008 |
| LF88289 | MIKE GLASGOW | 20-Oct-15 | PB | 0.008 |
| LF85949 | MIKE GLASGOW | 02-Oct-15 | PB | 0.009 |
| LF85956 | MIKE GLASGOW | 02-Oct-15 | PB | 0.009 |
| LF87060 | MIKE GLASGOW | 08-Oct-15 | PB | 0.009 |
| LF87065 | MIKE GLASGOW | 08-Oct-15 | PB | 0.009 |
| LF85289 | MIKE GLASGOW | 29-Sep-15 | PB | 0.010 |
| LF85941 | MIKE GLASGOW | 02-Oct-15 | PB | 0.010 |

|         |              |           |    |       |
|---------|--------------|-----------|----|-------|
| LF87008 | MIKE GLASGOW | 08-Oct-15 | PB | 0.010 |
| LF87401 | MIKE GLASGOW | 13-Oct-15 | PB | 0.010 |
| LF87937 | MIKE GLASGOW | 16-Oct-15 | PB | 0.010 |
| LF85929 | MIKE GLASGOW | 02-Oct-15 | PB | 0.011 |
| LF87052 | MIKE GLASGOW | 08-Oct-15 | PB | 0.011 |
| LF87939 | MIKE GLASGOW | 16-Oct-15 | PB | 0.011 |
| LF85607 | MIKE GLASGOW | 30-Sep-15 | PB | 0.012 |
| LF85287 | MIKE GLASGOW | 29-Sep-15 | PB | 0.013 |
| LF87429 | MIKE GLASGOW | 13-Oct-15 | PB | 0.013 |
| LF87373 | MIKE GLASGOW | 13-Oct-15 | PB | 0.014 |
| LF88287 | MIKE GLASGOW | 20-Oct-15 | PB | 0.015 |
| LF87940 | MIKE GLASGOW | 16-Oct-15 | PB | 0.016 |
| LF87366 | MIKE GLASGOW | 13-Oct-15 | PB | 0.017 |
| LF87396 | MIKE GLASGOW | 13-Oct-15 | PB | 0.017 |
| LF85935 | MIKE GLASGOW | 02-Oct-15 | PB | 0.018 |
| LF85329 | MIKE GLASGOW | 29-Sep-15 | PB | 0.019 |
| LF87390 | MIKE GLASGOW | 13-Oct-15 | PB | 0.019 |
| LF84316 | MIKE GLASGOW | 23-Sep-15 | PB | 0.020 |
| LF87416 | MIKE GLASGOW | 13-Oct-15 | PB | 0.020 |
| LF87399 | MIKE GLASGOW | 13-Oct-15 | PB | 0.021 |
| LF88307 | MIKE GLASGOW | 20-Oct-15 | PB | 0.026 |
| LF87403 | MIKE GLASGOW | 13-Oct-15 | PB | 0.027 |
| LF81253 | MIKE GLASGOW | 03-Sep-15 | PB | 0.028 |
| LF85948 | MIKE GLASGOW | 02-Oct-15 | PB | 0.030 |
| LF88954 | MIKE GLASGOW | 26-Oct-15 | PB | 0.036 |
| LF85860 | MIKE GLASGOW | 01-Oct-15 | PB | 0.041 |
| LF87040 | MIKE GLASGOW | 08-Oct-15 | PB | 0.074 |
| LF85611 | MIKE GLASGOW | 30-Sep-15 | PB | 0.075 |
| LF87426 | MIKE GLASGOW | 13-Oct-15 | PB | 0.078 |
| LF88300 | MIKE GLASGOW | 20-Oct-15 | PB | 0.088 |
| LF88960 | MIKE GLASGOW | 26-Oct-15 | PB | 0.131 |
| LF84897 | MIKE GLASGOW | 25-Sep-15 | PB | 0.327 |

| REPADD1         | REPADD2 | REPADD3 | INVADD1    | INVADD2 | INVADD3 |
|-----------------|---------|---------|------------|---------|---------|
| 4500 N DORT HWY |         | FLINT   | 1930       | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 1505 W     | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 605        | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 4307       | FLINT   | 48507   |
| 4500 N DORT HWY |         | FLINT   | 2422       | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | 3729       | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 3617       | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 1222       | FLINT   | 48507   |
| 4500 N DORT HWY |         | FLINT   | 605        | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 1359       | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | 3701 N     | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 1359       | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | G3139      | FLINT   | 48532   |
| 4500 N DORT HWY |         | FLINT   | G3139      | FLINT   | 48532   |
| 4500 N DORT HWY |         | FLINT   | 23009      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 1001       | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 2309       | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | G3376      | FLINT   |         |
| 4500 N DORT HWY |         | FLINT   | 1107 BEARD | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 211 W      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 2013       | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 3447 BARTH | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | 2309       | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 3701       | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 3807 N     | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 3310 E     | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 5813       | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | 3810       | FLINT   | 48532   |
| 4500 N DORT HWY |         | FLINT   |            |         |         |
| 4500 N DORT HWY |         | FLINT   | 1101 S     | FLINT   | 48502   |
| 4500 N DORT HWY |         | FLINT   | 3713       | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 4123       | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 4500 N     | FLINT   | 48505   |
| 4500 N DORT HWY |         | FLINT   | 3514       | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 336        | FLINT   |         |
| 4500 N DORT HWY |         | FLINT   | 1160       | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | 414        | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 3800       | FLINT   |         |
| 4500 N DORT HWY |         | FLINT   | 822 FRANK  | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | 2516       | FLINT   | 48504   |
| 4500 N DORT HWY |         | FLINT   | 3224 N     | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 3741 JOAL  | FLINT   | 48506   |
| 4500 N DORT HWY |         | FLINT   | 1401       | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 902 E      | FLINT   | 48503   |
| 4500 N DORT HWY |         | FLINT   | 820        | FLINT   | 48505   |
| 4500 N DORT HWY |         | FLINT   | 1160       | FLINT   | 48504   |

|                 |  |       |            |       |       |
|-----------------|--|-------|------------|-------|-------|
| 4500 N DORT HWY |  | FLINT | 518 MASON  | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 4060       | FLINT |       |
| 4500 N DORT HWY |  | FLINT | 1705       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 2010       | FLINT | 48504 |
| 4500 N DORT HWY |  | FLINT | 906        | FLINT | 48505 |
| 4500 N DORT HWY |  | FLINT | 422        | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3248       | FLINT | 48504 |
| 4500 N DORT HWY |  | FLINT | 2306       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3730       | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 932        | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 5714       | FLINT |       |
| 4500 N DORT HWY |  | FLINT | 555 S      | FLINT | 48502 |
| 4500 N DORT HWY |  | FLINT | 1002       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 119 N      | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 987        | FLINT | 48532 |
| 4500 N DORT HWY |  | FLINT | 3813       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 5905       | FLINT | 48504 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3813       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 317 W      | FLINT |       |
| 4500 N DORT HWY |  | FLINT | 3821       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3510       | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3813       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 1549 E     | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 4025       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 3709       | FLINT | 48532 |
| 4500 N DORT HWY |  | FLINT | 3813       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 914        | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2761       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 618 E      | FLINT | 48505 |
| 4500 N DORT HWY |  | FLINT | 705        | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 125 E      | FLINT | 48502 |
| 4500 N DORT HWY |  | FLINT | 418 W      | FLINT | 48505 |
| 4500 N DORT HWY |  | FLINT | 819        | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3705       | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 4219       | FLINT | 48504 |
| 4500 N DORT HWY |  | FLINT | 533        | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 1005       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 736        | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 3001 HENRY | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 2818       | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 1107 BEARD | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 211 W      | FLINT | 48503 |

|                 |       |             |       |       |
|-----------------|-------|-------------|-------|-------|
| 4500 N DORT HWY | FLINT | 318 BEDE ST | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 2701        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 3807 N      | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 1809        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3610        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 1101 S      | FLINT | 48502 |
| 4500 N DORT HWY | FLINT | 4910        | FLINT | 48505 |
| 4500 N DORT HWY | FLINT | 6707        | FLINT | 48505 |
| 4500 N DORT HWY | FLINT | 2565        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 1920        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1221 S      | FLINT |       |
| 4500 N DORT HWY | FLINT | 714 ELLAND  | FLINT |       |
| 4500 N DORT HWY | FLINT | 924 BARRIE  | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 2820 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 422 S       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2820 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2820 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1700 S      | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 1856 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 341         | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 2820 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2820 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 801         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 225 W       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1201        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1001        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 1025        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT |             | FLINT |       |
| 4500 N DORT HWY | FLINT | 3513        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 704         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2607        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 401         | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 1939        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 2426        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 2708        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 4214        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 612 E 3RD   | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | G3139       | FLINT | 48532 |
| 4500 N DORT HWY | FLINT | 927         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 540 S       | FLINT | 48502 |
| 4500 N DORT HWY | FLINT | 3106        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 211 W       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 211 W       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 337         | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 901 W       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1305        | FLINT | 48502 |
| 4500 N DORT HWY | FLINT | 2938        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3409 SANTA  | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 3214 N      | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 360         | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 3840        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1310        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 3156        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 3200        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 1805        | FLINT | 48503 |



|                 |       |            |       |       |
|-----------------|-------|------------|-------|-------|
| 4500 N DORT HWY | FLINT | 359        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 1622 E     | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 3011 N     | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 1906 E     | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 116 W      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2302       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 929        | FLINT | 48502 |
| 4500 N DORT HWY | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1914       | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1409       | FLINT |       |
| 4500 N DORT HWY | FLINT | 2820 S     | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 325        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 726        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 502 CRAPO  | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3216       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 926        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 528 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1206       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2207 HILLS | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3014       | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 1002       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2131       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2602       | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 1651 N     | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1901 E 2ND | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3709       | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 423 S      | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3010       | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 3719 KENT  | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1830       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2250       | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 340        | FLINT |       |
| 4500 N DORT HWY | FLINT | 1106       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1025 E     | FLINT |       |
| 4500 N DORT HWY | FLINT | 2020       | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 801 FLORAL | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3110       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3901       | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 914        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 605        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 125 E      | FLINT | 48502 |
| 4500 N DORT HWY | FLINT | 2717       | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 932        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1006       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3106       | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 629        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 1001       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | UNKNOWN    | FLINT |       |
| 4500 N DORT HWY | FLINT | 1025 E     | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1602       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 535 LETA   | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 2115       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2413       | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 225 W      | FLINT | 48503 |

|                 |       |             |       |       |
|-----------------|-------|-------------|-------|-------|
| 4500 N DORT HWY | FLINT | 829         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1006 BEARD  | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2553        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2616        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 1308        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 904 E 7TH   | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1210        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1112 BEARD  | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 501 W       | FLINT |       |
| 4500 N DORT HWY | FLINT | 2309        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 311 S       | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3123        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 924         | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 913         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1728        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 514         | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 1110        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 1118        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 555         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 5602        | FLINT | 48505 |
| 4500 N DORT HWY | FLINT | 1213 BEARD  | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 218         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1126        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2721        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 719         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 725         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2925        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1820        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 2018        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 3702        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 3622        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2101        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 1310        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1422        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2430        | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 602 W       | FLINT | 48505 |
| 4500 N DORT HWY | FLINT | 1319 BEARD  | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1013 BEARD  | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2715        | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 7002        | FLINT | 48505 |
| 4500 N DORT HWY | FLINT | 705 SIMCOE  | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 3330        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 841         | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 839 W       | FLINT | 48505 |
| 4500 N DORT HWY | FLINT | 333 BEDE ST | FLINT | 48507 |
| 4500 N DORT HWY | FLINT | 3013        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 613         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2630        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 2529 N      | FLINT | 48504 |
| 4500 N DORT HWY | FLINT | 927         | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 1205        | FLINT | 48503 |
| 4500 N DORT HWY | FLINT | 3917 RED    | FLINT | 48507 |
| 4500 N DORT HWY | FLINT |             | FLINT |       |
| 4500 N DORT HWY | FLINT | 1426        | FLINT | 48506 |
| 4500 N DORT HWY | FLINT | 1329        | FLINT | 48503 |

|                 |  |       |            |       |       |
|-----------------|--|-------|------------|-------|-------|
| 4500 N DORT HWY |  | FLINT | 1112 BEARD | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 329 W      | FLINT | 48505 |
| 4500 N DORT HWY |  | FLINT | 1201       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 3120       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 721 FRANK  | FLINT | 48504 |
| 4500 N DORT HWY |  | FLINT | 1502 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | UNKNOWN    | FLINT |       |
| 4500 N DORT HWY |  | FLINT | 440 E      | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 329 W      | FLINT | 48505 |
| 4500 N DORT HWY |  | FLINT | 1302       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 1407       | FLINT | 48504 |
| 4500 N DORT HWY |  | FLINT | 205 W      | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3200       | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 2001 N     | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 2708       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | ST JOHN    | FLINT |       |
| 4500 N DORT HWY |  | FLINT | 3613 LEITH | FLINT | 48506 |
| 4500 N DORT HWY |  | FLINT | 1614       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 3405       | FLINT |       |
| 4500 N DORT HWY |  | FLINT | 4301       | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 3822       | FLINT | 48532 |
| 4500 N DORT HWY |  | FLINT | 5838       | FLINT | 48505 |
| 4500 N DORT HWY |  | FLINT | 1623       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 1210       | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 225 W      | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2319       | FLINT | 48504 |
| 4500 N DORT HWY |  | FLINT | 318        | FLINT | 48507 |
| 4500 N DORT HWY |  | FLINT | 224        | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 1220 E     | FLINT |       |
| 4500 N DORT HWY |  | FLINT | 2540 S     | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 829 E      | FLINT | 48503 |
| 4500 N DORT HWY |  | FLINT | 2801 YALE  | FLINT | 48503 |

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, January 23, 2015 10:24 AM  
**To:** prysbym@michigan.gov  
**Subject:** FW: Flint in the Free Press

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

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**From:** Berndt, Jason (DEQ)  
**Sent:** Friday, January 23, 2015 10:23 AM  
**To:** Fisher, Brant (DEQ); Philip, Kris (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)  
**Subject:** Flint in the Free Press

I'm sure we are all aware of the issue, but Flint is on the front page of the Detroit Free Press today.

<http://www.freep.com/story/news/local/michigan/2015/01/22/water-woes-latest-hit-flint/22193291/>

Jason Berndt  
Environmental Quality Analyst  
Office of Drinking Water and Municipal Assistance  
Gaylord Field Office  
~~517-284-6513~~  
989-705-3420

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, May 02, 2013 8:11 AM  
**To:** Thelen, Mary Beth (DEQ)  
**Cc:** Shekter Smith, Liane (DEQ); prysbym@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov); Jon Bloemker P.E. (BLOEMKERJ@michigan.gov)  
**Subject:** FW: Flint KWA Information  
**Attachments:** Final KWA Decision.05.01.13.pdf

FYI.

I'm not sure who all the attached was distributed to so I am forwarding it just in case.

Also, below are the linked articles from Mlive.

[http://www.mlive.com/news/flint/index.ssf/2013/05/flint\\_emergency\\_manager\\_says\\_n.html](http://www.mlive.com/news/flint/index.ssf/2013/05/flint_emergency_manager_says_n.html)

[http://www.mlive.com/news/flint/index.ssf/2013/04/spokesman\\_for\\_gov\\_rick\\_snyder.html?utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed%3A+flint\\_journal\\_news+\(Flint+Journal+News+-+MLive.co](http://www.mlive.com/news/flint/index.ssf/2013/04/spokesman_for_gov_rick_snyder.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+flint_journal_news+(Flint+Journal+News+-+MLive.co)

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Kevin Sylvester [mailto:K\_SYLVESTER@gcdcwws.com]  
**Sent:** Wednesday, May 01, 2013 3:58 PM  
**To:** Kevin Sylvester  
**Subject:** Flint KWA Information

For those not able to attend the press conference today, attached is some information regarding Flint's decision to reject DWSD's final offer and instead partner with KWA.

If you need further information or have any questions please let me know.

Regards,

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Kevin A. Sylvester  
 Communications Director  
 Genesee County Drain Commissioner's Office  
[ksylvester@gcdcwws.com](mailto:ksylvester@gcdcwws.com)  
 810-701-6514 - Mobile

**GENESEE COUNTY DRAIN COMMISSIONER'S OFFICE**

JEFFREY WRIGHT

COMMISSIONER

G-4608 BEECHER ROAD, FLINT, MI 48532

PHONE (810) 732-1590 FAX (810) 732-1474



May 1, 2013

To All Interested Parties:

As announced earlier this week by Governor Snyder's office, the City of Flint confirmed in a press conference today that they are rejecting the final offer submitted by DWSD, and are moving forward as a partner with KWA.

The decision for Flint to receive its' drinking water from KWA has now been vetted by the Department of Treasury, Department of Agriculture, and Department of Environmental Quality (DEQ).

Attached are documents relating to the decision, providing reasoning to why KWA is the best financial option for both Flint and Genesee County. Construction is expected to begin in late May or early June.

If you have any questions pertaining to this issue, please feel free to contact me at [ksylvester@gcdcwws.com](mailto:ksylvester@gcdcwws.com) or 810-701-6514.

Regards,

Kevin A. Sylvester  
Communications Director  
Genesee County Drain Commissioner's Office



## **EM Press Briefing For Week of 5/01/2013**



### **KWA vs. DWSD Facts & Figures**

- The Karegnondi Water Authority (KWA) is regional water authority that would provide raw water to Flint and Genesee County via a direct pipeline.
- This offer has more risk involved than previous proposals. KWA would be responsible for between 20% and 100% of the repair costs on the pipeline and related assets from Port Huron
- The numbers in the offer do not make sense. DWSD indicates savings of over \$900 million while KWA's total cost over 30 years is less than \$650 million.
- Offer is based on very little capital improvements, no repairs and a 4.7% annual increase over the life of the contract.
- There are no rate guarantees after the first year for capital, O & M or consumption.
- KWA would be responsible for redundancy at a cost of \$94.68 million per DWSD's estimate.
- Does not guarantee a rate structure if system regionalizes or DWSD regionalizes, or Detroit enters bankruptcy.
- Flint and Genesee County could have a connected waste/water system that serves all or part of five counties.
- The potential for further consolidation of services between the city and the county i.e...water, wastewater, 911, etc,
- This partnership will give Flint ownership of the city's own water supply system with real representation on its board of directors, making all treatment and delivery system decisions.
- Flint's participation allows the city to utilize its own water treatment facility that it has invested \$50 million into and only currently exercises four weeks per year.
- The investment gives Flint and Genesee County a new pipeline with a life expectancy of 75 years, as well as a 2<sup>nd</sup> product, untreated water. Under DWSD we would have no ownership after the end of the contract, and a new pipeline would still need to be built.



## **EM Press Briefing For Week of 5/01/2013**



- A 30 year contract with DWSD keeps Flint and Genesee County on a system that is 48 years old with a design life of 75 years. There will be necessary major investments or replacement costs that are not accounted for in this DWSD proposal.
- KWA guarantees its capitol rate for 25 years. The capitol rate is 90 % of the total costs.
- The commodity charge of \$1.30 per MCF is mainly driven by energy costs. The whole operation will employ 5-7 people.
- A thirty year contract with DWSD will lock Flint into hundreds of employees, labor costs and legacy costs.
- The combination of low financing, labor and material make this the optimal time for this investment. At our meeting with the governor on April 19<sup>th</sup> Detroit acknowledged a second pipeline had to be built.
- KWA could be used as a backup emergency supply for the existing 48 year old pipeline.
- It brings a total economic package to our community i.e. We have the I-69 corridor, I-75 interchange, the rail system connected to Port Huron, and one of the busiest airports in the state. Owning our own water supply completes that package and keeps \$25 million in our community.
- Mr. Fausone's continued insistence on a 12 month timeline to calculate the termination fees leaves a question mark on the costs.





## EM Press Briefing For Week of 5/01/2013



### Construction Costs

- Rowe/AECOM/J & H \$272,000,000
- TYJT \$357,000,000

Include: 10% bond coverage (dispelled)

30% additional engineering (dispelled)

Back-up power (dispelled)

- DWSD Starts at: \$357,000,000 and adds:

\$134,360,000 for bond sizing

\$11,074,500 for bond sale cost

For a total of \$503,274,500

Plus need to collect \$6,984,000 per year extra for bond coverage 20%)

### Now KWA needs:

20% bond coverage

30% additional engineering

38% bond sizing

The KWA dispelled TYJT's numbers; now DWSD starts with those numbers and adds more. They add the same costs to Flint and GCDC construction costs (baseline figures and assumptions – KWA).

## Baseline Figures and Assumptions - KWA Scenario

| DWSD Water Rate Structure |         |           |
|---------------------------|---------|-----------|
| Fixed                     | Standby | Commodity |

2014 738,006 #N/A 13.01 Service ceases after 2016

Total Water Service Costs for Flint / Genesee County Drain Commission  
Costs of Current Facilities / Operations

Same as DWSD scenario

Costs of Future Facilities / Operations

|                                             | Flint WTP<br>Improvements | GCDC WTP<br>and Other | KWA<br>System (a) |
|---------------------------------------------|---------------------------|-----------------------|-------------------|
| <u>Financing Costs for New Projects</u>     |                           |                       |                   |
| Project Cost                                | 7,100,000                 | 110,038,554           | 357,578,060       |
| Bond Sizing Factor                          | 37.65%                    | 37.65%                | 37.65%            |
| Additional Bond Proceeds Needed             | 2,670,000                 | 41,430,000            | 134,630,000       |
| Bond Sale Size                              | 9,800,000                 | 151,500,000           | 492,200,000       |
| Bond Issuance Expenses - %                  | 2.25%                     | 2.25%                 | 2.25%             |
| Bond Issuance Expenses                      | 220,500                   | 3,408,800             | 11,074,500        |
| Finance Rate                                | 5.00%                     | 5.00%                 | 5.00%             |
| Finance Term                                | 25                        | 25                    | 25                |
| Bond Reserve Size - %                       | 10.00%                    | 10.00%                | 10.00%            |
| Bond Reserve Size                           | 980,000                   | 15,150,000            | 49,220,000        |
| Capitalized Interest term - years           | 3                         | 3                     | 3                 |
| Capitalized Interest                        | 1,470,000                 | 22,725,000            | 73,830,000        |
| Net Bond Proceeds                           | 7,129,500                 | 110,216,200           | 358,075,500       |
| Annual Debt Service Payment                 | 695,300                   | 10,749,300            | 34,922,800        |
| Debt Service Coverage Requirement           | 120.00%                   | 120.00%               | 120.00%           |
| Annual Debt Service Coverage                | 139,100                   | 2,149,900             | 6,984,600         |
| Replacement?                                | 144,900                   | 2,251,600             | (b)               |
| Total Capital Financing Revenue Req'd       | 979,300                   | 15,150,800            | 41,907,400        |
| Operating Cost Estimate Starting in FY 2017 | 8,270,000                 | 1,819,900             | (c)               |

(a) excludes raw water reservoir

(b) assume no annual replacement required for pipeline

(c) \$1.30 per Mcf inflated to 2017

# KWA Construction

## Cost Comparison

| Description                               | KWA Estimate          | TYJT Estimate         |
|-------------------------------------------|-----------------------|-----------------------|
| Intake/Crib                               | \$ 27,596,063         | \$ 27,596,063         |
| Pump Stations                             | \$ 30,772,600         | \$ 71,042,808         |
| Transmission Mains                        | \$ 207,752,895        | \$ 217,645,389        |
| Power                                     | \$ 4,000,000          | \$ 4,000,000          |
| Redundant Power for PS                    |                       | \$ 1,273,200          |
| Land for LHPS                             | \$ 2,300,000          | \$ 2,300,000          |
| Design Engineering/PS and<br>Transmission |                       | \$ 16,939,581         |
| Construction Management                   |                       | \$ 14,434,410         |
| Administration                            |                       | \$ 349,440            |
| Legal/Easement/Contract<br>Documents      |                       | \$ 831,000            |
| Easements                                 |                       | \$ 1,166,170          |
| <b>Total</b>                              | <b>\$ 272,421,558</b> | <b>\$ 357,578,060</b> |
| <b>Flint Share @30%</b>                   | <b>\$81,726,467</b>   | <b>\$107,273,418</b>  |

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, October 15, 2014 4:31 PM  
**To:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; 'Wyant, Dan (DEQ) (WyantD@michigan.gov)'; Sygo, Jim (DEQ); Howes, Sarah (DEQ)  
**Cc:** prysbym@michigan.gov; Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Flint Main Break and Valve replacement  
**Attachments:** Robert T main break and valve replacement notice.pdf; Utility Repairs\_Dort Hwy Oct 18 2014.pdf

FYI. The City of Flint is doing some major repair work this weekend as indicated in the attached information. Customers in the affected area are being notified by the City that they may temporarily lose service and that when service is restored should boil their water until the City can verify that the line was properly disinfected through bacteria monitoring results. This protocol follows normal construction repair standards.

To be clear this advisory is not based on any confirmed contamination, but a standard precautionary measure as part of normal construction and repair work.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Daugherty Johnson [mailto:djohnson@cityofflint.com]  
**Sent:** Wednesday, October 15, 2014 4:11 PM  
**To:** Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Cc:** Brent Wright; Robert Bincsik  
**Subject:** Re: Main Break and Valve replacement

I have attached the maps and press release we are sending out. The hand drawn is internal info. Please send comments as necessary.

Thanks  
 Duffy

On Wed, Oct 15, 2014 at 3:06 PM, Daugherty Johnson <djohnson@cityofflint.com> wrote:  
 Hello Steve and Mike. The City is planning on repairing a break on a 16" line on Saturday. The shutdown area will also allow us to replace a 24" valve, 18" valve and two 12" valves. We are planning to issue a Boil Notice for the affected areas. Could you please get back with me so we can coordinate what we've got going with your office. You can call me at (810) 577-8906 to set up a conference call.

Thanks  
 Daugherty 'Duffy' Johnson  
 Utilities Administrator  
 City of Flint



CITY OF FLINT  
OFFICE OF EMERGENCY MANAGER  
DARNELL EARLEY  
ICMA-CM, MPA

Jason Lorenz  
Public Information Officer  
(810) 237-2039  
jlorenz@cityofflint.com

**For Immediate Release**

**Major Water Line Repairs Will Take Place in Robert T. Longway Blvd & Dort Hwy. Area, More Repairs to System Scheduled**

*Flint, Michigan – October 15, 2014* – The City of Flint's Department of Public Works has today announced that work on a water main break in the area of Dort and Longway is taking place and will be followed by more scheduled repairs to the system in that area. A break in the sixteen inch water main was discovered a week ago and crews have been examining the surrounding system. As a result, a number of valves in the area have been identified for repairs which will begin on Saturday, October 18, 2014.

This work will be on a part of the City's water transmission system, to which no residential customers are connected. However, there will be a reduction of pressure to the system, which may cause low water pressure in the surrounding area. In accordance with DEQ regulations we will be issuing a Boil Water Notice for the highlighted area (see attached map). Only residents who have low pressure during this 12 hour period are affected. Once again, this is merely a precaution and no one in the affected area should be directly connected to the portion of the system being repaired.

–CONTINUE–

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City Hall  
1101 S. Saginaw Street - Flint, Michigan 48502  
810-766-7346 FAX: 810-766-7218 [www.cityofflint.com](http://www.cityofflint.com)

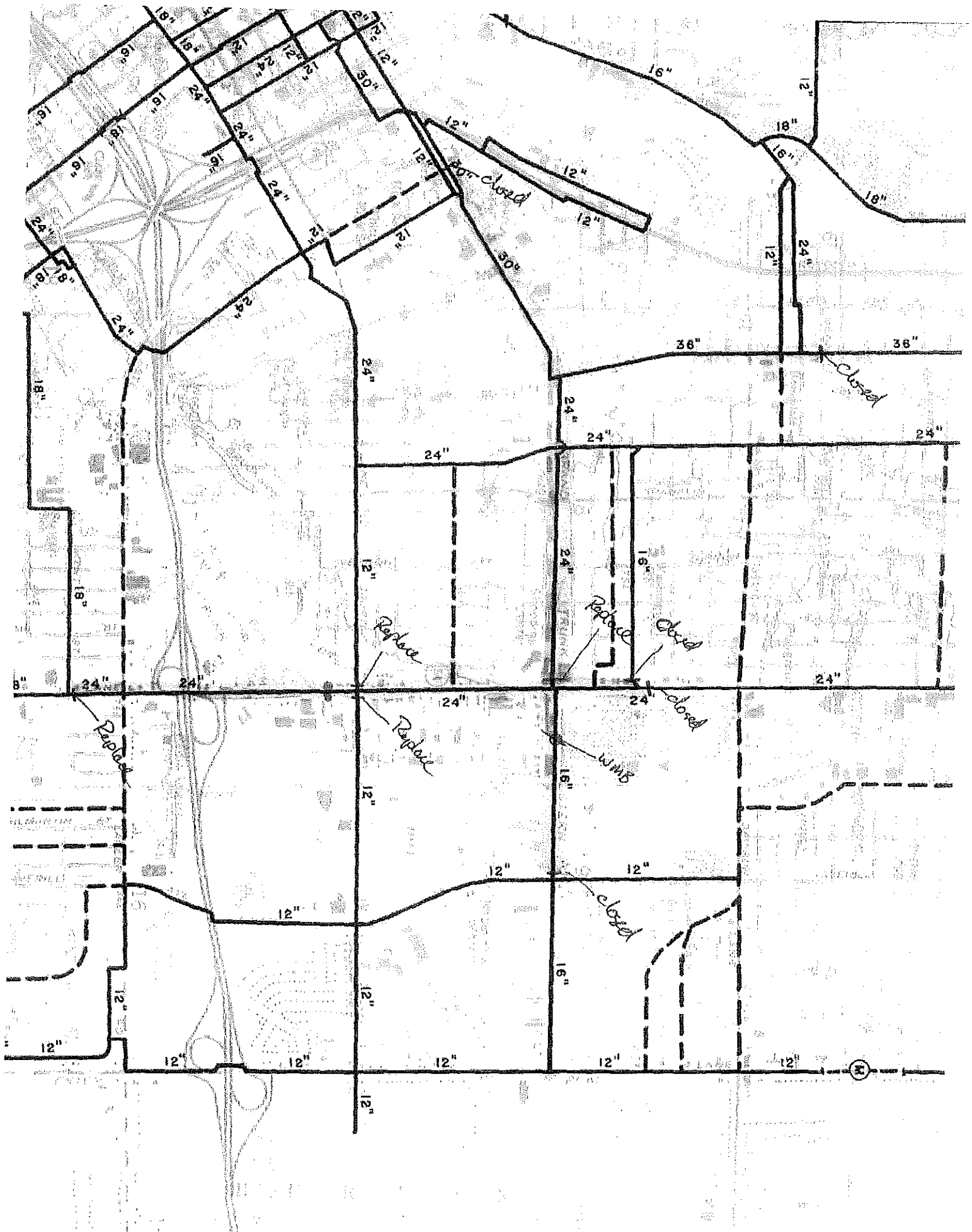


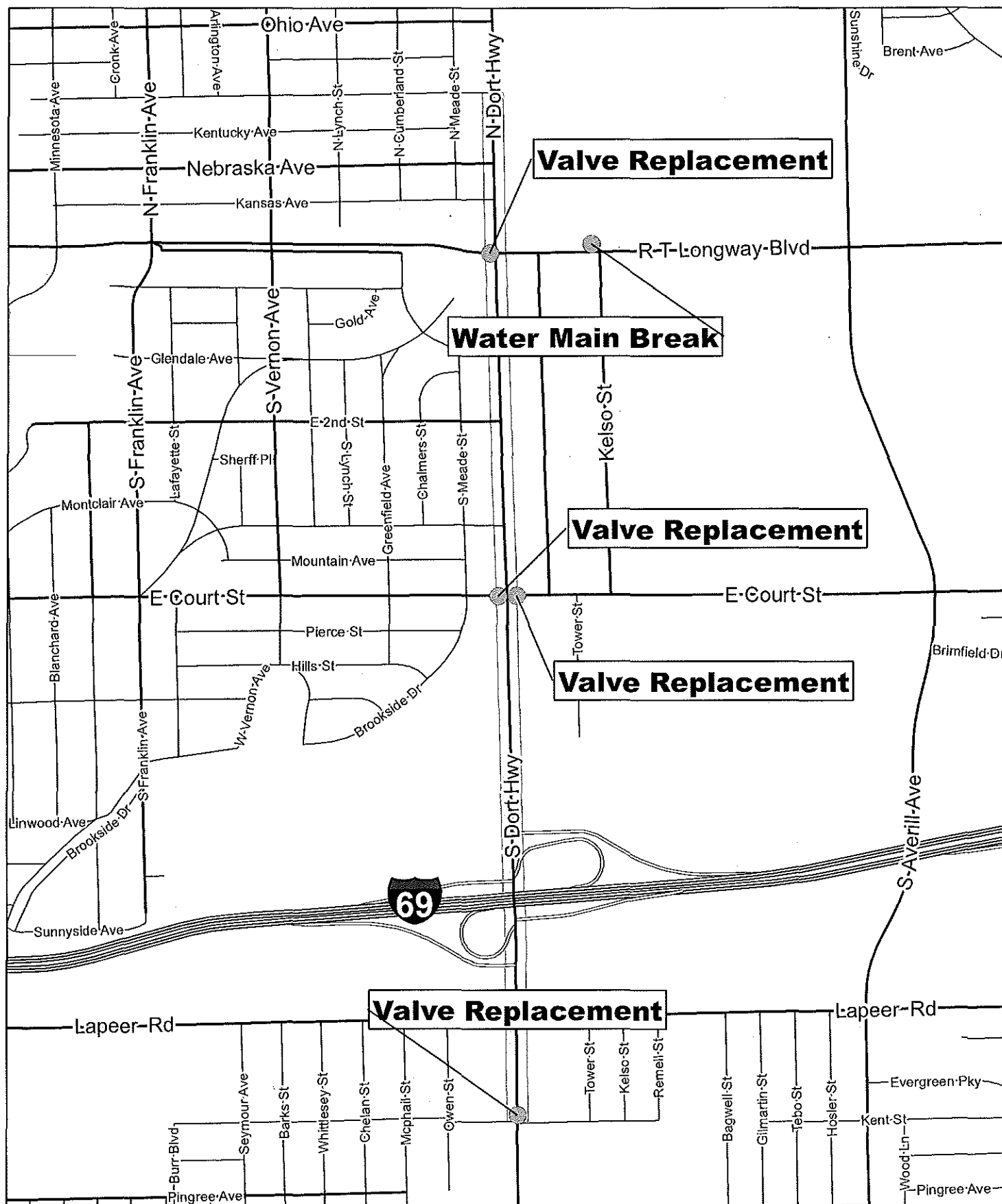
CITY OF FLINT  
OFFICE OF EMERGENCY MANAGER  
DARNELL EARLEY  
ICMA-CM, MPA

In the unlikely event that any residents in the area should experience a loss of water or low pressure during the repairs Saturday, they should expect to boil water for 48 hours after service is restored based on testing. Low pressure and discoloration may occur for those affected. The City of Flint asks that residents watch their local news station for announcement of the completion of repairs.

The work being performed will result in improved operational control over our large transmission line down Dort Hwy. which will include improving chlorine residuals in the southern portion of Flint. All of the scheduled work taking place is part of an ongoing, broader plan to examine different sections of the water system citywide for needed repairs and upgrades. Upgrading critical infrastructure such as the water system is a key part of the City's Strategic Plan.

—END—





1 in = 944 ft

0 500 1,000 2,000 3,000 Feet



Date: 10/15/2014



**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, January 26, 2015 1:42 PM  
**To:** prysbym@michigan.gov  
**Subject:** FW: Flint Mayor request to Governor regarding Flint Water  
**Attachments:** Flint Mayor Letter to Governor.pdf

See attached letter.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 21, 2015 10:50 AM  
**To:** Shekter Smith, Liane (DEQ); Wurfel, Brad (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ); Sygo, Jim (DEQ)  
**Subject:** RE: Flint Mayor request to Governor regarding Flint Water

Copy attached.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Wednesday, January 21, 2015 10:41 AM  
**To:** Wurfel, Brad (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ); Sygo, Jim (DEQ)  
**Subject:** RE: Flint Mayor request to Governor regarding Flint Water

First I heard about the letter was on NPR this morning.

---

**From:** Wurfel, Brad (DEQ)  
**Sent:** Wednesday, January 21, 2015 10:39 AM  
**To:** Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ); Sygo, Jim (DEQ)  
**Subject:** RE: Flint Mayor request to Governor regarding Flint Water

Ooops. Thanks.

Need a copy of the letter if we have it. Want to make sure the Governor's office knows to send calls about this to us, and give them a quick briefing on the situation.

Thanks.

b

**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Wednesday, January 21, 2015 10:37 AM  
**To:** Wurfel, Brad (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ); Sygo, Jim (DEQ)  
**Subject:** RE: Flint Mayor request to Governor regarding Flint Water

That is the first option listed.

Changes made to date have reduced the formation of DBPs; but because of the way the standard is calculated the violation is anticipated to remain until at least late summer. However, it is difficult to predict whether the operational changes will be effective enough to address seasonal water quality changes that occur during the summer. It is possible to have a spike in August that could cause the city additional problems. But for now, all indications are that DBP levels in the distribution system are within an acceptable range.

---

**From:** Wurfel, Brad (DEQ)  
**Sent:** Wednesday, January 21, 2015 10:31 AM  
**To:** Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ); Sygo, Jim (DEQ)  
**Subject:** RE: Flint Mayor request to Governor regarding Flint Water

Would a third option be to make adjustments to the plant that address the current water supply effectively?

---

**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Wednesday, January 21, 2015 10:26 AM  
**To:** Busch, Stephen (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ); Wurfel, Brad (DEQ); Sygo, Jim (DEQ)  
**Subject:** RE: Flint Mayor request to Governor regarding Flint Water

In light of the Mayor's letter, this could be quite uncomfortable for us tonight.

Our position has always been that we do not dictate which acceptable option(s) a water supply may choose. Our responsibility is to see that operations are managed properly, regulations are met, and safe water is delivered. For example, when Flint decided to leave Detroit and operate using the River, our role wasn't to tell them our opinion; only what steps would be necessary to make the switch.

Now that there is a violation of a drinking water standard, we have been treating Flint as we would any other supply. It is up to them to propose a solution/corrective action. Our role is to determine the reasonableness of that proposal. One option available to them is to continue to use the river until the KWA source is available as long as they implement operational changes to mitigate the formation of DBPs. Another acceptable option is to return to Detroit (GLWA) until the KWA source is available. And third option could certainly be returning to GLWA permanently.

The Mayor is saying that since there is an EM, the state (Governor) has responsibility for decisions being made (not our position). It will be very important for DEQ staff to limit our discussion to our role under the Safe Drinking Water Act. Hopefully, the EM will be prepared to respond if and when the conversation veers off into this other arena.

Liane J. Shekter Smith, P.E., Chief

Office of Drinking Water and Municipal Assistance  
Michigan Department of Environmental Quality  
517-284-6543

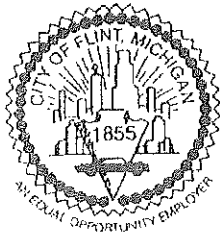
**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 21, 2015 8:41 AM  
**To:** Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ); Benzie, Richard (DEQ)  
**Cc:** Datema, Maggie (DEQ); Howes, Sarah (DEQ)  
**Subject:** Flint Mayor request to Governor regarding Flint Water

FYI. Please see the link below. The mayor of Flint has requested the state provide assistance through a number of specific initiatives.

[http://www.mlive.com/news/flint/index.ssf/2015/01/flint\\_mayor\\_asks\\_governor\\_for.html](http://www.mlive.com/news/flint/index.ssf/2015/01/flint_mayor_asks_governor_for.html)

As we are scheduled to participate in the meeting in Flint this evening please let me know if we need to further discuss these requests.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314



## CITY OF FLINT

**Dayne Walling**  
Mayor

January 18, 2015

The Honorable Rick Snyder  
Governor, State of Michigan  
P.O. Box 30013  
Lansing, MI 48909

**RE: Flint Water Improvement Plan**

Dear Governor Snyder:

On behalf of the Flint community, I am writing to convey serious concerns about water quality and to request your support for my proposed Flint Water Improvement Plan. Access to safe and clean water is a basic human right, and, therefore, policy and budget decisions need to ensure that water is affordable and secure for everyone in Flint and all across Michigan. It is essential there is City, State and Federal cooperation to address the challenges here and to meet the needs of vulnerable populations.

The Flint Water Improvement Plan is focused in five areas: safety, quality, access, investment and education. The plan puts safety and quality first because this is fundamental. It is designed to be a sustainable solution for the City of Flint and the community as we move towards a new permanent water supply from Lake Huron through the Karegnondi Water Authority. My plan offers new ideas and also builds on successful models of utility, energy and assistance programs at the State and Federal levels.

Safety & Quality

- 100% Safety is the standard
- City of Flint reports testing data to the public to assure safety and expands testing sites and frequency
- Bring on experienced river water treatment operational management in the City of Flint

Access

- Announce an amnesty program for Flint water service turn-ons and reduce the turn-on fee
- Develop a revised affordable payment plan policy to encourage customers to return
- Design Federal and State partnership to establish new Drinking Water Emergency Assistance Fund for the elderly and vulnerable families

Investment

- Accelerate water system improvements outlined in the City of Flint Capital Improvement Plan through Federal and State Investments
  - State approves City of Flint's Distressed Cities Fund applications

- Federal and State support for replacement or forgiveness of payment to the Drinking Water Revolving Loan Fund due to Flint's status as a distressed community
  - Federal and State grants for infrastructure improvements in alignment with the Flint Master Plan
- City Water Department implements budgeted FY15 projects including leak detection, valve repairs, new pipes and meter replacements

#### Education

- Develop a community partnership with universities to provide household and business customers with information on testing and conservation
- Ongoing partnership with Michigan Department of Human Services, United Way, Salvation Army and community organizations to provide information and water assistance with the Keep the Water Flowing Fund and support services
- Expand youth energy initiative to assist households with conservation and efficiency (piloted in summer 2014 with Northwestern High School students, EcoWorks and Consumers Energy)

It is also critical to restore the public confidence in Flint Water. The implementation of this plan must be accompanied by extensive community engagement including local elected officials. My objective is to work with you and your appointed officials, State Senator Ananich, State Representatives Phelps and Neeley, Congressman Kildee, community groups, businesses, churches, foundations, the Flint City Council, and all of the City of Flint and government personnel.

It is imperative that we communicate better and provide residents more information. I understand representatives from the Michigan Department of Environmental Quality will be joining a public forum this week at City Hall. This engagement going forward is vital so thank you for supporting their efforts. I think this issue of transparency is important for communities all across the State. I recommend a review of the applicable laws and policies and, at a minimum, a new requirement that water testing data be reported publicly no less than quarterly by law in all Michigan communities in Flint's population category.

Thank you for the consideration Governor. There is nothing more important in Flint right now than fixing the water problems. We must work together to identify funds to repair and update the water treatment facilities and city-wide infrastructure and to help those persons without access to clean water so that the entire Flint community has sustainable, safe, secure and affordable water now and into the future. This is an important issue for the state of our State of Michigan and I urge you to work with us to implement solutions.

Sincerely,



Dayne Walling, Mayor  
City of Flint

CC: Flint City Council President Joshua Freeman; Congressman Dan Kildee; State Senator Jim Ananich; State Representative Sheldon Neeley; State Representative Phil Phelps; Flint Emergency Manager Jerry Ambrose

**Rennaker, Joanne (DEQ)**

---

**Subject:** FW: Flint OE Status Meeting  
**Location:** LAN Office, Okemos, MI  
  
**Start:** Fri 11/7/2014 9:30 AM  
**End:** Fri 11/7/2014 12:00 PM  
**Show Time As:** Tentative  
  
**Recurrence:** (none)  
  
**Meeting Status:** Not yet responded  
  
**Organizer:** Busch, Stephen (DEQ)

Warren,

Please forward to whomever else you plan to attend the meeting next Friday. Thanks.

-----Original Appointment-----

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, October 29, 2014 2:58 PM  
**To:** Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)  
**Cc:** Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)  
**Subject:** Flint OE Status Meeting  
**When:** Friday, November 07, 2014 9:30 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).  
**Where:** LAN Office, Okemos, MI

Meeting to go over alternatives being considered by City of Flint in Operational Evaluation for TTHM.  
The meeting starts at 9:30 at LAN's office in Okemos.

Richard and Liane, I copied you for FYI, but you are welcome to come along.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, March 27, 2013 1:28 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Flint Scenarios  
**Attachments:** Flint Scenarios FY 2013-14.pdf; Recent DWSD Flint Supply Cost Options.pdf; TYJT Recommendation DWSD vs Flint.pdf; flint water supply assessment final report 2-6-13.pdf; KWA - DWSD for WRD.docx

**Importance:** High

FYI. WRD considerations.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Creal, William (DEQ)  
**Sent:** Wednesday, March 27, 2013 1:27 PM  
**To:** Sygo, Jim (DEQ); Wyant, Dan (DEQ)  
**Cc:** Busch, Stephen (DEQ); Argiroff, Phil (DEQ); Alexander, Christine (DEQ)  
**Subject:** FW: Flint Scenarios  
**Importance:** High

The attached word document includes WRD review of this situation, including what a withdrawal from the Flint River of 10 mgd would mean to NPDES dischargers.

---

**From:** Argiroff, Phil (DEQ)  
**Sent:** Wednesday, March 27, 2013 12:27 PM  
**To:** Creal, William (DEQ)  
**Cc:** Alexander, Christine (DEQ)  
**Subject:** FW: Flint Scenarios  
**Importance:** High

Bill:

Please see the attached Word write-up. It also includes the information you requested of Chris. Thanks.

-Phil

---

**From:** Creal, William (DEQ)  
**Sent:** Friday, March 22, 2013 12:24 PM  
**To:** Argiroff, Phil (DEQ)  
**Subject:** FW: Flint Scenarios  
**Importance:** High

Please take a look at this from a financial impact on DWSD – can we figure out if this will be a major hit for them?

**From:** Sygo, Jim (DEQ)  
**Sent:** Thursday, March 21, 2013 6:07 PM  
**To:** Shekter Smith, Liane (DEQ); Creal, William (DEQ)  
**Cc:** Willard, Veronica (DEQ); Smith, Laura (DEQ)  
**Subject:** FW: Flint Scenarios  
**Importance:** High

Bill and Liane,

Please have the attached documents reviewed and comments provided relative to the City of Flint water supply needs and relative to the impacts that are possible to the Detroit System.

Treasury needs an assessment as to the need for the alternative water supply and it's impacts so they can provide input to the financial managers.

We need comments by next week and will likely meet with the Director on Thursday.

Bring in whatever staff you need for the review and please try to have your assessments by Wednesday morning.

Sorry for the tight time frame but this one is out of my hands. I will also be looking at the report.

---

**From:** Wyant, Dan (DEQ)  
**Sent:** Thursday, March 21, 2013 5:10 PM  
**To:** Sygo, Jim (DEQ)  
**Cc:** Shaler, Karen (DEQ); Thelen, Mary Beth (DEQ); Wyant, Dan (DEQ)  
**Subject:** FW: Flint Scenarios  
**Importance:** High

Jim,

Director asked that you review and coordinate this with Liane Shekter Smith and/or Bill Creal and their appropriate staff. Director also asked that I schedule an internal meeting with you and staff on this for next week. After your review, please let me know who you want in the meeting. It needs to happen on Tuesday, Wednesday or Thursday of next week.

Thank you.

Mary Beth

---

**From:** Stibitz, Brom (Treasury)  
**Sent:** Thursday, March 21, 2013 5:00 PM  
**To:** Wyant, Dan (DEQ)  
**Cc:** Dillon, Andy (Treasury)  
**Subject:** FW: Flint Scenarios

Andy asked that I pass this information along to you.



Summary of FY 2013-14 DWSD Cost Allocations to Flint Under Various Scenarios  
**Flint Only**

|                                          | Revenue Requirement | Rates and Charges |           |               |
|------------------------------------------|---------------------|-------------------|-----------|---------------|
|                                          |                     | Fixed             | Commodity | Avg Unit Cost |
| 1 Status Quo ( <i>Flint Portion</i> )    | 12,574,900          | 379,304           | 13.01     | 20.39         |
| 2 Suggested Cct ( <i>Flint Portion</i> ) | 11,281,100          | 351,661           | 12.06     | 19.27         |
| 3 Change                                 | (1,293,800)         | (27,643)          | (0.95)    | (1.12)        |
| 4 % Change                               | -10.3%              | -7.3%             | -7.3%     | -5.5%         |
| 5 Max Day Only                           | 9,904,300           | 294,542           | 10.87     | 16.91         |
| 6 Change                                 | (1,376,800)         | (57,119)          | (1.19)    | (2.36)        |
| 7 % Change                               | -13.9%              | -19.4%            | -10.9%    | -14.0%        |
| 8 Add CTA Line to BP                     | 10,093,100          | 310,271           | 10.87     | 17.23         |
| 9 Change                                 | 188,800             | 15,729            | 0.00      | 0.32          |
| 10 % Change                              | 1.9%                | 5.1%              | 0.0%      | 1.9%          |
| 11 CTA to BP / Flint only to FWTP        | 12,446,300          | 506,371           | 10.87     | 21.25         |
| 12 Change                                | 2,353,200           | 196,100           | 0.00      | 4.02          |
| 13 % Change                              | 18.9%               | 38.7%             | 0.0%      | 18.9%         |
| 14 Add CTA Line to FWTP                  | 10,191,200          | 318,450           | 10.87     | 17.40         |
| 15 Change                                | (2,255,100)         | (187,921)         | 0.00      | (3.85)        |
| 16 % Change                              | -22.1%              | -59.0%            | 0.0%      | -22.1%        |
| 17 CTA to FWTP / Buy existing 72         | 10,009,600          | 303,315           | 10.87     | 17.08         |
| 18 Change                                | (181,600)           | (15,135)          | 0.00      | (0.32)        |
| 19 % Change                              | -1.8%               | -5.0%             | 0.0%      | -1.9%         |
| 20 Cumulative Change                     | (2,565,300)         | (75,989)          | (2.14)    | (3.31)        |
| 21 Cumulative % Change                   | -20.4%              | -20.0%            | -16.4%    | -16.2%        |

|                                  | Assumptions           |                       |                         |                 |                  |
|----------------------------------|-----------------------|-----------------------|-------------------------|-----------------|------------------|
|                                  | Avg Day<br><i>mgd</i> | Max Day<br><i>mgd</i> | Peak Hour<br><i>mgd</i> | DWSD Investment |                  |
|                                  |                       |                       |                         | CTA<br>\$       | Flint Only<br>\$ |
| 1 Status Quo                     | 24.6                  | 45.6                  | 47.7                    | 0               | 0                |
| 2 Suggested Contract             | 23.4                  | 40.6                  | 42.4                    | 0               | 0                |
| 3 Max Day Only                   | 12.0                  | 18.0                  | 18.0                    | 0               | 0                |
| 4 Add CTA Line to BP             | 12.0                  | 18.0                  | 18.0                    | 62,290,800      | 0                |
| 5 CTA to BP / Flint only to FWTP | 12.0                  | 18.0                  | 18.0                    | 62,290,800      | 32,391,300       |
| 6 Add CTA Line to FWTP           | 12.0                  | 18.0                  | 18.0                    | 94,682,100      | 0                |
| 7 CTA to FWTP / Buy existing 72  | 12.0                  | 18.0                  | 18.0                    | 94,682,100      | (2,500,000)      |

**TFG**

**DWSD Worksheet : 18 MGD Maximum Day Customer with Model Contract Twinning Line and Owning both to the Flint WTP**

Capacity

Flint ADD: 0.00 MGD - MCF/Day  
 DWSD ADD: 12 MGD 1,604 MCF/Day

Annual Volume

Flint: - MCF  
 DWSD: 585,561 MCF

2013 Cost of Supply

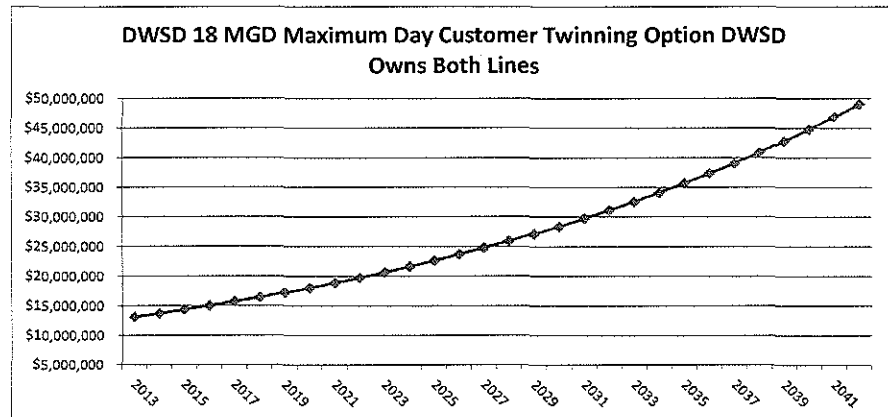
Flint WTP O&M: - /MCF \$ - /Yr  
 DWSD: \$ 17.08 /MCF \$ 10,001,390 /Yr

Escalation/Inflation Rate

Flint: 4.51% /Yr  
 DWSD: 4.7% /Yr

Capital Expenditure

Amount: \$ -  
 Reserve: \$ - 0% Reserve Rate: 0.00%  
 Amount plus Reserve: \$ -  
 Revenue Bond Rate: 5%  
 Number of Years: 25  
 Annual Cost: \$0



| Year    | Flint WTP O&M | Water Purchase | Revenue Bond Payment | Interest on Reserve | TOTAL         |
|---------|---------------|----------------|----------------------|---------------------|---------------|
| 1 2013  | \$ -          | 10,001,390     | -                    | -                   | \$ 10,001,390 |
| 2 2014  | \$ -          | 10,471,456     | -                    | -                   | \$ 10,471,456 |
| 3 2015  | \$ -          | 10,963,614     | -                    | -                   | \$ 10,963,614 |
| 4 2016  | \$ -          | 11,478,904     | -                    | -                   | \$ 11,478,904 |
| 5 2017  | \$ -          | 12,018,412     | -                    | -                   | \$ 12,018,412 |
| 6 2018  | \$ -          | 12,583,278     | -                    | -                   | \$ 12,583,278 |
| 7 2019  | \$ -          | 13,174,692     | -                    | -                   | \$ 13,174,692 |
| 8 2020  | \$ -          | 13,793,902     | -                    | -                   | \$ 13,793,902 |
| 9 2021  | \$ -          | 14,442,216     | -                    | -                   | \$ 14,442,216 |
| 10 2022 | \$ -          | 15,121,000     | -                    | -                   | \$ 15,121,000 |
| 11 2023 | \$ -          | 15,831,687     | -                    | -                   | \$ 15,831,687 |
| 12 2024 | \$ -          | 16,575,776     | -                    | -                   | \$ 16,575,776 |
| 13 2025 | \$ -          | 17,354,838     | -                    | -                   | \$ 17,354,838 |
| 14 2026 | \$ -          | 18,170,515     | -                    | -                   | \$ 18,170,515 |
| 15 2027 | \$ -          | 19,024,529     | -                    | -                   | \$ 19,024,529 |
| 16 2028 | \$ -          | 19,918,682     | -                    | -                   | \$ 19,918,682 |
| 17 2029 | \$ -          | 20,854,860     | -                    | -                   | \$ 20,854,860 |
| 18 2030 | \$ -          | 21,835,039     | -                    | -                   | \$ 21,835,039 |
| 19 2031 | \$ -          | 22,861,286     | -                    | -                   | \$ 22,861,286 |
| 20 2032 | \$ -          | 23,935,766     | -                    | -                   | \$ 23,935,766 |
| 21 2033 | \$ -          | 25,060,747     | -                    | -                   | \$ 25,060,747 |
| 22 2034 | \$ -          | 26,238,602     | -                    | -                   | \$ 26,238,602 |
| 23 2035 | \$ -          | 27,471,816     | -                    | -                   | \$ 27,471,816 |
| 24 2036 | \$ -          | 28,762,992     | -                    | -                   | \$ 28,762,992 |
| 25 2037 | \$ -          | 30,114,852     | -                    | -                   | \$ 30,114,852 |
| 2038    | \$ -          | 31,530,250     | -                    | -                   | \$ 31,530,250 |
| 2039    | \$ -          | 33,012,172     | -                    | -                   | \$ 33,012,172 |
| 2040    | \$ -          | 34,563,744     | -                    | -                   | \$ 34,563,744 |
| 2041    | \$ -          | 36,188,240     | -                    | -                   | \$ 36,188,240 |
| 2042    | \$ -          | 37,889,088     | -                    | -                   | \$ 37,889,088 |

**25 Yrs Cumulative**  
 \$ 458,060,853

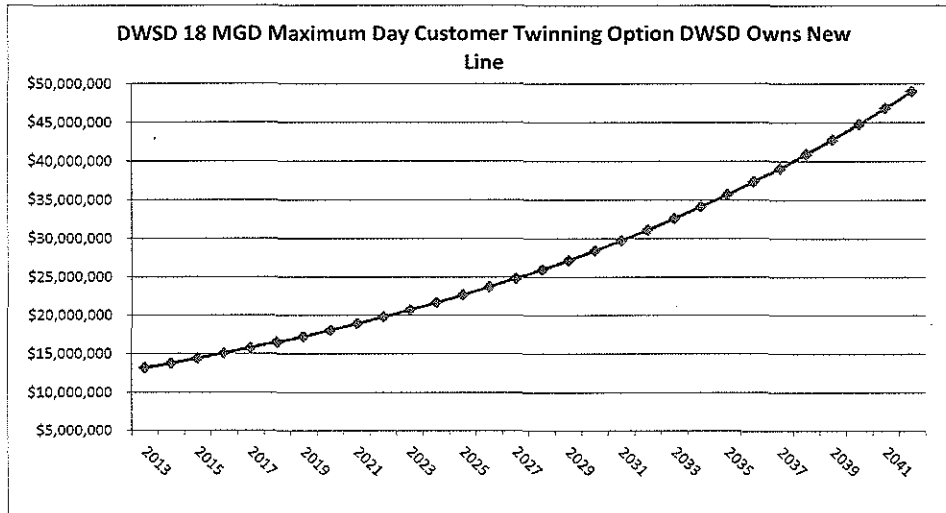
**30 Yrs Cumulative**  
 \$ 631,244,349

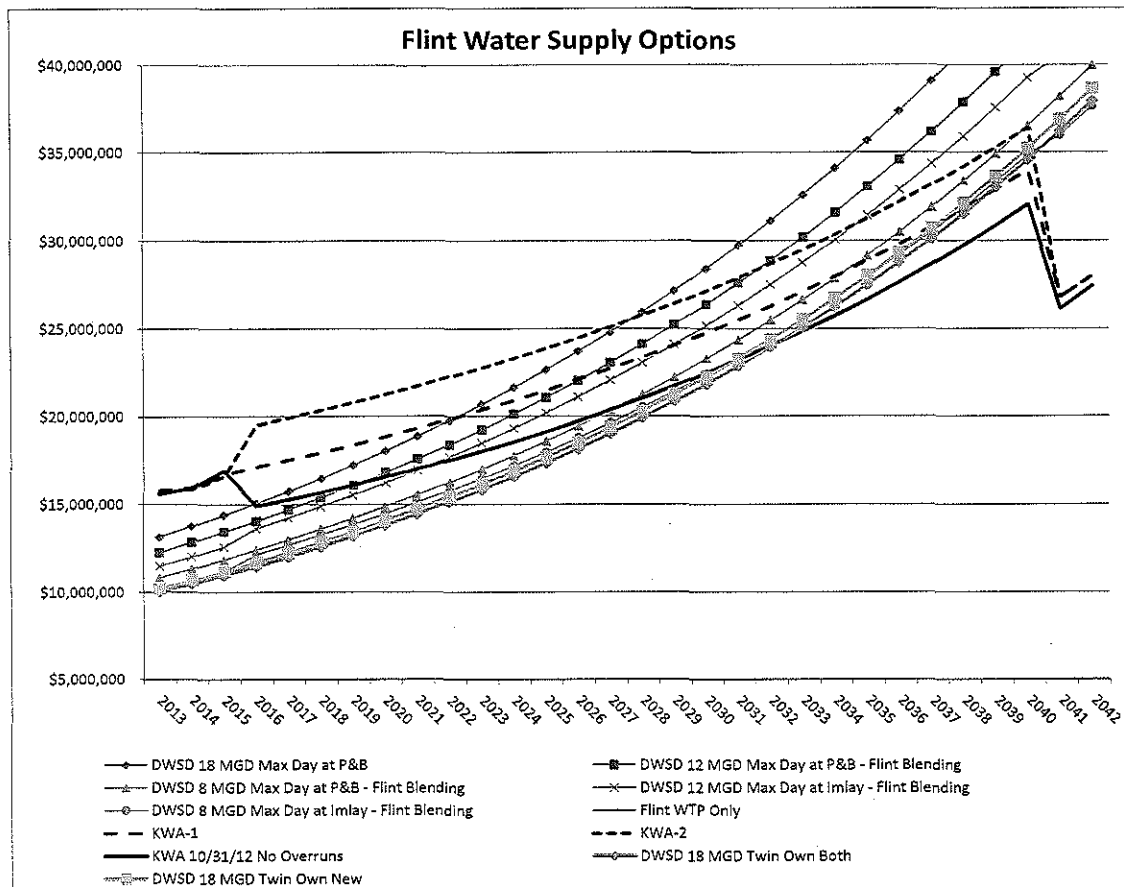
**DWSD Worksheet : 18 MGD Maximum Day Customer with Model Contract Twinning Line and Owning Only New Line to the Flint WTP**

|                                  |                         |                          |                   |      |      | Flint WTP O&M | Water Purchase | Revenue Bond Payment | Interest on Reserve | TOTAL         |
|----------------------------------|-------------------------|--------------------------|-------------------|------|------|---------------|----------------|----------------------|---------------------|---------------|
| <u>Capacity</u>                  |                         |                          |                   | Year |      |               |                |                      |                     |               |
|                                  | Flint ADD:              | 0.00 MGD                 | - MCF/Day         | 1    | 2013 | \$ -          | 10,188,770     |                      | -                   | \$ 10,188,770 |
|                                  | DWSD ADD:               | 12 MGD                   | 1,604 MCF/Day     | 2    | 2014 | \$ -          | 10,667,642     |                      | -                   | \$ 10,667,642 |
| <u>Annual Volume</u>             |                         |                          |                   | 3    | 2015 | \$ -          | 11,169,021     |                      | -                   | \$ 11,169,021 |
|                                  | Flint:                  | - MCF                    |                   | 4    | 2016 | \$ -          | 11,693,965     | -                    | -                   | \$ 11,693,965 |
|                                  | DWSD:                   | 585,561 MCF              |                   | 5    | 2017 | \$ -          | 12,243,582     | -                    | -                   | \$ 12,243,582 |
| <u>2013 Cost of Supply</u>       |                         |                          |                   | 6    | 2018 | \$ -          | 12,819,030     | -                    | -                   | \$ 12,819,030 |
|                                  | Flint WTP O&M:          | - /MCF                   | \$ - /Yr          | 7    | 2019 | \$ -          | 13,421,525     | -                    | -                   | \$ 13,421,525 |
|                                  | DWSD: \$                | 17.40 /MCF               | \$ 10,188,770 /Yr | 8    | 2020 | \$ -          | 14,052,336     | -                    | -                   | \$ 14,052,336 |
| <u>Escalation/Inflation Rate</u> |                         |                          |                   | 9    | 2021 | \$ -          | 14,712,796     | -                    | -                   | \$ 14,712,796 |
|                                  | Flint:                  | 4.51% /Yr                |                   | 10   | 2022 | \$ -          | 15,404,297     | -                    | -                   | \$ 15,404,297 |
|                                  | DWSD:                   | 4.7% /Yr                 |                   | 11   | 2023 | \$ -          | 16,128,299     | -                    | -                   | \$ 16,128,299 |
| <u>Capital Expenditure</u>       |                         |                          |                   | 12   | 2024 | \$ -          | 16,886,330     | -                    | -                   | \$ 16,886,330 |
|                                  | Amount: \$              | -                        |                   | 13   | 2025 | \$ -          | 17,679,987     | -                    | -                   | \$ 17,679,987 |
|                                  | Reserve: \$             | - 0% Reserve Rate: 0.00% |                   | 14   | 2026 | \$ -          | 18,510,946     | -                    | -                   | \$ 18,510,946 |
|                                  | Amount plus Reserve: \$ | -                        |                   | 15   | 2027 | \$ -          | 19,380,961     | -                    | -                   | \$ 19,380,961 |
|                                  | Revenue Bond Rate:      | 5%                       |                   | 16   | 2028 | \$ -          | 20,291,866     | -                    | -                   | \$ 20,291,866 |
|                                  | Number of Years:        | 25                       |                   | 17   | 2029 | \$ -          | 21,245,584     | -                    | -                   | \$ 21,245,584 |
|                                  | Annual Cost:            | \$0                      |                   | 18   | 2030 | \$ -          | 22,244,126     | -                    | -                   | \$ 22,244,126 |
|                                  |                         |                          |                   | 19   | 2031 | \$ -          | 23,289,600     | -                    | -                   | \$ 23,289,600 |
|                                  |                         |                          |                   | 20   | 2032 | \$ -          | 24,384,211     | -                    | -                   | \$ 24,384,211 |
|                                  |                         |                          |                   | 21   | 2033 | \$ -          | 25,530,269     | -                    | -                   | \$ 25,530,269 |
|                                  |                         |                          |                   | 22   | 2034 | \$ -          | 26,730,192     | -                    | -                   | \$ 26,730,192 |
|                                  |                         |                          |                   | 23   | 2035 | \$ -          | 27,986,511     | -                    | -                   | \$ 27,986,511 |
|                                  |                         |                          |                   | 24   | 2036 | \$ -          | 29,301,877     | -                    | -                   | \$ 29,301,877 |
|                                  |                         |                          |                   | 25   | 2037 | \$ -          | 30,679,065     | -                    | -                   | \$ 30,679,065 |
|                                  |                         |                          |                   |      | 2038 | \$ -          | 32,120,981     | -                    | -                   | \$ 32,120,981 |
|                                  |                         |                          |                   |      | 2039 | \$ -          | 33,630,667     | -                    | -                   | \$ 33,630,667 |
|                                  |                         |                          |                   |      | 2040 | \$ -          | 35,211,309     | -                    | -                   | \$ 35,211,309 |
|                                  |                         |                          |                   |      | 2041 | \$ -          | 36,866,240     | -                    | -                   | \$ 36,866,240 |
|                                  |                         |                          |                   |      | 2042 | \$ -          | 38,598,953     | -                    | -                   | \$ 38,598,953 |

**25 Yrs Cumulative**  
\$ 466,642,790

**30 Yrs Cumulative**  
\$ 643,070,941





| Option                        | Costs through 2042 | Ranking |
|-------------------------------|--------------------|---------|
| Flint WTP Only                | \$ 590,441,893     | 1       |
| DWSD 8 MGD Max Day at Imlay   | \$ 634,795,488     | 2       |
| KWA 10/31/12 Update           | \$ 649,775,166     | 3       |
| DWSD 8 MGD Max Day at P&B     | \$ 672,671,705     | 4       |
| KWA-1                         | \$ 707,279,715     | 5       |
| DWSD 12 MGD Max Day at Imlay  | \$ 725,576,803     | 6       |
| DWSD 12 MGD Max Day at P&B    | \$ 762,110,308     | 7       |
| KWA-2                         | \$ 766,784,313     | 8       |
| DWSD 18 MGD Max Day at P&B    | \$ 821,226,268     | 9       |
| DWSD 18 MGD Max Twin Own Both | \$ 631,244,349     |         |
| DWSD 18 MGD Max Own New Line  | \$ 643,070,941     |         |

**STATE OF MICHIGAN CONTRACT NO. 271N3200089****CITY OF FLINT WATER SUPPLY ASSESSMENT**

At the request of the Treasurer, Tucker, Young, Jackson, Tull, Inc. (TYJT) makes the following recommendation to the Department of Treasury concerning Flint's water supply alternatives. Based on the financial analysis performed of the various options presented by DWSD to continue treated water service to Flint compared to Flint being supplied by the new KWA untreated water system, TYJT believes that several of the options presented by DWSD are lower in cost currently and over the long run than the one offered by KWA. TYJT also believes that DWSD's most recent offer (subsequent to the submittal of our report) to build a smaller parallel water main from Imlay to Flint, funded by the entire DWSD base of customers, is the best solution offering the least cost alternative and the required redundancy by MDEQ.

Furthermore, since a majority of the KWA system has not been designed and none of the system has been constructed, there is an additional risk that the cost of the KWA system may actually be higher than estimated due to potential construction delays and unforeseen conditions. This risk to Flint could be substantial since the city is responsible for 30 percent of the KWA design and construction costs while still having to purchase water from DWSD during the construction period.

Finally, there are other issues that were identified in our report that may result in risks to Flint if it were to join KWA that should be considered by the Treasury in determining how Flint's potable water should be supplied. These issues are related to redundancy and reliability, other items affecting cost, and Flint's desire to control its own destiny related to its water supply. These are described further below.

- DWSD's supply to Flint is via a 72-inch water main from Imlay City. This main also supplies Imlay City, Mayfield and the Greater Lapeer County Utilities Authority (GLCUA). The volume of water contained within the 72-inch main is approximately 30 million gallons. If Genesee and Flint move to KWA then the three remaining communities' consumption would most likely not be large enough to maintain fresh water in DWSD's pipeline (due to loss of chlorine residual). DWSD may consider shutting down the 72-inch line completely due to the water quality concerns, which would then create an additional burden for Imlay, Mayfield and GLCUA to finance treated water supplies.
- The KWA supply option is counter to the Treasury's Competitive Grant Assistance Program (Formerly EVIP Grant). This program has been put in place to allow for communities to consolidate their services and save money. Two existing customers of DWSD (Flint and Genesee County) along with the potential of others customers (GLCUA, Mayfield, Imlay City) separating from another water system is in contradiction to the program.
- There is a concern over the ability of smaller systems (KWA) over larger systems (DWSD) to pay for future unfunded mandates and regulations. Obviously, identifying regulation requirements over 30 years is hard to determine. However, it is widely accepted that a large system has greater ability to respond to unfunded mandates because the cost can be distributed over a large customer base.
- Although Flint will be responsible for 30 percent of the construction cost, they will only have a minority vote on the KWA board. Furthermore, there are other communities (Lapeer County, the City of Lapeer, and Sanilac County) that sit on the board and vote. However, they are not purchasing water nor contributing to the construction costs. Their position on the KWA Board will not provide them an ability to "control their own destiny," as they have stated to the Treasury.

---

**STATE OF MICHIGAN CONTRACT NO. 271N3200089**

**CITY OF FLINT WATER SUPPLY ASSESSMENT**  
**February 2013**

For Submittal to:  
**State of Michigan, Department of Treasury**



Submitted by:

**TY** TUCKER, YOUNG,  
**JC** JACKSON, TULL INC.

CONSULTING ENGINEERS-PLANNERS  
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## ***Appendices***

Appendices A – Meeting Minutes

Appendix B – Cost Worksheets



## ***1. INTRODUCTION***

Tucker, Young, Jackson, Tull, Inc. (TYJT), at the request of the State Treasurer performed an analysis of the water supply options being considered by the City of Flint. The City of Flint is presently supplied potable water from the Detroit Water and Sewerage Department (DWSD). This supply is from a single 72-inch water main that terminates at a master meter located at Potter and Baxter. Additionally, downstream of the DWSD master meter, Flint supplies its customer Genesee County. The City of Flint also operates a water treatment plant that uses the Flint River as its source of supply to provide back up and redundancy to the DWSD supply as required by MDEQ.

The Karegnondi Water Authority (KWA) is planning on constructing a raw water supply system that could provide Lake Huron water to the Flint Water Treatment Plant. Flint's existing plant would be upgraded to treat the new raw water source.

The State Treasurer has appointed an emergency financial manager for the City of Flint. As such the Treasurer has requested TYJT to provide an analysis of the water supply options to assist the Treasurer in determining any potential risk and the best course going forward for supplying potable water to the City of Flint.

### ***Report Organization***

The following sections of this report are described below:

Section 2 – The basis of the analysis is described in this section. The options include the KWA option and several options offered by DWSD.

Section 3 – A significant amount of information and data was collected including memorandums, reports, drawings, financial reports, and other documents. This section summarizes the information used in the analysis.

Section 4 – This section describes the evaluation of the cost of supply for the Flint options. The costs are comprised of the initial cost of operations plus the annual rate of escalation/inflation.

Section 5 – The evaluation process used to analyze the construction costs associated with the KWA supply system is described in this section. Additionally, the cost of financing the capital requirements is described.

Section 6 – This section presents the financial review of the options considered to supply potable water to Flint. A summary of these options is also provided.

Section 7 – In addition to the financial analysis other considerations were identified that should be considered in understanding the risks and determining the best option to supply Flint. They include items related to cost, redundancy and reliability, and Flint's ability to control their future cost of water supply.

## ***2. FLINT WATER SUPPLY OPTIONS***

Two water purveyor options were evaluated; the KWA water supply system and continued supply from DWSD. Both suppliers would provide water from Lake Huron as the source. The KWA system is a raw water supply, which means that the water would have to be treated by Flint before distributing the potable water to its customers. The DWSD supply is potable or “finished” water and would not need additional treatment.

Additionally, an option for the Flint WTP to supply the City of Flint without being supplied from either DWSD or KWA was initially considered. The preliminary investigation evaluated the cost associated with the required improvements to the plant and to the Flint River dam system. Although it appeared that this was a viable option, Flint in a meeting on December 20, 2012 with the Treasury, stated that the City did not want to pursue the option and it is no longer being considered.

### ***Karegnondi Water Authority (KWA) Lake Huron Water Supply***

The KWA water supply system schematic is shown in Figure 2-1. The system is comprised of an intake in Lake Huron that supplies water to the Lake Huron Pump Station (LHPS). The LHPS lifts the water and pumps it through an approximately 22 mile long 60-inch pipeline. The pipeline terminates at a 5 MG reservoir and is then pumped from the Intermediate Pump Station (IPS) through approximately 26 miles of 60-inch and 18 miles of 30-inch pipeline to the existing Flint WTP. Downstream of the IPS, approximately half way to the Flint WTP, the 60-inch line would also supply a new Genesee County WTP.

The raw water transmission system has a 60 MGD capacity and is sized to deliver a maximum of 18 MGD to the Flint WTP with an average day supply of 12 MGD. Improvements at the Flint WTP would also be required to treat the lake water as the plant is currently designed to treat the Flint River water.

The term of the KWA contract for Flint is 40 years.

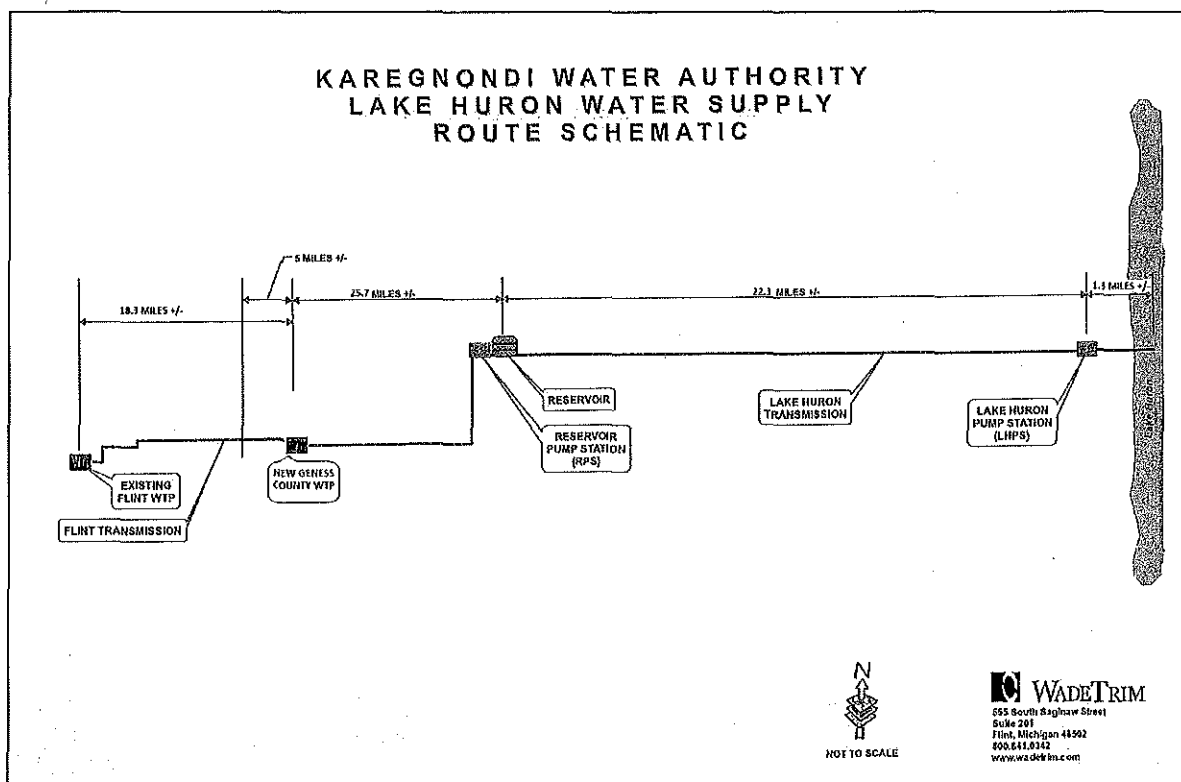


**Figure 2-1: KWA Raw Water System**

### ***DWSD Water System***

The DWSD system schematic is shown in Figure 2-2. Flint is currently supplied by DWSD at Master Meter FL-1, located at Potter and Baxter. Flint typically gets its water from the Lake Huron WTP, located in Fort Gratiot, Michigan; near the Lake Huron shoreline. Water is treated and pumped at the Lake Huron WTP and supplied through a 120-inch pipeline to an intermediate pump station called the Imlay Pump Station. The Imlay Pump Station has 20 MG of reservoir capacity. Depending on the time of year and the DWSD system demand, water is either bypassed directly to Flint or it is re-pumped at Imlay. It should be noted that the DWSD supply to Flint is part of a very large water system and during emergencies or outages water can be supplied from the south up to Flint in lieu of the Lake Huron facility.

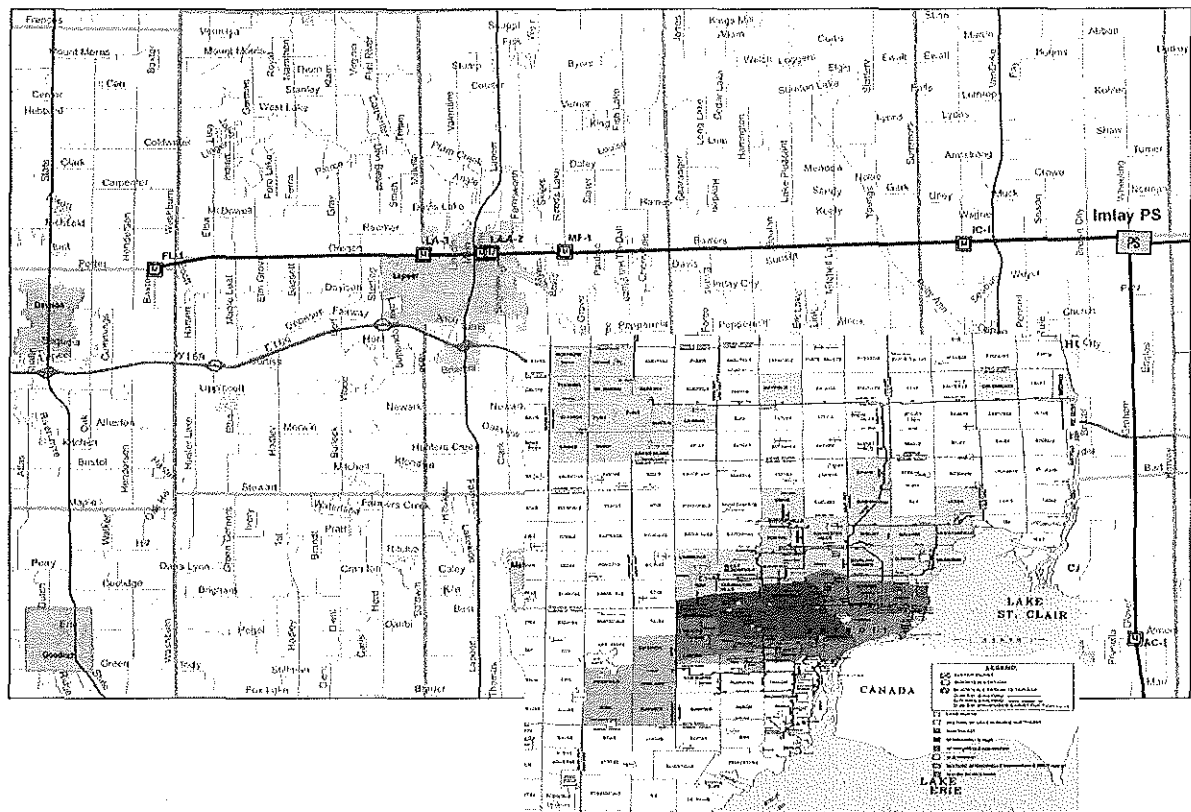


**Figure 2-2: DWSD Water System**

The pipeline from Imlay to FL-1 is a 72-inch pipeline. It has been estimated that the 72-inch line serving Flint has a capacity in excess of 90 MGD.

DWSD has presented several contractual options to Flint and all of them are based on Flint signing a new 30 year contract. The options shown in Table 2-1 are based on two different supply points; one at the current master meter location FL-1 at Potter and Baxter (P&B) and the other at the location of the Imlay Pump Station. The reason for the varying options is to provide a lower water rate at the Imlay Station, since the DWSD rate formula is based on distance and elevation factors related to the supply location.

The rates are also dependent on the maximum amount of water DWSD supplies. As example, if DWSD supplies a maximum day demand of 18 MGD that would equal the entire amount of water required by Flint.

For the options less than the maximum of 18 MGD means that the Flint WTP would supplement the difference by supplying water treated from the Flint River. These options are known as "blending" and would allow for Flint to blend two sources of water to supply its customers; the Flint River using the Flint WTP and Lake Huron from DWSD system.

| Description                         | Average Day Demand |
|-------------------------------------|--------------------|
| 18 MGD Maximum Day Customer – FL-1  | 12 MGD             |
| 12 MGD Maximum Day Customer – FL-1  | 8 MGD              |
| 8 MGD Maximum Day Customer – FL-1   | 8 MGD              |
| 12 MGD Maximum Day Customer - Imlay | 12 MGD             |
| 8 MGD Maximum Day Customer - Imlay  | 12 MGD             |

**Table 2-1: DWSD Supply Options**

### ***3. DATA COLLECTION***

During the course of the investigation several documents were used to perform the analysis. The names of the documents are listed below for reference.

#### KWA and Flint

- Preliminary Engineering Report, Lake Huron Water Supply Karegnondi Water Authority, September 2009;
- Analysis of the Flint River as a Permanent Water Supply for the City of Flint, July 2011;
- Cost Comparison, KWA vs. DWSD, Letter to Mr. Kurtz, October 31, 2012;
- Lake Huron Supply Study, KWA, Appendix 20, October 2012 Preliminary Report Update, Final Report (DRAFT), October 4, 2012;
- Articles of Incorporation of Karegnondi Water Authority, endorsed in 2010;
- Karegnondi Water Authority Bylaws, October 26, 2010;
- KWA Raw Water Supply Contract;
- Flint WTP Statement of Revenues and Expenditures 09' – 12';
- GCDC Division of Water and Waste Services Financial Statements 03' – 11'; and
- Assorted emails with further clarification of questions and documentation.

#### DWSD

- Historical Rates and Charges to Flint 04' – 13';
- Historical Rates and Charges to Flint with Hypothetical Model Contract 10' – 13';
- 2013 Rates and Charges for the following options:
  - 18 MGD Maximum Day Customer at FL-1;
  - 12 MGD Maximum Day Customer at FL-1 (Flint blending\*);
  - 8 MGD Maximum Day Customer at FL-1 (Flint blending\*);
  - 12 MGD Maximum Day Customer at Imlay (Flint blending\*);
  - 8 MGD Maximum Day Customer at Imlay (Flint blending\*); and
- Assorted emails with further clarification of questions and documentation.

- \* Flint blending based on DWSD supplying two-thirds and Flint one-third of 12 MGD average day demand.

Two meetings were also held; one with DWSD and one with Flint and Genesee County representing KWA. The meetings were held on November 19, 2012 and November 20, 2012, respectively. Minutes from these meetings are included in Appendix A.

#### 4. COST OF SERVICE

Information provided by DWSD, Flint, and representatives of the KWA were used in the cost of service evaluation. To evaluate the annual escalation/inflation rate over the planning period, the rate adjustment for DWSD was estimated based on the recent rate adjustment history. For the KWA system both the estimated cost of operations when the system begins supplying water and the annual rate adjustment or inflation was evaluated. The existing cost of operations and escalation for the Flint WTP was based on actual costs provided and then adjusted depending on the scenario considered. This section describes the evaluation process and the rates used in the analysis.

##### *DWSD Water Supply*

The City of Flint has been a customer of DWSD since 1967. The Flint WTP has been maintained as a backup to the DWSD system. As indicated previously, several options were provided by DWSD depending on the type of service Flint was to select. The unit cost of water for each of these options is shown in Table 4-1. These rates are based on DWSD's FY13, which are current until July 2013.

| Description                         | Average Day Demand (MGD) | Unit Rate (\$/MCF) |
|-------------------------------------|--------------------------|--------------------|
| 18 MGD Maximum Day Customer – FL-1  | 12                       | 16.37              |
| 12 MGD Maximum Day Customer – FL-1  | 8                        | 16.31              |
| 8 MGD Maximum Day Customer – FL-1   | 8                        | 12.68              |
| 12 MGD Maximum Day Customer - Imlay | 12                       | 14.38              |
| 8 MGD Maximum Day Customer - Imlay  | 12                       | 11.11              |

**Table 4-1: Cost of DWSD Supply Options**

To determine annual escalation rate, DWSD's last 10 years of history was used along with other large urban water systems in Michigan. The water systems used for benchmarking comparison were: Lansing, Grand Rapids, and Saginaw.

Table 4-2 identifies the annual and average rate of increase to Flint based on supplying water either to the current FL-1 at Potter and Baxter or Imlay. Note the last three years of the rates (FY 2011 through FY 2013) assumes that Flint's cost would be based on the new 30 year contract; FY 2011 being the first year that the new contract was available.



| Fiscal Year | Average Unit Cost (\$/MCF) | Annual Change (%) |
|-------------|----------------------------|-------------------|
| 2004        | 11.06                      |                   |
| 2005        | 10.24                      | -7.4              |
| 2006        | 10.56                      | 3.1               |
| 2007        | 11.09                      | 5.0               |
| 2008        | 11.35                      | 2.3               |
| 2009        | 13.07                      | 15.2              |
| 2010        | 11.73                      | -10.3             |
| 2011        | 13.89                      | 18.4              |
| 2012        | 15.08                      | 8.6               |
| 2013        | 16.24                      | 7.7               |
| Average     |                            | 4.4%              |

## From FL-1

| Fiscal Year | Average Unit Cost (\$/MCF) | Annual Change (%) |
|-------------|----------------------------|-------------------|
| 2004        | 11.06                      |                   |
| 2005        | 10.24                      | -7.4              |
| 2006        | 10.56                      | 3.1               |
| 2007        | 11.09                      | 5.0               |
| 2008        | 11.35                      | 2.3               |
| 2009        | 13.07                      | 15.2              |
| 2010        | 11.16                      | -14.6             |
| 2011        | 12.23                      | 9.6               |
| 2012        | 13.28                      | 8.6               |
| 2013        | 14.32                      | 7.8               |
| Average     |                            | 2.9%              |

## From Imlay

Table 4-2: Recent DWSD Water Rates

Audited financial reports were used to determine the rate of inflation associated with other three large municipal systems. The results are shown in Table 4-3.

| Water Systems | Years Evaluated | Average Rate (%) |
|---------------|-----------------|------------------|
| Lansing       | 05'-12'         | 4.6              |
| Grand Rapids  | 04'-11'         | 1.6              |
| Saginaw       | 04'-11'         | 7.0              |

**Table 4-3: O&M Inflation Rates of Other Large Water Systems**

Based on the information analyzed from DWSD and the other communities, it was determined that a fair annual rate of inflation for operations and maintenance cost for the analysis should be 4.4%. The 4.4% has historical significance from Flint's current water supplier and falls within the range of the other communities.

### ***KWA Water Supply***

The initial projected O&M cost for the KWA supply would be comprised of KWA's O&M costs as well as Flint's O&M costs. Because there was limited information provided, the initial estimated rate of \$1.50/MCF was used. This rate is based on information from the cost comparison analysis attached to the letter to Mr. Kurtz, dated October 31, 2012.

The KWA cost evaluation used an annual O&M inflation rate of 5%. To validate this rate a similar analysis to DWSD's operations and maintenance annual rate of inflation was used. First, in discussions with Flint and the Genesee County Drain Commission (GCDC), they believed that the annual rate of inflation for the new KWA system would be similar to the GCDC Water & Waste Services (WWS). Additionally, two large transmission systems were used to benchmark the inflation rates: the Southeastern Oakland County Water Authority (SOCWA) and the Ypsilanti Utility Community Authority (YUCA). Although both of these systems transmit finished water opposed to raw water, they were considered similar enough for comparison as they are comprised of only large water mains, pumping facilities and storage.

Once again audited financial statements were used to calculate the inflation rates. A summary of the findings are shown in Table 4-4. Based on the fact that the information analyzed showed a large difference between the two systems, it was determined that the KWA assumption of 5% was a good rate of inflation to use in the financial analysis. This rate is almost equally between the GCDC rate and the other two transmission systems.

| Systems  | Years Evaluated | Average Rate (%) |
|----------|-----------------|------------------|
| GCDC WWS | 03' – 11'       | 10.5             |
| SOCWA    | 04'-12'         | --               |
| YUCA     | 04'-12'         | 0.7              |

**Table 4-4: O&M Inflation Rates of Other Comparable Systems to KWA**

### ***Flint WTP***

The Flint WTP currently serves as a backup supply to the DWSD service to Flint. To maintain backup operations, the City of Flint operates the plant approximately 20 days each year. Flint indicated that the average production rate when they operate is 11 MGD.

For the blending options and the KWA supply considered, Flint would be required to operate its plant all year around. Therefore, their operating and maintenance costs were evaluated and adjusted to determine an annual cost associated with year-round operations.

The Flint WTP provided three years of operating costs for the assessment. Additionally, reports listed in Section 3 were also used as reference to determine both operating costs for the plant processing Flint River water (blending options) and Lake Huron raw water (KWA option).

Major cost centers were analyzed to estimate annual operation and maintenance. They included: labor, utilities, chemicals and residual management. In general, as recommended by the Flint plant staff, labor and overhead were increased from the current costs by two-thirds. Additionally, variable costs for power, chemicals and residual cost were increased to estimate full time treatment at the Flint WTP. Data from the KWA Preliminary Report and annual operating data for the Flint WTP (provided separately) were analyzed to make these forecasts.

The annual operating and maintenance costs developed for Flint WTP used are shown in Table 4-5.

| Source of Supply                 | Average Daily Production (MGD) | Estimated Annual O&M Cost |
|----------------------------------|--------------------------------|---------------------------|
| Flint River (Blending with DWSD) | 4                              | \$5,895,097               |
| Lake Huron (Supplied by KWA)     | 12                             | \$7,913,118               |

**Table 4-5: FY 13 O&M Costs for Year-round Operations**

It was determined that a fair annual rate of inflation for operations and maintenance cost for the Flint WTP plant should be 4.51%. The 4.51% is an average of Lansing, Grand Rapids and Saginaw facilities.

## 5. CAPITAL REQUIREMENTS

Large capital investments would be required by Flint and GCDC to construct the KWA supply system. Furthermore, some of the options presented by DWSD (supply point from Imlay) would require the purchase by Flint of DWSD's 72-inch water main. Performing the financial analysis; therefore, required an analysis of the KWA construction cost estimate for the transmission system and Flint WTP improvements.

Revenue bonds were also identified as the source of financing the new supply system and associated improvements. This section describes the assumptions made and the interest used for financing the improvements.

### *KWA Supply System*

The most current cost estimate of the KWA system was presented in the document titled; Lake Huron Supply Study, KWA, Appendix 20, October 2012 Preliminary Report Update, Final Report (DRAFT), October 4, 2012. The cost of construction is estimated at \$272,421,558. Flint's portion would be 30% or \$81,726,467.

Due to the significance of this expenditure, a detailed review of the cost was performed and is presented in this section. The analysis was performed based on the main elements of the supply system: the lake intake, the two pumping stations, and the transmission pipeline. Additionally, an analysis was performed related to construction contingencies and other costs such as engineering, legal, and administration.

### **Lake Intake**

KWA representatives indicated in a meeting in November that the design documents for the intake were at 90% and that it was planned for advertisement in January 2013. A summary of the estimate is shown in Table 5-1.

| Description     | Estimate            |
|-----------------|---------------------|
| Intake and Crib | \$22,076,850        |
| ELAC at 25%     | 5,519,213           |
| Property        | 2,300,000           |
| <b>Total</b>    | <b>\$29,896,063</b> |

**Table 5-1: KWA Intake Cost Estimate**

Based on the evaluation, it appeared that the cost estimate was reasonable. Given that the design was nearly complete, the engineering, legal, administration, and construction contingencies (ELAC) at 25% were also found to be appropriate.

## Pumping Stations

KWA representatives indicated that the pump stations were estimated at a level of design less than 15%. Therefore, in addition to an evaluation of their cost estimate, other water pumping station costs were used for comparison. Additionally, contractors were also contacted for costs. Table 5-2 summarizes the KWA cost estimate compared to our cost estimate performed for the Treasury.

| Description                                      | KWA | Estimate            | TWR | Estimate            |
|--------------------------------------------------|-----|---------------------|-----|---------------------|
| Pumping Stations                                 |     | \$24,618,080        |     | \$54,573,314        |
| Land for Intermediate Pump Station and Reservoir |     | --                  |     | 75,000              |
| Subtotal                                         |     | \$24,618,080        |     | \$54,648,314        |
| ELAC for Construction                            | 25% | 6,154,520           | 30% | 16,394,494          |
| <b>Total</b>                                     |     | <b>\$30,772,600</b> |     | <b>\$71,042,808</b> |

**Table 5-2: Pumping Stations Cost Estimate**

Two things to note regarding the difference in the cost estimates; firstly, there is a large difference in the cost estimates of the pumping stations. The estimate developed for the Treasury used several other pumping stations construction costs from Southeastern Michigan and discussions with contractors. These costs were then computed on a \$/MG's for comparison.

Secondly, our estimate for the Treasury is based on an ELAC of 30% instead of KWA's 25%. Although 25% was acceptable for the intake, it is believed to be too low for the pumping station estimate given that the engineering effort is less than 15%.

## Transmission Main

Although the specific route for the transmission main was not provided, an estimate was calculated based on the general information provided. Once again, the KWA estimate was based on a level of design less than 15%. The estimate performed for the Treasury used the line items provided by KWA for the pipeline and also consulted with contractors to evaluate the cost of construction. The comparison is shown in Table 5-3.

Although the cost of construction of the pipeline is similar, a value of 30% was used for ELAC due to the level of design. Additionally, KWA did not believe there would be any additional costs for easements; however, this did not seem practical. Therefore an estimate for acquiring the easements was added to the Treasury estimate and is based on the 277 easements identified by KWA. The cost shown includes surveying, legal, engineering, administration, etc.

| Description           | KWA | Estimate             | TYJT | Estimate             |
|-----------------------|-----|----------------------|------|----------------------|
| Transmission Mains    |     | \$166,202,316        |      | \$167,419,530        |
| ELAC for Construction | 25% | 41,550,579           | 30%  | 50,225,859           |
| Subtotal              |     | \$207,752,895        |      | \$217,645,389        |
| Easements             |     | --                   |      | 1,166,170            |
| <b>Total</b>          |     | <b>\$207,752,895</b> |      | <b>\$218,811,559</b> |

Table 5-3: Transmission Pipeline Cost Estimate

### Other KWA Costs

In prior estimates of the construction cost, KWA used an ELAC of 37%. In this case it could be considered that the engineering effort associated with the design would have been included. However, it is believed that KWA's reduced ELAC of 25%, does not include the design effort. Additionally, it would be prudent to assume that the owner would want a construction manager during construction of this large project. A summary of these costs are shown in Table 5-4.

| Description                                                             | Estimate            |
|-------------------------------------------------------------------------|---------------------|
| Design Engineering for Pumping Stations and the Transmission Pipeline   | \$16,939,581        |
| Construction Management at 5% of Project Cost Estimate of \$217,645,389 | 14,434,609          |
| Administration                                                          | 349,440             |
| Legal, Easements, Contract Documents                                    | 831,000             |
| <b>Total</b>                                                            | <b>\$32,554,630</b> |

Table 5-4: Other Costs

### Summary Comparison

A summary of the two cost estimates are shown in Table 5-5. Based on the comparison, the estimate performed by TYJT shows a higher cost to Flint by approximately \$25,000,000.

Note that there are two other costs shown in the summary that were not previously addressed; power and backup power. Regarding the cost of providing power to the pumping facilities, the cost of \$4,000,000 appears reasonable.

The KWA has repeatedly indicated that backup power is not needed. Backup power is a standard practice in the water industry. Furthermore, a loss of power at either pumping facility will prevent the supply of water to both Flint and Genesee County. For these reasons, the cost of providing backup power was included in our estimate for the Treasury.

| Description                            | KWA Estimate          | TYJT Estimate         |
|----------------------------------------|-----------------------|-----------------------|
| Intake/Crib                            | \$ 27,596,063         | \$ 27,596,063         |
| Pump Stations                          | 30,772,600            | 71,042,808            |
| Transmission Mains                     | 207,752,895           | 217,645,389           |
| Power                                  | 4,000,000             | 4,000,000             |
| Redundant Power for PS                 |                       | 1,273,200             |
| Land for Lake Huron Pumping Station    | 2,300,000             | 2,300,000             |
| Design Engineering/PS and Transmission |                       | 16,939,581            |
| Construction Management                |                       | 14,434,410            |
| Administration                         |                       | 349,440               |
| Legal/Easement/Contract Documents      |                       | 831,000               |
| Easements                              |                       | 1,166,170             |
| <b>Total</b>                           | <b>\$ 272,421,558</b> | <b>\$ 357,578,060</b> |
| <b>Flint Share at 30%</b>              | <b>\$81,726,467</b>   | <b>\$107,273,418</b>  |

Table 5-5: Total Cost Comparison

### ***Flint WTP Improvements***

The KWA analysis identified capital costs required to convert the existing WTP from river water treatment to treating lake water. The cost estimate was identified as \$7,100,000 in the 2009 report. This number was used in our analysis, since additional information was not provided. For the purpose of the financial analysis; however, the \$7,100,000 was increased by 3% each year for three years to account for inflation.

### ***DWSD Imlay Station Supply Options***

The options identified by DWSD to supply service to Flint at the Imlay Pump Station would require Flint to purchase the 72-inch water main from Imlay to Master Meter, FL-1. The pipeline is approximately 25 miles long. The estimated cost provided by DWSD for estimating purposes is \$4,700,000.

### ***Financing***

The cost of financing the revenue bonds for the capital work was investigated. Based on conversations with local financial advisors knowledgeable in bond financing, an interest rate of 5% for the 25 year

period was considered acceptable. This is based on a Standard and Poor's bond rating of A without insurance.

Additional costs associated with the bond include the reserve and bond issuance fee. The bond holders will require a reserve of approximately 10% of the loan to be held for the 25 year payment period. The cost associated with the bond issuance has been estimated at 2.25% of the principal borrowed for the KWA project and 3% for the smaller loan associated with the Flint WTP improvements or the purchase of the 72-inch main.

Furthermore, since no revenue will be generated to pay on the bonds for the first three years that the system is being constructed, the cost associated with capitalizing the interest was also included.

Finally, interest on the reserve will be provided back to KWA and Flint. Although the interest is currently less than 1%, it was determined that a 3% rate would be more prudent long-term.



## 6. FINDINGS

Using the information described in the previous sections, a cost evaluation was conducted for the KWA supply and the DWSD options. Individual worksheets for each option are provided in Appendix B. For the purpose of comparison a 30 year period was used. This period includes the 3 year construction period, the 25 loan period and an additional two years to get a sense of the cost of operation after the loans have been paid.

There were three separate cost sheets prepared for the KWA option. The first cost sheet (KWA) is based on the cost estimate provided by KWA. The costs provided assumed no overruns or delay in construction. With KWA's own assumptions of an overrun in construction of 15% and a one year delay in operations, the KWA estimated cost becomes \$686,375,920 through Year 2042.

Since this cost estimate did not appear to include the financing of revenue bonds, another cost sheet (KWA-1) was developed that included KWA's cost estimate without overruns with the additional finance costs associated with the revenue bonds. A final cost sheet (KWA-2) includes the cost associated with the revenue bonds based on the estimate provided by TYJT for the Treasury.

A summary of the cost sheets provided in Appendix B are shown in Table 6-1. Figure 6-1 shows the cumulative annual costs associated with each option.

| Option                                              | Costs through 2042 (\$) | Ranking by Cost |
|-----------------------------------------------------|-------------------------|-----------------|
| DWSD 8 MGD Maximum Day at Imlay Station             | 634,795,488             | 1               |
| KWA (10/31/12 No Overruns, As Provided)*            | 649,775,166             | 2               |
| DWSD 8 MGD Maximum Day at FL-1                      | 672,671,705             | 3               |
| KWA-1 (10/31/12 No Overruns with Cost of Financing) | 707,279,715             | 4               |
| DWSD 12 MGD Maximum Day at Imlay Station            | 725,576,803             | 5               |
| DWSD 12 MGD Maximum Day at FL-1                     | 762,110,308             | 6               |
| KWA-2 (Treasury Estimate)                           | 766,784,313             | 7               |
| DWSD 18 MGD Maximum Day at FL-1                     | 821,226,268             | 8               |

\* \$686,375,920 with 15% overrun in construction and a one year delay in operations

**Table 6-1: Total Cost of Options through 2042**

Based on the analysis, it is prudent to assume the KWA water supply option costs would be somewhere between the KWA-1 and KWA-2 options. Therefore, the analysis indicates that the two DWSD options of supplying 8 MGD on a maximum day and up to 8 MGD on average are the least cost options for Flint. These options allow Flint to maximize the use of existing assets; the City of Flint's (the Flint WTP) and DWSD's (the existing 72-inch main).

Additionally, in recent conversations with the Treasury another option was discussed that could potentially be the most cost-effective solution. Currently the Flint WTP serves as a backup if service is

lost through either the DWSD or KWA pipeline. If the a twin pipe paralleling the DWSD 72-inch water main were constructed with interconnects with the 72-inch line, then the new water main could serve as the backup to Flint and the Flint WTP could be abandoned or potentially sold to Genesee County for their use.

The construction of the parallel pipeline would be considered in the DWSD capital expenditure as a Common to All (CTA) cost. This means that the capital cost of the pipeline would be shared by all DWSD customers and not just by Flint. Preliminary analysis of this option appears to be the most cost-effective of all the options discussed. However, a more thorough cost analysis is warranted and this approach would require an agreement between Flint and DWSD.

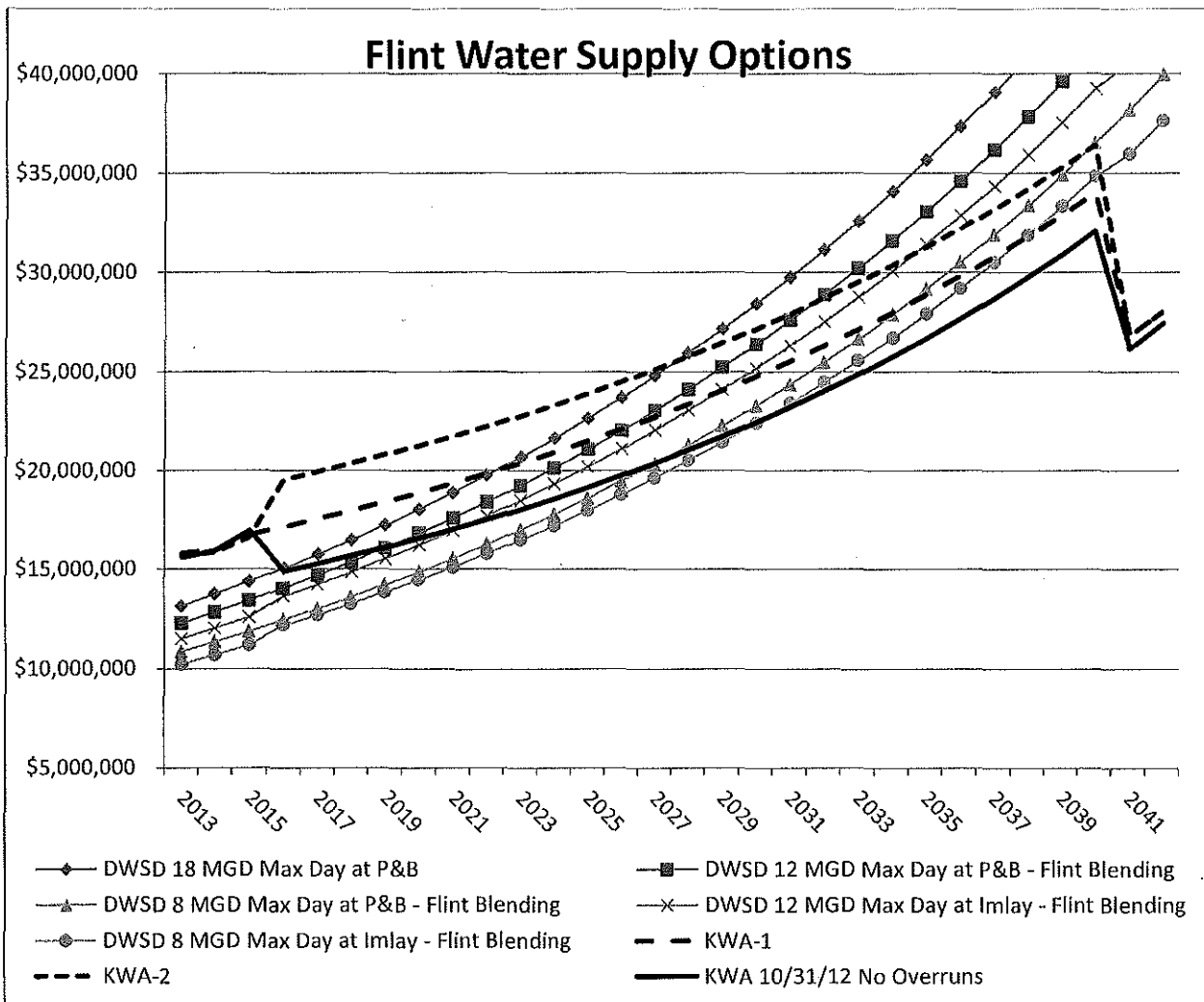


Figure 6-1: Flint Water Supply Options through 2042

## **7. OTHER CONSIDERATIONS**

As part of the investigation other issues were identified that may result in risks to Flint that should be considered by the Treasury in determining how Flint's potable water should be supplied. These issues are related to redundancy and reliability, other items affecting cost, and Flint's desire to control its own destiny related to its water supply. These are described further below.

### ***Redundancy/Reliability***

In one of the first meetings related to this task assessment, which was held on November 1, 2012, the Genesee County Drain Commissioner, Mr. Jeff Wright, stated that one of the main reasons for pursuing the KWA supply option related to the lack of reliability of the DWSD system. He pointed to the Northeast blackout of 2003; a widespread power outage that occurred throughout parts of the Northeastern and Midwestern United States and Ontario, Canada, on Thursday, August 14, 2003. He stated that Flint and Genesee County were out of water for several days.

It is worth noting that this was a power outage of historic proportions that affected millions of Americans. However, DWSD did begin supplying water again relatively quickly in comparison to other major cities impacted by the same power outage.

Furthermore, the KWA supply system offers less redundancy to Flint than the current DWSD system. Under both options, Flint is supplied by a single pipeline; however, DWSD has backup power at all of its major facilities supplying Flint. The KWA system will not have a redundant power at its pumping facilities. This would be a major risk.

Currently, backup to the DWSD system for Flint is Flint's WTP using the Flint River as the source of supply. KWA has stated that the Flint River source would also be used as backup to Flint if the KWA supply through its pipeline was lost. However, since the Flint WTP would be upgraded to treat Lake Huron water under the KWA option, using the Flint River as a backup source would require the Flint WTP to maintain two process treatment streams.

In addition to Flint and Genesee County, the DWSD's 72-inch main supplies Imlay City, Mayfield and the Greater Lapeer County Utilities Authority (GLCUA). The volume of water contained within the 72-inch main is approximately 30 MG. Only supplying these three remaining communities would cause the water age to increase dramatically; somewhere in excess of three weeks old, before reaching the customers' master meters. Since the half-life of chlorine in the DWSD system is approximately 5 days, the chlorine would most probably be near zero requiring re-chlorination of the finished water upstream of the master meters.

Re-chlorinating is a costly and risky process due to the instability of chlorine gas. It is unknown whether DWSD would pursue this improvement or possibly abandoned the 72-inch pipeline.

If Flint is supplied by the KWA system, then DWSD supplying their other customers along the 72-inch water main may be reconsidered. Since the KWA system is a raw water supply, the communities would

either have to build a treatment facility to treat the water from KWA or find another water source for their communities.

### ***Additional Cost and Risk Considerations***

The design of the KWA supply and the construction of the system have not been completed; therefore, final costs and time to complete are unknown. Cost overruns and delays in completion will both negatively impact Flint's final cost. As example, if the project is not completed within the three year period, payment on the bonds will be due, but the revenue source needed from the sale of water could not be provided.

Furthermore, there is always a risk with large water system construction; especially those including an intake in the Great Lakes, pumping stations and rehabilitation of older water treatment plants. These risks include the potential of explosive gases in tunneling below Lake Huron, changing site conditions associated with the large number of miles of pipe installation and rehabilitating an older WTP, and the startup and debugging of the entire pumping system.

Flint has indicated that they have a high water loss. Not addressing this issue prior to sizing the Flint supply pipeline from KWA could cause the water main to be oversized along with its incremental cost in construction.

Also, the KWA supply option appears to run counter to the Treasury's Competitive Grant Assistance Program (Formerly EVIP Grant). This program has been put in place to allow for communities to consolidate their services and save money. Two existing customers of DWSD (Flint and Genesee County) along with the potential of others customers (GLCUA, Mayfield, Imlay City) separating to from another water system is in contradiction to the program.

Finally, there is a concern over the ability of smaller systems (KWA) over larger systems (DWSD) to pay for future unfunded mandates and regulations. Obviously, identifying regulation requirements over 30 years is hard to determine. However, it is widely accepted that a large system has greater ability to respond to unfunded mandates because the cost can be distributed over a large customer base.

### ***Flint's Autonomy***

Flint has indicated that a major point of consideration is that they have no control over the rate increases issued to Flint by DWSD. All other counties supplied by DWSD have representatives on the Board of Water Commissioners (BOWC). The BOWC is one of the governing bodies that approve the water rates. Since Flint and Genesee County do not have a representative on the BOWC, Flint believes they are held "hostage" to DWSD's rates and cost of service.

This issue was stated in Flint's handout at the November 1, 2012 meeting. The handout is titled, "Flint Water Supply Future." However, it is worth noting in the same handout, Flint also identifies similar concerns with the governing board of the KWA system. Notably, that although Flint and Genesee County will be the only customers and Flint will be responsible for 30 percent of the construction cost,

they will have a minority vote on the KWA board. Furthermore, there are other communities (Lapeer County, the City of Lapeer, and Sanilac County) that sit on the board and vote. However, they are not purchasing water nor contributing to the construction costs.

STATE OF MICHIGAN CONTRACT NO. 271N3200089

CITY OF FLINT WATER SUPPLY ASSESSMENT

State of Michigan, Department of Treasury

**Appendix A: Meeting Minutes**

## MEETING MINUTES

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**IN ATTENDANCE:** Sue McCormick, DWSD Director  
Darryl Latimer, DWSD Deputy Director  
George Karmo, TYJT  
Awni Qaqish, TYJT  
Dave Guastella, TYJT

**DATE:** November 24, 2012

**PURPOSE OF MEETING:** Meeting with DWSD for the Indefinite-scope, Indefinite-delivery Contract Number 00383, 2012 Professional General Architectural/Engineering Services – City of Flint Water Supply Assessment

**PREPARED BY:** Dave Guastella

A meeting was held at the DWSD Main Office Building on November 19, 2012 to discuss the water supply options being presented by DWSD to the City of Flint. The main items discussed generally followed the attached DWSD Discussion/Questions that were provided to the Department prior to the meeting. A summary of the key points discussed are provided below.

### DISCUSSION ITEMS

1. Question/Discussion Item: Verify that the four options presented at the November 1, 2012 meeting are still available for consideration:
  - a. Supplied from Potter & Baxter using the new model contract (assume a Maximum Day Customer),
  - b. Supplied from Imlay Station,
  - c. Finished un-pumped supply from Lake Huron WTP, and
  - d. Raw un-pumped supply from Lake Huron WTP.

*DWSD prefers to focus on the first two supply point listed; from the current location at Potter & Baxter and at the Imlay Pump Station as these apply specifically to Flint.*

*DWSD provided the attached summary regarding the current costs to Flint based on the various options that DWSD is offering. The savings associated with each option is provided as well. As example, if Flint were to purchase water from the supply point located at Imlay Station, the current cost to Flint would be \$5,661,000 and it would be a savings of nearly 50%*

Comments: Meeting minutes were recorded based on the understanding of the author. Please contact the author within three days if you have any different understanding of the meeting. These minutes will be considered approved unless comments are provided within three days.

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*compared to Flint's current rate.*

2. Question/Discussion Item: What additional capital improvements will be required for each option?

*If Imlay Pump Station is selected as the supply point then Flint would need to purchase the 72-inch water main and an agreement to supply Lapeer would need to be worked out. DWSD believes that this could be worked out through a "wheeling" charge over the 72-inch main or possibly moving the supply point downstream of the Lapeer connection.. DWSD estimates the value of the water main at \$4.7M. Flint could bond for this amount or DWSD could include the cost into Flint's rate.*

3. Question/Discussion Item: Are there other options being presented that should be considered (e.g., blending)?

*Only the two options indicated above are currently being considered and both would include blending; DWSD providing 2/3 of the supply and the Flint WTP providing the other 1/3.*

4. Question/Discussion Item: To evaluate each option over the 25 year planning period, provide:
- a. Annual water rate for Flint for 2002 through 2012, and the
  - b. Projected annual rate adjustment for each option. What are the proposed measures to keep the rate adjustments down in the future?

*DWSD provided the attached historical rates from 2002 through 2012 for the existing water contract with Flint. The attachment also includes what the rates would have been if Flint had signed the new model contract or had taken service from Imlay. These rates were provided back to 2010.*

*DWSD believes that 5% would be a good estimation to assume for their annual escalation in rates over the 25 year planning period.*

5. Question/Discussion Item: Flint stated a 10% increase in the capacity charge. What number did DWSD provide Flint?

*It was unclear to DWSD where the 10% increase in capacity charge stated by Flint came from. DWSD's information provided shows an average of 6.3%. DWSD offered a meeting with TYJT to discuss how the fixed and commodity charges are allocated.*

6. Question/Discussion Item: Flint financial comparison is based on the initial Cost of \$14,413,858, which includes \$2,725,538 for Flint WTP operating cost; i.e, DWSD charge is \$11,688,320. How good is this number?

*DWSD indicated that the charge of \$11,638,320 is good through 6/30/13.based on their existing contract with DWSD.*

7. Question/Discussion Item: KWA's initial charge to Flint is based on 12 MGD. Is DWSD charge

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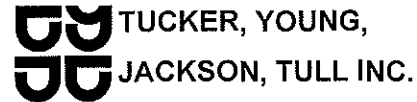


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based on 12 MGD?

*Yes, 12 MGD from DWSD would be a maximum with Flint supplying 6 MGD for a total of 18 MGD (2/3 vs. 1/3).*

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**Indefinite-scope, Indefinite-delivery Contract Number 00383  
2012 Professional General Architectural/Engineering Services**

**CITY OF FLINT WATER SUPPLY ASSESSMENT**

DWSD Discussion/Questions for the November 19, 2012 Meeting

1. Verify that the four options presented at the November 1, 2012 meeting are still available for consideration:
  - c. Supplied from Potter & Baxter using the new model contract (assume a Maximum Day Customer),
  - d. Supplied from Imlay Station,
  - e. Finished un-pumped supply from Lake Huron WTP, and
  - f. Raw un-pumped supply from Lake Huron WTP.
2. What additional capital improvements will be required for each option?
3. Are there other options being presented that should be considered (e.g., blending)?
4. To evaluate each option over the 25 year planning period, provide:
  - g. Annual water rate for Flint for 2002 through 2012, and the
  - h. Projected annual rate adjustment for each option. What are the proposed measures to keep the rate adjustments down in the future?
5. Flint stated a 10% increase in the capacity charge. What number did DWSD provide Flint?
6. Flint financial comparison is based on the initial Cost of \$14,413,858, which includes \$2,725,538 for Flint WTP operating cost, i.e DWSD charge is \$11,688,320. How good is this number?
7. KWA's initial charge to Flint is based on 12 MGD. Is DWSD charge based on 12 MGD?

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Summary of DWSD Cost Allocations to Flint Under Various Scenarios  
*Flint Only*

|                                  | Revenue            | Rates and Charges |                  |                      |
|----------------------------------|--------------------|-------------------|------------------|----------------------|
|                                  | <u>Requirement</u> | <u>Fixed</u>      | <u>Commodity</u> | <u>Avg Unit Cost</u> |
| 1 <b>Status Quo</b>              | 11,461,700         | 357,271           | 12.46            | 19.91                |
| 2 <b>Model Contract</b>          | 9,732,100          | 275,517           | 11.16            | 16.90                |
| 3 <b>Change</b>                  | (1,729,600)        | (81,754)          | (1.30)           | (3.00)               |
| 4 <b>% Change</b>                | -15.1%             | -22.9%            | -10.4%           | -15.1%               |
| 5 <b>Max Day Only</b>            | 9,424,700          | 271,010           | 10.72            | 16.37                |
| 6 <b>Change</b>                  | (307,400)          | (4,507)           | (0.44)           | (0.53)               |
| 7 <b>% Change</b>                | -3.3%              | -1.7%             | -4.1%            | -3.3%                |
| 8 <b>Allow Blending</b>          | 6,302,800          | 182,369           | 10.72            | 16.42                |
| 9 <b>Change</b>                  | (3,121,900)        | (88,641)          | 0.00             | 0.05                 |
| 10 <b>% Change</b>               | -49.5%             | -48.6%            | 0.0%             | 0.3%                 |
| 11 <b>Imlay City Connections</b> | 5,800,700          | 170,912           | 9.77             | 15.11                |
| 12 <b>Change</b>                 | (502,100)          | (11,457)          | (0.95)           | (1.31)               |
| 13 <b>% Change</b>               | -8.7%              | -6.7%             | -9.7%            | -8.7%                |
| 14 <b>Cumulative Change</b>      | (5,661,000)        | (186,359)         | (2.69)           | (4.80)               |
| 15 <b>Cumulative %Change</b>     | -49.4%             | -52.2%            | -21.6%           | -24.1%               |

|                                 | Assumptions |            |            |              |             |            |
|---------------------------------|-------------|------------|------------|--------------|-------------|------------|
|                                 | Avg Day     | Max Day    | Peak Hour  | Distance     | Elevation   | Sales      |
|                                 | <i>mgd</i>  | <i>mgd</i> | <i>mgd</i> | <i>miles</i> | <i>feet</i> | <i>mgd</i> |
| 1 <b>Status Quo</b>             | 11.8        | 21.6       | 22.6       | 52.0         | 866         | 11.8       |
| 2 <b>Model Contract</b>         | 11.8        | 17.9       | 18.8       | 52.0         | 866         | 11.8       |
| 3 <b>Max Day Only</b>           | 11.8        | 17.9       | 17.9       | 52.0         | 866         | 11.8       |
| 4 <b>Allow Blending</b>         | 7.9         | 11.9       | 11.9       | 52.0         | 866         | 7.9        |
| 5 <b>Imlay City Connections</b> | 7.9         | 11.9       | 11.9       | 45.2         | 866         | 7.9        |

## Recent DWSD Water Rates to Flint

| FY                                 | Rates and Charges |                     |                         | Annual Change  |                     |                         | Average       |
|------------------------------------|-------------------|---------------------|-------------------------|----------------|---------------------|-------------------------|---------------|
|                                    | Fixed<br>\$/mo    | Commodity<br>\$/Mcf | Avg Unit Cost<br>\$/Mcf | Fixed<br>\$/mo | Commodity<br>\$/Mcf | Avg Unit Cost<br>\$/Mcf | Annual Change |
| <i>As Charged</i>                  |                   |                     |                         |                |                     |                         |               |
| 2004                               |                   | 11.06               | 11.06                   |                |                     |                         |               |
| 2005                               |                   | 10.24               | 10.24                   |                |                     | -7.4%                   |               |
| 2006                               |                   | 10.56               | 10.56                   |                |                     | 3.1%                    |               |
| 2007                               |                   | 11.09               | 11.09                   |                |                     | 5.0%                    |               |
| 2008                               |                   | 11.35               | 11.35                   |                |                     | 2.3%                    |               |
| 2009                               |                   | 13.07               | 13.07                   |                |                     | 15.2%                   |               |
| 2010                               |                   | 14.32               | 14.32                   |                |                     | 9.6%                    |               |
| 2011                               | 182,301           | 14.29               | 16.01                   |                | -0.2%               | 11.8%                   |               |
| 2012                               | 443,096           | 13.36               | 17.53                   | 143.1%         | -6.5%               | 9.5%                    |               |
| 2013                               | 707,000           | 12.46               | 19.12                   | 59.6%          | -6.7%               | 9.1%                    | 6.3%          |
| <i>Hypothetical Model Contract</i> |                   |                     |                         |                |                     |                         |               |
| 2004                               |                   | 11.06               | 11.06                   |                |                     |                         |               |
| 2005                               |                   | 10.24               | 10.24                   |                |                     | -7.4%                   |               |
| 2006                               |                   | 10.56               | 10.56                   |                |                     | 3.1%                    |               |
| 2007                               |                   | 11.09               | 11.09                   |                |                     | 5.0%                    |               |
| 2008                               |                   | 11.35               | 11.35                   |                |                     | 2.3%                    |               |
| 2009                               |                   | 13.07               | 13.07                   |                |                     | 15.2%                   |               |
| 2010                               |                   | 13.96               | 13.96                   |                |                     | 6.8%                    |               |
| 2011                               | 145,918           | 13.74               | 15.28                   |                | -1.6%               | 9.5%                    |               |
| 2012                               | 378,968           | 12.58               | 16.57                   | 159.7%         | -8.4%               | 8.4%                    |               |
| 2013                               | 597,323           | 11.63               | 17.93                   | 57.6%          | -7.6%               | 8.2%                    | 5.5%          |

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## Recent DWSD Water Rates to Flint

| FY                                              | Rates and Charges |                     |                         | Annual Change  |                     |                         | Average       |
|-------------------------------------------------|-------------------|---------------------|-------------------------|----------------|---------------------|-------------------------|---------------|
|                                                 | Fixed<br>\$/mo    | Commodity<br>\$/Mcf | Avg Unit Cost<br>\$/Mcf | Fixed<br>\$/mo | Commodity<br>\$/Mcf | Avg Unit Cost<br>\$/Mcf | Annual Change |
| <i>As Charged</i>                               |                   |                     |                         |                |                     |                         |               |
| 2004                                            |                   | 11.06               | 11.06                   |                |                     |                         |               |
| 2005                                            |                   | 10.24               | 10.24                   |                |                     | -7.4%                   |               |
| 2006                                            |                   | 10.56               | 10.56                   |                |                     | 3.1%                    |               |
| 2007                                            |                   | 11.09               | 11.09                   |                |                     | 5.0%                    |               |
| 2008                                            |                   | 11.35               | 11.35                   |                |                     | 2.3%                    |               |
| 2009                                            |                   | 13.07               | 13.07                   |                |                     | 15.2%                   |               |
| 2010                                            |                   | 14.32               | 14.32                   |                |                     | 9.6%                    |               |
| 2011                                            | 182,301           | 14.29               | 16.01                   |                | -0.2%               | 11.8%                   |               |
| 2012                                            | 443,096           | 13.36               | 17.53                   | 143.1%         | -6.5%               | 9.5%                    |               |
| 2013                                            | 707,000           | 12.46               | 19.12                   | 59.6%          | -6.7%               | 9.1%                    | 6.3%          |
| <i>Hypothetical Model Contract - Flint Only</i> |                   |                     |                         |                |                     |                         |               |
| 2004                                            |                   | 11.06               | 11.06                   |                |                     |                         |               |
| 2005                                            |                   | 10.24               | 10.24                   |                |                     | -7.4%                   |               |
| 2006                                            |                   | 10.56               | 10.56                   |                |                     | 3.1%                    |               |
| 2007                                            |                   | 11.09               | 11.09                   |                |                     | 5.0%                    |               |
| 2008                                            |                   | 11.35               | 11.35                   |                |                     | 2.3%                    |               |
| 2009                                            |                   | 13.07               | 13.07                   |                |                     | 15.2%                   |               |
| 2010                                            |                   | 11.73               | 11.73                   |                |                     | -10.3%                  |               |
| 2011                                            | 70,060            | 12.45               | 13.89                   |                | 6.1%                | 18.4%                   |               |
| 2012                                            | 175,882           | 11.47               | 15.08                   | 151.0%         | -7.9%               | 8.6%                    |               |
| 2013                                            | 272,923           | 10.65               | 16.24                   | 55.2%          | -7.1%               | 7.7%                    | 4.4%          |

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## Recent DWSD Water Rates to Flint

| FY                                                      | Rates and Charges |                     |                         | Annual Change  |                     |                         | Average       |
|---------------------------------------------------------|-------------------|---------------------|-------------------------|----------------|---------------------|-------------------------|---------------|
|                                                         | Fixed<br>\$/mo    | Commodity<br>\$/Mcf | Avg Unit Cost<br>\$/Mcf | Fixed<br>\$/mo | Commodity<br>\$/Mcf | Avg Unit Cost<br>\$/Mcf | Annual Change |
| <i>As Charged</i>                                       |                   |                     |                         |                |                     |                         |               |
| 2004                                                    |                   | 11.06               | 11.06                   |                |                     |                         |               |
| 2005                                                    |                   | 10.24               | 10.24                   |                |                     | -7.4%                   |               |
| 2006                                                    |                   | 10.56               | 10.56                   |                |                     | 3.1%                    |               |
| 2007                                                    |                   | 11.09               | 11.09                   |                |                     | 5.0%                    |               |
| 2008                                                    |                   | 11.35               | 11.35                   |                |                     | 2.3%                    |               |
| 2009                                                    |                   | 13.07               | 13.07                   |                |                     | 15.2%                   |               |
| 2010                                                    |                   | 14.32               | 14.32                   |                |                     | 9.6%                    |               |
| 2011                                                    | 182,301           | 14.29               | 16.01                   |                | -0.2%               | 11.8%                   |               |
| 2012                                                    | 443,096           | 13.36               | 17.53                   | 143.1%         | -6.5%               | 9.5%                    |               |
| 2013                                                    | 707,000           | 12.46               | 19.12                   | 59.6%          | -6.7%               | 9.1%                    | 6.3%          |
| <i>Hypothetical Model Contract - Flint Only @ Imlay</i> |                   |                     |                         |                |                     |                         |               |
| 2004                                                    |                   | 11.06               | 11.06                   |                |                     |                         |               |
| 2005                                                    |                   | 10.24               | 10.24                   |                |                     | -7.4%                   |               |
| 2006                                                    |                   | 10.56               | 10.56                   |                |                     | 3.1%                    |               |
| 2007                                                    |                   | 11.09               | 11.09                   |                |                     | 5.0%                    |               |
| 2008                                                    |                   | 11.35               | 11.35                   |                |                     | 2.3%                    |               |
| 2009                                                    |                   | 13.07               | 13.07                   |                |                     | 15.2%                   |               |
| 2010                                                    |                   | 11.16               | 11.16                   |                |                     | -14.6%                  |               |
| 2011                                                    | 65,919            | 10.88               | 12.23                   |                | -2.5%               | 9.6%                    |               |
| 2012                                                    | 165,275           | 9.89                | 13.28                   | 150.7%         | -9.1%               | 8.6%                    |               |
| 2013                                                    | 255,580           | 9.09                | 14.32                   | 54.6%          | -8.1%               | 7.8%                    | 2.9%          |

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## MEETING MINUTES

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**IN ATTENDANCE:** Ed Kurtz; Flint Emergency Financial Manager, City of Flint  
 Dayne Walling; Mayor, City of Flint  
 Mike Brown, City of Flint  
 John O'Brien, Genesee County  
 Howard Croft, City of Flint  
 Dwayne "Duffy" Johnson, City of Flint  
 Brent Wright, City of Flint  
 Awni Qaish, TYJT  
 Dave Guastella, TYJT

**DATE:** November 24, 2012

**PURPOSE OF MEETING:** Meeting with the City of Flint for the Indefinite-scope, Indefinite-delivery Contract Number 00383, 2012 Professional General Architectural/Engineering Services – City of Flint Water Supply Assessment

**PREPARED BY:** Dave Guastella

A meeting was held at the City of Flint Municipal Center on November 20, 2012 to discuss the water supply option being presented by the Karegnondi Water Authority (KWA) to the City of Flint. The main items discussed generally followed the attached KWA Discussion/Questions that were provided to City prior to the meeting. A summary of the key points discussed are provided below.

The questions submitted are repeated in the Discussion Items for easy reference. A summary of the action items generated from the meeting follow the Discussion Items.

### DISCUSSION ITEMS

1. Question/Discussion Item: Is the maximum day demand of 18 MGD for Flint the maximum day demand (MDD) throughout the 25 year planning period? If not, what is the 25 year projected MDD?

*KWA would supply up to 18 MGD. 18 MGD has been assumed as the maximum day demand and 12 MGD is assumed as the average day demand throughout the 25 year planning period.*

2. Question/Discussion Item: Copy of the intake contract documents and engineer's estimate.

The intake contract documents are approximately 90% complete and are not available for distribution. However, the updated Appendix 20, dated October 4, 2012 includes the most recent cost estimate of the intake based on the current design in process.

Comments: Meeting minutes were recorded based on the understanding of the author. Please contact the author within three days if you have any different understanding of the meeting. These minutes will be considered approved unless comments are provided within three days.

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3. Question/Discussion Item: Documentation of the Flint WTP improvements required and cost estimate.

*The costs are approximately \$7M as presented in the September 2009 Preliminary Engineering Report. However, this estimate has been updated. Some processes have been eliminated. John O'Brien will provide the updated costs and the description of the planned improvements to the plant.*

4. Question/Discussion Item: Confirm Flint's allocated percentage of the KWA capital improvements (30%?).

*Yes, the allocation is based on 18 MGD/60 MGD total capacity.*

5. Question/Discussion Item: Copy of the proposed KWA operating agreement for Flint.

*John O'Brien will provide the operating agreement as well as the Capacity Contract and Articles of Incorporation.*

6. Question/Discussion Item: What is the annual operating agreement adjustment projected for the 25 year planning period?

*This information is provided in Appendix 14, Table 14.2 of the September 2009 Preliminary Engineering Report. Operating cost based on Table 1. Used 12 MGD as average day demand (ADD). Assumed 5% as the annual increase in operating costs. John O'Brien indicated that these operating costs were based on Genesee County's operating costs. John O'Brien will provide the last 10 years of audited financial statements for the water fund.*

*To assess operating and maintenance costs for the Flint WTP, Duffy will provide multiple years of financial statements for the water fund. Duffy did not believe they had 10 years, but they will provide what they have.*

*Regarding operation and maintenance costs, Flint believes that these costs will increase by 2/3 of what they are now.*

7. Question/Discussion Item: Need the route of the pipelines and the locations of the facilities proposed. Purpose is to identify constraints that impact costs (i.e., utilities, environmental (e.g. wetlands), easements, etc.).

*KWA will not release the route due to concerns regarding speculation of land and easements. John O'Brien did indicate that the Lake Huron pump station would be at Fisher and M-25. The intermediate pump station site is near a location of the Lapeer/Sanilac/St. Clair border; where all three meet.*

8. Question/Discussion Item: KWA's initial charge to Flint is based on a 12 MGD average day demand. What is the basis of this number? Are there population projections and water use figures available that were used to determine the Flint demand for the 25 year planning period?

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*This was answered in Question No. 1 above.*

9. Question/Discussion Item: Is there a transition plan and cost during construction of the KWA system identified?

*Flint is looking for an agreement with DWSD for back-up supply from the 72-inch main at the Genesee border.*

10. Question/Discussion Item: The October 4, 2012 Preliminary Engineering Report Update states: "no backup power is planned for the pumps" (LHPS) and "No backup power is planned for pumping" (IPS). In case of power loss, how would Flint supply its customers?

*Flint indicated that they have adequate storage to supply the system for 6 to 7 days. Flint has 55 MG of storage and Genesee County has 65 MG for 2.5 days.*

11. Question/Discussion Item: The latest plan shows only a 5 million gallon ground reservoir is planned for balancing between LHPS and IPS. How is redundancy maintained?

*In cases of emergency, Flint indicated that the back-up for the KWA system will be the same as it is now with DWSD; they will use the Flint River as the source water. Flint currently operates their plant four times a year.*

*When questioned as to whether the WTP will be able to treat both lake water from the KWA system and river water Flint indicated that once the improvements identified in the September 2009 Preliminary Engineering Report are completed they will be able to accomplish both treatment processes. Flint will provide a schematic of the treatment trains at the WTP and a copy of the Flint transmission system.*

*Genesee County indicated that additional redundancy would also be provided from the new Genesee County WTP.*

*Regarding hydraulic transients; Genesee County indicated that a model analysis has not been included, but capital costs for mitigating transients have been included.*

12. Question/Discussion Item: Related to the construction cost:

- a. Does it include an additional traffic lane since the construction will occupy half the right of way? *Not required, all roads are county roads; however, there are a few State road crossings.*
- b. Does it include costs/fees for permit requirements such as inspection cost by the jurisdictional authorities? As a point of reference, the permit fee costs for the Flint Transmission System came out to be \$5.8 million. *Not required; all of the counties have waived any fees.*
- c. Does the cost of the steel pipe segments include corrosion protection measures such as

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anode stations and related O&M? Yes; however, the KWA has not settled on using steel pipe. PCCP pipe may be used. Steel shown in estimate because it is highest in cost and therefore the pricing is conservative.

- d. SCADA monitoring stations require power. Is the cost of bring power to the SCADA stations included? Again, as a point of reference for the Flint Transmission System we estimated \$800,000 for power to SCADA and valve operators. Yes, Genesee County did emphasize that the SCADA system will be simple and straightforward because a lot of controls are not required.
- e. Other items discussed at the meeting included:
  - The 2009 plant improvement cost is still good; however, there will be some reduction, such as a sulfuric chloride feed system that was eliminated. Plant capacity now is 36MGD, but will be 18 MGD.
  - The KWA Lake Huron Pumping Station (LHPS) is now only high lift pump station.
  - Genesee County will provide the distance of the intake pipe from the crib to the LHPS.
  - The intake project is almost ready to bid; waiting for the COE permit.
  - Genesee County is estimating the construction for the pipe lines and pump stations will begin July 2013.
  - The route has been flown for survey.
  - Genesee County is estimating construction will be complete and the project will be placed in service by Jan 2016.
  - Genesee County to provide a list of assumptions that the \$272 million cost estimate is based on since the route is now known.

13. The Flint River is identified as a backup: At what capacity? MDD or emergency supply?

*The Flint River would serve as a back up supply.*

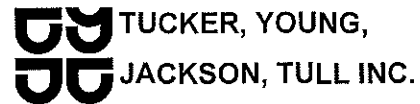
14. Where did the 40 years come from (Flint hostage to Detroit)? DWSD's new contracts are 30 years with openers to revise terms of supply (volume and pressure) after the first two years, then three years, and then in five year increments thereafter.

*The 40 years was stated in error. The reference was to DWSD's requirement to sign a 30 year contract.*

*After 40 years Flint will own 30% of the project and can sell their share of ownership if they want. Conversely, with DWSD, they continue to pay for the capital projects but have no ownership. Flint believes they will know what they will be charged for the next 25 years versus DWSD that can't commit to a fixed escalation.*

| <b>Action Items for Follow-up</b>                                                                               |                     |                         |
|-----------------------------------------------------------------------------------------------------------------|---------------------|-------------------------|
| <b>Items:</b>                                                                                                   | <b>Assigned To:</b> | <b>Date to Complete</b> |
| 1. Updated Costs for the Flint WTP Improvements and a description of the improvements.                          | John O'Brien        | 11/21/12                |
| 2. KWA Operating Agreement, Capacity Contract and Articles of Incorporation.                                    | John O'Brien        | 11/20/12                |
| 3. Provide the last 10 years of audited financial statements for the Genesee water fund.                        | John O'Brien        | 11/20/12                |
| 4. Provide multiple years of financial statements for the City of Flint water fund.                             | Duffy Johnson       | 11/26/12                |
| 5. Provide schematic of the Flint WTP and a map of the Flint transmission system.                               | Brent Wright        | 11/26/12                |
| 6. Provide the length of the intake pipe from the crib to the pump station.                                     | John O'Brien        | 11/20/12                |
| 7. Provide a list of assumptions that the \$272 million cost estimate is based on since the route is now known. | John O'Brien        | 11/26/12                |

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CONSULTING ENGINEERS-PLANNERS  
565 E. Larned Suite 300  
Detroit, Michigan 48226  
(313)963-0612 FAX (313)963-2156

**Indefinite-scope, Indefinite-delivery Contract Number 00383  
2012 Professional General Architectural/Engineering Services**

**CITY OF FLINT WATER SUPPLY ASSESSMENT**

KWA Discussion/Questions for the November 20, 2012 Meeting

1. Is the maximum day demand of 18 MGD for Flint the maximum day demand (MDD) throughout the 25 year planning period? If not, what is the 25 year projected MDD?
2. Copy of the intake contract documents and engineer's estimate.
3. Documentation of the Flint WTP improvements required and cost estimate.
4. Confirm Flint's allocated percentage of the KWA capital improvements (30%).
5. Copy of the proposed KWA operating agreement for Flint.
6. What is the annual operating agreement adjustment projected for the 25 year planning period?
7. Need the route of the pipelines and the locations of the facilities proposed. Purpose is to identify constraints that impact costs (i.e., utilities, environmental (e.g. wetlands), easements, etc.).
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9. Is there a transition plan and cost during construction of the KWA system identified?
10. The October 4, 2012 Preliminary Engineering Report Update states: "no backup power is planned for the pumps" (LHPS) and "No backup power is planned for pumping" (IPS). In case of power loss, how would Flint supply its customers?
11. The latest plan shows only a 5 million gallon ground reservoir is planned for balancing between LHPS and IPS. How is redundancy maintained?
12. Related to the construction cost:
  - a. Does it include an additional traffic lane since the construction will occupy half the right of way?
  - b. Does it include costs/fees for permit requirements such as inspection cost by the jurisdictional authorities? As a point of reference, the permit fee costs for the Flint Transmission System came out to be \$5.8 million.

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- 
- c. Does the cost of the steel pipe segments include corrosion protection measures such as anode stations and related O&M?
  - d. SCADA monitoring stations require power. Is the cost of bring power to the SCADA stations included? Again, as a point of reference the for the Flint Transmission System we estimated \$800,000 for power to SCADA and valve operators.
13. The Flint River is identified as a backup: At what capacity? MDD or emergency supply?
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STATE OF MICHIGAN CONTRACT NO. 271N3200089

CITY OF FLINT WATER SUPPLY ASSESSMENT

State of Michigan, Department of Treasury

**Appendix B: Cost Worksheets**

## DWSD Worksheet : 18 MGD Maximum Day Customer with Model Contract at Potter &amp; Baxter

|                                             |  |  |  |  | Water |               | Revenue        | Interest   |               |               |
|---------------------------------------------|--|--|--|--|-------|---------------|----------------|------------|---------------|---------------|
|                                             |  |  |  |  | Year  | Flint WTP O&M | Purchase       | Bond       | on            | TOTAL         |
| <u>Capacity</u>                             |  |  |  |  |       |               |                | Payment    | Reserve       |               |
| Flint ADD: 0.60 MGD 81 MCF/Day              |  |  |  |  | 1     | 2013          | \$ 3,538,214   | 9,585,642  | -             | \$ 13,123,856 |
| DWSD ADD: 12 MGD 1,604 MCF/Day              |  |  |  |  | 2     | 2014          | \$ 3,697,788   | 10,036,167 | -             | \$ 13,733,955 |
|                                             |  |  |  |  | 3     | 2015          | \$ 3,864,558   | 10,507,867 | -             | \$ 14,372,425 |
| <u>Annual Volume</u>                        |  |  |  |  | 4     | 2016          | \$ 4,038,850   | 11,001,736 | -             | \$ 15,040,586 |
| Flint: 29,412 MCF                           |  |  |  |  | 5     | 2017          | \$ 4,221,002   | 11,518,818 | -             | \$ 15,739,820 |
| DWSD: 585,561 MCF                           |  |  |  |  | 6     | 2018          | \$ 4,411,369   | 12,060,203 | -             | \$ 16,471,571 |
|                                             |  |  |  |  | 7     | 2019          | \$ 4,610,322   | 12,627,032 | -             | \$ 17,237,354 |
| <u>2013 Cost of Supply</u>                  |  |  |  |  | 8     | 2020          | \$ 4,818,247   | 13,220,503 | -             | \$ 18,038,750 |
| Flint WTP O&M: 120.30 /MCF \$ 3,538,214 /Yr |  |  |  |  | 9     | 2021          | \$ 5,035,550   | 13,841,866 | -             | \$ 18,877,416 |
| DWSD: \$ 16.37 /MCF \$ 9,585,642 /Yr        |  |  |  |  | 10    | 2022          | \$ 5,262,653   | 14,492,434 | -             | \$ 19,755,087 |
|                                             |  |  |  |  | 11    | 2023          | \$ 5,499,999   | 15,173,578 | -             | \$ 20,673,577 |
|                                             |  |  |  |  | 12    | 2024          | \$ 5,748,049   | 15,886,736 | -             | \$ 21,634,785 |
| <u>Escalation/Inflation Rate</u>            |  |  |  |  | 13    | 2025          | \$ 6,007,286   | 16,633,413 | -             | \$ 22,640,699 |
| Flint: 4.51% /Yr                            |  |  |  |  | 14    | 2026          | \$ 6,278,215   | 17,415,183 | -             | \$ 23,693,398 |
| DWSD: 4.7% /Yr                              |  |  |  |  | 15    | 2027          | \$ 6,561,362   | 18,239,697 | -             | \$ 24,795,059 |
|                                             |  |  |  |  | 16    | 2028          | \$ 6,857,279   | 19,090,681 | -             | \$ 25,947,960 |
|                                             |  |  |  |  | 17    | 2029          | \$ 7,166,543   | 19,987,943 | -             | \$ 27,154,486 |
| <u>Capital Expenditure</u>                  |  |  |  |  | 18    | 2030          | \$ 7,489,754   | 20,927,376 | -             | \$ 28,417,130 |
| Amount: \$ -                                |  |  |  |  | 19    | 2031          | \$ 7,827,542   | 21,910,963 | -             | \$ 29,738,505 |
| Reserve: \$ - 0% Reserve Rate: 0.00%        |  |  |  |  | 20    | 2032          | \$ 8,180,564   | 22,940,778 | -             | \$ 31,121,342 |
| Amount plus Reserve: \$ -                   |  |  |  |  | 21    | 2033          | \$ 8,549,507   | 24,018,995 | -             | \$ 32,568,502 |
| Revenue Bond Rate: 5%                       |  |  |  |  | 22    | 2034          | \$ 8,935,090   | 25,147,887 | -             | \$ 34,082,977 |
| Number of Years: 25                         |  |  |  |  | 23    | 2035          | \$ 9,338,063   | 26,329,838 | -             | \$ 35,667,901 |
| Annual Cost: \$0                            |  |  |  |  | 24    | 2036          | \$ 9,759,209   | 27,567,341 | -             | \$ 37,326,550 |
|                                             |  |  |  |  | 25    | 2037          | \$ 10,199,350  | 28,863,006 | -             | \$ 39,062,355 |
|                                             |  |  |  |  | 2038  | \$ 10,659,340 | 30,219,567     | -          | \$ 40,878,907 |               |
|                                             |  |  |  |  | 2039  | \$ 11,140,076 | 31,639,886     | -          | \$ 42,779,963 |               |
|                                             |  |  |  |  | 2040  | \$ 11,642,494 | 33,126,961     | -          | \$ 44,769,455 |               |
|                                             |  |  |  |  | 2041  | \$ 12,167,570 | 34,683,928     | -          | \$ 46,851,499 |               |
|                                             |  |  |  |  | 2042  | \$ 12,716,328 | 36,314,073     | -          | \$ 49,030,401 |               |
|                                             |  |  |  |  |       |               | \$ 216,222,171 |            |               |               |

DWSD 18 MGD Maximum Day Customer at Potter & Baxter

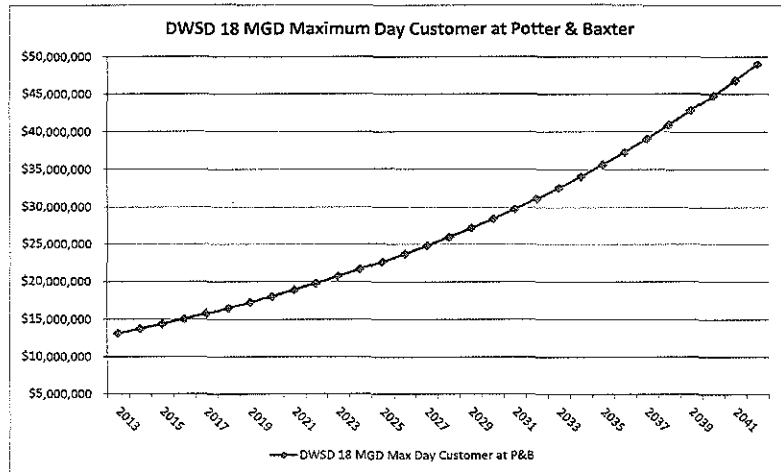
1,000,000

25 Yrs Cumulative

\$ 596,916,044

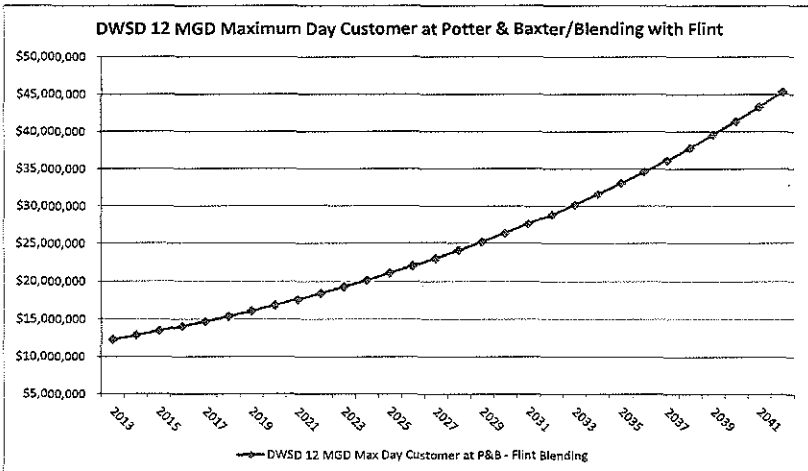
30 Yrs Cumulative

\$ 821,226,268



## DWSD Worksheet : 12 MGD Maximum Day Customer with Model Contract at Potter &amp; Baxter/Blending with Flint

|                                  |               |                        |    | Year | Flint WTP<br>O&M | Water<br>Purchase | Revenue<br>Bond<br>Payment | Interest on<br>Reserve | TOTAL         |
|----------------------------------|---------------|------------------------|----|------|------------------|-------------------|----------------------------|------------------------|---------------|
| <u>Capacity</u>                  |               |                        |    |      |                  |                   |                            |                        |               |
| Flint ADD:                       | 4 MGD         | 535 MCF/Day            | 1  | 2013 | \$ 5,895,097     | 6,367,005         | -                          | -                      | \$ 12,262,103 |
| DWSD ADD:                        | 8 MGD         | 1,070 MCF/Day          | 2  | 2014 | \$ 6,160,966     | 6,666,255         | -                          | -                      | \$ 12,827,221 |
|                                  |               |                        |    | 3    | 2015             | \$ 6,438,826      | 6,979,569                  | -                      | \$ 13,418,395 |
| <u>Annual Volume</u>             |               |                        |    | 4    | 2016             | \$ 6,729,217      | 7,307,608                  | -                      | \$ 14,036,825 |
| Flint:                           | 195,187 MCF   | 195187.1658            | 5  | 2017 | \$ 7,032,705     | 7,651,066         | -                          | -                      | \$ 14,683,771 |
| DWSD:                            | 390,374 MCF   |                        | 6  | 2018 | \$ 7,349,880     | 8,010,666         | -                          | -                      | \$ 15,360,546 |
|                                  |               |                        |    | 7    | 2019             | \$ 7,681,359      | 8,387,167                  | -                      | \$ 16,068,527 |
| <u>2013 Cost of Supply</u>       |               |                        |    | 8    | 2020             | \$ 8,027,789      | 8,781,364                  | -                      | \$ 16,809,153 |
| Flint WTP O&M:                   | \$ 30.20 /MCF | \$ 5,895,097 /Yr       | 9  | 2021 | \$ 8,389,842     | 9,194,088         | -                          | -                      | \$ 17,583,930 |
| DWSD:                            | \$ 16.31 /MCF | \$ 6,367,005 /Yr       | 10 | 2022 | \$ 8,768,224     | 9,626,210         | -                          | -                      | \$ 18,394,434 |
| <u>Escalation/Inflation Rate</u> |               |                        |    | 11   | 2023             | \$ 9,163,671      | 10,078,642                 | -                      | \$ 19,242,313 |
| Flint:                           | 4.51% /Yr     |                        | 12 | 2024 | \$ 9,576,952     | 10,552,338        | -                          | -                      | \$ 20,129,291 |
| DWSD:                            | 4.7% /Yr      |                        | 13 | 2025 | \$ 10,008,873    | 11,048,298        | -                          | -                      | \$ 21,057,171 |
| <u>Capital Expenditure</u>       |               |                        |    | 14   | 2026             | \$ 10,460,273     | 11,567,568                 | -                      | \$ 22,027,841 |
| Amount:                          | \$ -          |                        | 15 | 2027 | \$ 10,932,031    | 12,111,244        | -                          | -                      | \$ 23,043,275 |
| Reserve:                         | \$ -          | 0% Reserve Rate: 0.00% | 16 | 2028 | \$ 11,425,066    | 12,680,473        | -                          | -                      | \$ 24,105,538 |
| Amount plus Reserve:             | \$ -          |                        | 17 | 2029 | \$ 11,940,336    | 13,276,455        | -                          | -                      | \$ 25,216,791 |
| Revenue Bond Rate:               | 5%            |                        | 18 | 2030 | \$ 12,478,845    | 13,900,448        | -                          | -                      | \$ 26,379,294 |
| Number of Years:                 | 25            |                        | 19 | 2031 | \$ 13,041,641    | 14,553,769        | -                          | -                      | \$ 27,595,410 |
| Annual Cost:                     | \$0           |                        | 20 | 2032 | \$ 13,629,819    | 15,237,796        | -                          | -                      | \$ 28,867,616 |
|                                  |               |                        |    | 21   | 2033             | \$ 14,244,524     | 15,953,973                 | -                      | \$ 30,198,497 |
|                                  |               |                        |    | 22   | 2034             | \$ 14,886,952     | 16,703,810                 | -                      | \$ 31,590,762 |
|                                  |               |                        |    | 23   | 2035             | \$ 15,558,354     | 17,488,889                 | -                      | \$ 33,047,242 |
|                                  |               |                        |    | 24   | 2036             | \$ 16,260,035     | 18,310,866                 | -                      | \$ 34,570,902 |
|                                  |               |                        |    | 25   | 2037             | \$ 16,993,363     | 19,171,477                 | -                      | \$ 36,164,840 |
|                                  |               |                        |    | 2038 | \$ 17,759,764    | 20,072,597        | -                          | -                      | \$ 37,832,300 |
|                                  |               |                        |    | 2039 | \$ 18,560,729    | 21,015,946        | -                          | -                      | \$ 39,576,675 |
|                                  |               |                        |    | 2040 | \$ 19,397,818    | 22,003,695        | -                          | -                      | \$ 41,401,513 |
|                                  |               |                        |    | 2041 | \$ 20,272,660    | 23,037,869        | -                          | -                      | \$ 43,310,528 |
|                                  |               |                        |    | 2042 | \$ 21,186,956    | 24,120,649        | -                          | -                      | \$ 45,307,605 |



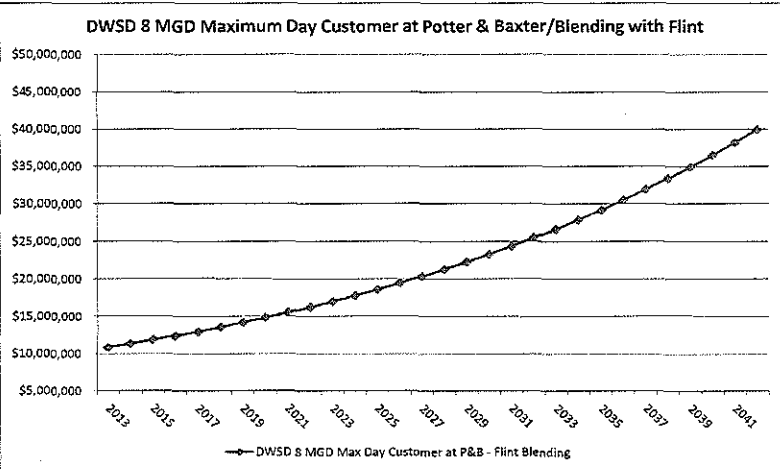
**25 Yrs Cumulative**  
\$ 554,681,686

**30 Yrs Cumulative**  
\$ 762,110,308



## DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Potter &amp; Baxter/Blending with Flint

| Capacity                  | Flint ADD:           | 4 MGD         | 535 MCF/Day            | 1  | Year | Flint WTP O&M | Water Purchase | Revenue Bond Payment | Interest on Reserve | TOTAL         |
|---------------------------|----------------------|---------------|------------------------|----|------|---------------|----------------|----------------------|---------------------|---------------|
|                           | DWSD ADD:            | 8 MGD         | 1,070 MCF/Day          | 2  | 2013 | \$ 5,895,097  | 4,949,947      | -                    | -                   | \$ 10,845,044 |
|                           |                      |               |                        | 3  | 2014 | \$ 6,160,966  | 5,182,594      | -                    | -                   | \$ 11,343,560 |
|                           |                      |               |                        | 4  | 2015 | \$ 6,438,826  | 5,426,176      | -                    | -                   | \$ 11,865,002 |
| Annual Volume             | Flint:               | 195,187 MCF   |                        | 5  | 2016 | \$ 6,729,217  | 5,681,206      | -                    | -                   | \$ 12,410,423 |
|                           | DWSD:                | 390,374 MCF   |                        | 6  | 2017 | \$ 7,032,705  | 5,948,223      | -                    | -                   | \$ 12,980,928 |
|                           |                      |               |                        | 7  | 2018 | \$ 7,349,880  | 6,227,789      | -                    | -                   | \$ 13,577,669 |
|                           |                      |               |                        | 8  | 2019 | \$ 7,681,359  | 6,520,495      | -                    | -                   | \$ 14,201,855 |
| 2013 Cost of Supply       |                      |               |                        | 9  | 2020 | \$ 8,027,789  | 6,826,959      | -                    | -                   | \$ 14,854,747 |
|                           | Flint WTP O&M:       | \$ 30.20 /MCF | \$ 5,895,097 /Yr       | 10 | 2021 | \$ 8,389,842  | 7,147,826      | -                    | -                   | \$ 15,537,668 |
|                           | DWSD:                | \$ 12.68 /MCF | \$ 4,949,947 /Yr       | 11 | 2022 | \$ 8,768,224  | 7,483,774      | -                    | -                   | \$ 16,251,997 |
|                           |                      |               |                        | 12 | 2023 | \$ 9,163,671  | 7,835,511      | -                    | -                   | \$ 16,999,182 |
| Escalation/Inflation Rate |                      |               |                        | 13 | 2024 | \$ 9,576,952  | 8,203,780      | -                    | -                   | \$ 17,780,732 |
|                           | Flint:               | 4.51% /Yr     |                        | 14 | 2025 | \$ 10,008,873 | 8,589,358      | -                    | -                   | \$ 18,598,230 |
|                           | DWSD:                | 4.7% /Yr      |                        | 15 | 2026 | \$ 10,460,273 | 8,993,057      | -                    | -                   | \$ 19,453,330 |
|                           |                      |               |                        | 16 | 2027 | \$ 10,932,031 | 9,415,731      | -                    | -                   | \$ 20,347,762 |
|                           |                      |               |                        | 17 | 2028 | \$ 11,425,066 | 9,858,271      | -                    | -                   | \$ 21,283,336 |
| Capital Expenditure       |                      |               |                        | 18 | 2029 | \$ 11,940,336 | 10,321,609     | -                    | -                   | \$ 22,261,945 |
|                           | Amount:              | \$ -          |                        | 19 | 2030 | \$ 12,478,845 | 10,806,725     | -                    | -                   | \$ 23,285,570 |
|                           | Reserve:             | \$ -          | 0% Reserve Rate: 0.00% | 20 | 2031 | \$ 13,041,641 | 11,314,641     | -                    | -                   | \$ 24,356,282 |
|                           | Amount plus Reserve: | \$ -          |                        | 21 | 2032 | \$ 13,629,819 | 11,846,429     | -                    | -                   | \$ 25,476,248 |
|                           | Revenue Bond Rate:   | 5%            |                        | 22 | 2033 | \$ 14,244,524 | 12,403,211     | -                    | -                   | \$ 26,647,735 |
|                           | Number of Years:     | 25            |                        | 23 | 2034 | \$ 14,886,952 | 12,986,162     | -                    | -                   | \$ 27,873,114 |
|                           | Annual Cost:         | \$0           |                        | 24 | 2035 | \$ 15,558,354 | 13,596,512     | -                    | -                   | \$ 29,154,866 |
|                           |                      |               |                        | 25 | 2036 | \$ 16,260,035 | 14,235,548     | -                    | -                   | \$ 30,495,583 |
|                           |                      |               |                        |    | 2037 | \$ 16,993,363 | 14,904,619     | -                    | -                   | \$ 31,897,982 |
|                           |                      |               |                        |    | 2038 | \$ 17,759,764 | 15,605,136     | -                    | -                   | \$ 33,364,899 |
|                           |                      |               |                        |    | 2039 | \$ 18,560,729 | 16,338,577     | -                    | -                   | \$ 34,899,306 |
|                           |                      |               |                        |    | 2040 | \$ 19,397,818 | 17,106,490     | -                    | -                   | \$ 36,504,308 |
|                           |                      |               |                        |    | 2041 | \$ 20,272,660 | 17,910,495     | -                    | -                   | \$ 38,183,155 |
|                           |                      |               |                        |    | 2042 | \$ 21,186,956 | 18,752,288     | -                    | -                   | \$ 39,939,245 |

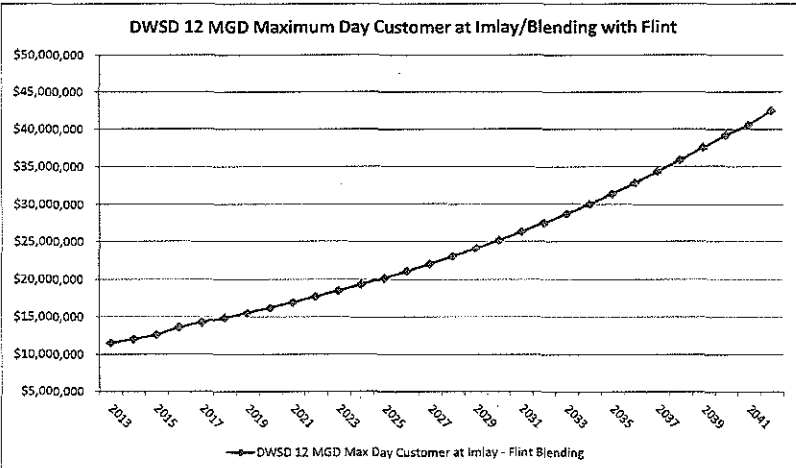


**25 Yrs Cumulative**  
\$ 489,780,792

**30 Yrs Cumulative**  
\$ 672,671,705

## DWSD Worksheet : 12 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

|                                  |               |                  |                                   | Year | Flint WTP<br>O&M | Water<br>Purchase | Revenue<br>Bond<br>Payment | Interest<br>on<br>Reserve | TOTAL         |
|----------------------------------|---------------|------------------|-----------------------------------|------|------------------|-------------------|----------------------------|---------------------------|---------------|
| <u>Capacity</u>                  |               |                  |                                   |      |                  |                   |                            |                           |               |
| Flint ADD:                       | 4 MGD         | 535 MCF/Day      |                                   | 1    | 2013             | \$ 5,895,097      | 5,613,583                  | 19,500                    | \$ 11,489,180 |
| DWSD ADD:                        | 8 MGD         | 1,070 MCF/Day    |                                   | 2    | 2014             | \$ 6,160,966      | 5,877,421                  | 19,500                    | \$ 12,018,888 |
|                                  |               |                  |                                   | 3    | 2015             | \$ 6,438,826      | 6,153,660                  | 19,500                    | \$ 12,572,986 |
| <u>Annual Volume</u>             |               |                  |                                   | 4    | 2016             | \$ 6,729,217      | 6,442,882                  | 462,610                   | \$ 13,615,209 |
| Flint:                           | 195,187 MCF   |                  |                                   | 5    | 2017             | \$ 7,032,705      | 6,745,698                  | 462,610                   | \$ 14,221,512 |
| DWSD:                            | 390,374 MCF   |                  |                                   | 6    | 2018             | \$ 7,349,880      | 7,062,745                  | 462,610                   | \$ 14,855,735 |
|                                  |               |                  |                                   | 7    | 2019             | \$ 7,681,959      | 7,394,694                  | 462,610                   | \$ 15,519,164 |
| <u>2013 Cost of Supply</u>       |               |                  |                                   | 8    | 2020             | \$ 8,027,789      | 7,742,245                  | 462,610                   | \$ 16,213,144 |
| Flint WTP O&M:                   | \$ 30.20 /MCF | \$ 5,895,097 /Yr |                                   | 9    | 2021             | \$ 8,389,842      | 8,106,131                  | 462,610                   | \$ 16,939,082 |
| DWSD:                            | \$ 14.38 /MCF | \$ 5,613,583 /Yr |                                   | 10   | 2022             | \$ 8,768,224      | 8,487,119                  | 462,610                   | \$ 17,698,452 |
|                                  |               |                  |                                   | 11   | 2023             | \$ 9,163,671      | 8,886,013                  | 462,610                   | \$ 18,492,794 |
| <u>Escalation/Inflation Rate</u> |               |                  |                                   | 12   | 2024             | \$ 9,576,952      | 9,303,656                  | 462,610                   | \$ 19,323,718 |
| Flint:                           | 4.51% /Yr     |                  |                                   | 13   | 2025             | \$ 10,008,873     | 9,740,928                  | 462,610                   | \$ 20,192,910 |
| DWSD:                            | 4.7% /Yr      |                  |                                   | 14   | 2026             | \$ 10,460,273     | 10,198,751                 | 462,610                   | \$ 21,102,134 |
|                                  |               |                  |                                   | 15   | 2027             | \$ 10,932,031     | 10,678,093                 | 462,610                   | \$ 22,053,234 |
| <u>Capital Expenditure</u>       |               |                  |                                   | 16   | 2028             | \$ 11,425,066     | 11,179,963                 | 462,610                   | \$ 23,048,139 |
| Capital:                         | \$ 4,700,000  |                  |                                   | 17   | 2029             | \$ 11,940,338     | 11,705,421                 | 462,610                   | \$ 24,088,867 |
| Bond Issuance (3% of Total):     | 195,000       | Check:           | 3.0%                              | 18   | 2030             | \$ 12,478,845     | 12,255,576                 | 462,610                   | \$ 25,177,531 |
| 3 Years of Capitalized Interest: | 975,000       | Check:           | 5.0% /Yr (Bond Interest on Total) | 19   | 2031             | \$ 13,041,641     | 12,831,588                 | 462,610                   | \$ 26,316,339 |
| Reserve (10% of Total):          | 650,000       | Check:           | 10.0%                             | 20   | 2032             | \$ 13,629,819     | 13,434,673                 | 462,610                   | \$ 27,507,602 |
| Total:                           | \$ 6,520,000  |                  |                                   | 21   | 2033             | \$ 14,244,524     | 14,066,102                 | 462,610                   | \$ 28,753,736 |
| Revenue Bond Rate:               | 5%            |                  |                                   | 22   | 2034             | \$ 14,886,952     | 14,727,209                 | 462,610                   | \$ 30,057,271 |
| Number of Years:                 | 25            |                  |                                   | 23   | 2035             | \$ 15,558,354     | 15,419,388                 | 462,610                   | \$ 31,420,852 |
| Annual Cost:                     | \$462,610     |                  |                                   | 24   | 2036             | \$ 16,260,035     | 16,144,099                 | 462,610                   | \$ 32,847,245 |
| Interest on Reserve:             | 3%            |                  |                                   | 25   | 2037             | \$ 16,993,363     | 16,902,872                 | 462,610                   | \$ 34,339,345 |
|                                  |               |                  |                                   | 2038 | \$ 17,759,764    | 17,697,307        | 462,610                    | 19,500                    | \$ 35,900,181 |
|                                  |               |                  |                                   | 2039 | \$ 18,560,729    | 18,529,080        | 462,610                    | 19,500                    | \$ 37,532,919 |
|                                  |               |                  |                                   | 2040 | \$ 19,397,818    | 19,399,947        | 462,610                    | 19,500                    | \$ 39,240,875 |
|                                  |               |                  |                                   | 2041 | \$ 20,272,660    | 20,311,745        |                            |                           | \$ 40,584,404 |
|                                  |               |                  |                                   | 2042 | \$ 21,186,956    | 21,266,397        |                            |                           | \$ 42,453,353 |

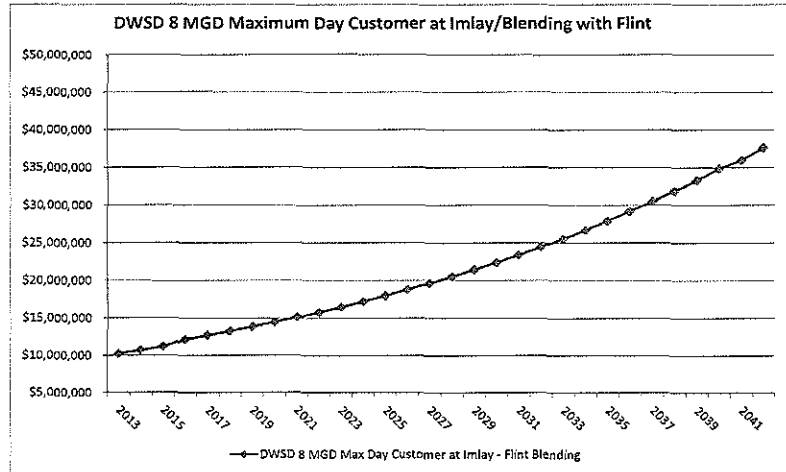


**25 Yrs Cumulative**  
\$ 529,865,071

**30 Yrs Cumulative**  
\$ 725,576,803

## DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

|                                  |              |        |                                   | Year | Flint WTP<br>O&M | Water<br>Purchase | Revenue<br>Bond<br>Payment | Interest on<br>Reserve | TOTAL         |
|----------------------------------|--------------|--------|-----------------------------------|------|------------------|-------------------|----------------------------|------------------------|---------------|
| <u>Capacity</u>                  |              |        |                                   |      |                  |                   |                            |                        |               |
| Flint ADD:                       | 4            | MGD    | 535 MCF/Day                       | 1    | 2013             | \$ 5,895,097      | 4,337,059                  | 19,500                 | \$ 10,212,656 |
| DWSD ADD:                        | 8            | MGD    | 1,070 MCF/Day                     | 2    | 2014             | \$ 6,160,966      | 4,540,901                  | 19,500                 | \$ 10,682,367 |
| <u>Annual Volume</u>             |              |        |                                   | 3    | 2015             | \$ 6,438,826      | 4,754,323                  | 19,500                 | \$ 11,173,649 |
| Flint:                           | 195,187      | MCF    |                                   | 4    | 2016             | \$ 6,729,217      | 4,977,776                  | 19,500                 | \$ 12,150,103 |
| DWSD:                            | 390,374      | MCF    |                                   | 5    | 2017             | \$ 7,032,705      | 5,211,732                  | 19,500                 | \$ 12,687,546 |
| <u>2013 Cost of Supply</u>       |              |        |                                   | 6    | 2018             | \$ 7,349,880      | 5,456,683                  | 19,500                 | \$ 13,249,673 |
| Flint WTP O&M:                   | \$ 30.20     | /MCF   | \$ 5,895,097 /Yr                  | 7    | 2019             | \$ 7,681,359      | 5,713,147                  | 19,500                 | \$ 13,837,616 |
| DWSD:                            | \$ 11.11     | /MCF   | \$ 4,337,059 /Yr                  | 8    | 2020             | \$ 8,027,789      | 5,981,665                  | 19,500                 | \$ 14,452,564 |
| <u>Escalation/Inflation Rate</u> |              |        |                                   | 9    | 2021             | \$ 8,389,842      | 6,262,803                  | 19,500                 | \$ 15,095,755 |
| Flint:                           | 4.51%        | /Yr    |                                   | 10   | 2022             | \$ 8,768,224      | 6,557,155                  | 19,500                 | \$ 15,768,489 |
| DWSD:                            | 4.7%         | /Yr    |                                   | 11   | 2023             | \$ 9,163,671      | 6,865,341                  | 19,500                 | \$ 16,472,122 |
| <u>Capital Expenditure</u>       |              |        |                                   | 12   | 2024             | \$ 9,576,952      | 7,188,012                  | 19,500                 | \$ 17,208,074 |
| Capital:                         | \$ 4,700,000 |        |                                   | 13   | 2025             | \$ 10,008,873     | 7,525,849                  | 19,500                 | \$ 17,977,832 |
| Bond Issuance (3% of Total):     | 195,000      | Check: | 3.0%                              | 14   | 2026             | \$ 10,460,273     | 7,879,564                  | 19,500                 | \$ 18,782,947 |
| 3 Years of Capitalized Interest: | 975,000      | Check: | 5.0% /Yr (Bond Interest on Total) | 15   | 2027             | \$ 10,932,031     | 8,249,903                  | 19,500                 | \$ 19,625,044 |
| Reserve (10% of Total):          | 650,000      | Check: | 10.0%                             | 16   | 2028             | \$ 11,425,066     | 8,637,649                  | 19,500                 | \$ 20,505,824 |
| Total:                           | \$ 6,520,000 |        |                                   | 17   | 2029             | \$ 11,940,336     | 9,043,618                  | 19,500                 | \$ 21,427,064 |
| Revenue Bond Rate:               | 5%           |        |                                   | 18   | 2030             | \$ 12,478,845     | 9,468,668                  | 19,500                 | \$ 22,390,624 |
| Number of Years:                 | 25           |        |                                   | 19   | 2031             | \$ 13,041,641     | 9,913,696                  | 19,500                 | \$ 23,398,447 |
| Annual Cost:                     | \$462,610    |        |                                   | 20   | 2032             | \$ 13,629,819     | 10,379,639                 | 19,500                 | \$ 24,452,569 |
| Interest on Reserve:             | 3%           |        |                                   | 21   | 2033             | \$ 14,244,524     | 10,867,482                 | 19,500                 | \$ 25,555,117 |
|                                  |              |        |                                   | 22   | 2034             | \$ 14,886,952     | 11,378,254                 | 19,500                 | \$ 26,708,316 |
|                                  |              |        |                                   | 23   | 2035             | \$ 15,558,354     | 11,913,032                 | 19,500                 | \$ 27,914,496 |
|                                  |              |        |                                   | 24   | 2036             | \$ 16,260,035     | 12,472,945                 | 19,500                 | \$ 29,176,090 |
|                                  |              |        |                                   | 25   | 2037             | \$ 16,993,363     | 13,059,173                 | 19,500                 | \$ 30,485,646 |
|                                  |              |        |                                   |      | 2038             | \$ 17,759,764     | 13,672,954                 | 19,500                 | \$ 31,875,828 |
|                                  |              |        |                                   |      | 2039             | \$ 18,560,729     | 14,315,583                 | 19,500                 | \$ 33,319,422 |
|                                  |              |        |                                   |      | 2040             | \$ 19,397,818     | 14,988,415                 | 19,500                 | \$ 34,829,343 |
|                                  |              |        |                                   |      | 2041             | \$ 20,272,660     | 15,692,871                 |                        | \$ 35,965,530 |
|                                  |              |        |                                   |      | 2042             | \$ 21,186,956     | 16,430,436                 |                        | \$ 37,617,392 |

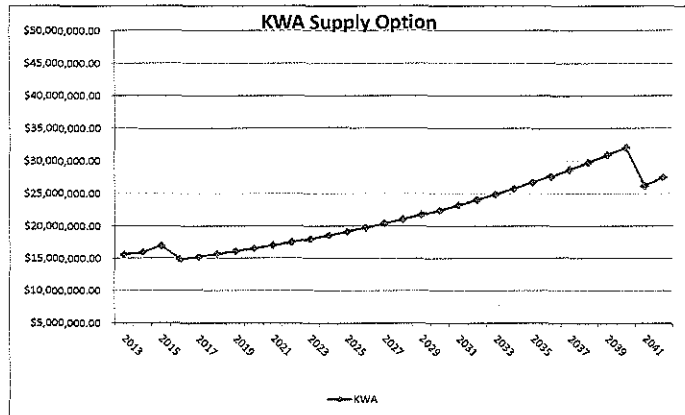


**KWA Supply Option Worksheet**  
KWA 10/31/12 No Overruns

|    | Year | DWSD & Flint<br>WTP Costs | KWA Entry<br>Fee | KWA Debt<br>service | Flint WTP<br>Debt Service | KWA<br>Operations | Flint WTP<br>Operations<br>with KWA | TOTAL         |
|----|------|---------------------------|------------------|---------------------|---------------------------|-------------------|-------------------------------------|---------------|
| 1  | 2013 | \$ 14,413,858             | 1,162,800        |                     |                           |                   |                                     | \$ 15,576,658 |
| 2  | 2014 | \$ 15,355,135             | 581,400          |                     |                           |                   |                                     | \$ 15,936,535 |
| 3  | 2015 | \$ 16,365,534             | 581,400          |                     |                           |                   |                                     | \$ 16,946,934 |
| 4  | 2016 |                           |                  | 6,593,155           | 572,781                   | 878,869           | 5,843,344                           | \$ 14,888,149 |
| 5  | 2017 |                           |                  | 6,593,155           | 572,781                   | 922,812           | 7,185,511                           | \$ 15,274,260 |
| 6  | 2018 |                           |                  | 6,593,155           | 572,781                   | 968,953           | 7,544,787                           | \$ 15,679,676 |
| 7  | 2019 |                           |                  | 6,593,155           | 572,781                   | 1,017,401         | 7,922,026                           | \$ 16,105,363 |
| 8  | 2020 |                           |                  | 6,593,155           | 572,781                   | 1,068,271         | 8,318,127                           | \$ 16,552,334 |
| 9  | 2021 |                           |                  | 6,593,155           | 572,781                   | 1,121,684         | 8,734,034                           | \$ 17,021,654 |
| 10 | 2022 |                           |                  | 6,593,155           | 572,781                   | 1,177,769         | 9,170,735                           | \$ 17,514,440 |
| 11 | 2023 |                           |                  | 6,593,155           | 572,781                   | 1,236,657         | 9,629,272                           | \$ 18,031,865 |
| 12 | 2024 |                           |                  | 6,593,155           | 572,781                   | 1,298,490         | 10,110,736                          | \$ 18,575,162 |
| 13 | 2025 |                           |                  | 6,593,155           | 572,781                   | 1,363,414         | 10,616,273                          | \$ 19,145,623 |
| 14 | 2026 |                           |                  | 6,593,155           | 572,781                   | 1,431,585         | 11,147,086                          | \$ 19,744,607 |
| 15 | 2027 |                           |                  | 6,593,155           | 572,781                   | 1,503,164         | 11,704,441                          | \$ 20,373,541 |
| 16 | 2028 |                           |                  | 6,593,155           | 572,781                   | 1,578,322         | 12,289,663                          | \$ 21,033,921 |
| 17 | 2029 |                           |                  | 6,593,155           | 572,781                   | 1,657,239         | 12,904,146                          | \$ 21,727,320 |
| 18 | 2030 |                           |                  | 6,593,155           | 572,781                   | 1,740,101         | 13,549,353                          | \$ 22,455,390 |
| 19 | 2031 |                           |                  | 6,593,155           | 572,781                   | 1,827,106         | 14,226,821                          | \$ 23,219,862 |
| 20 | 2032 |                           |                  | 6,593,155           | 572,781                   | 1,918,461         | 14,938,162                          | \$ 24,022,559 |
| 21 | 2033 |                           |                  | 6,593,155           | 572,781                   | 2,014,384         | 15,685,070                          | \$ 24,865,390 |
| 22 | 2034 |                           |                  | 6,593,155           | 572,781                   | 2,115,103         | 16,469,323                          | \$ 25,750,362 |
| 23 | 2035 |                           |                  | 6,593,155           | 572,781                   | 2,220,858         | 17,292,789                          | \$ 26,679,584 |
| 24 | 2036 |                           |                  | 6,593,155           | 572,781                   | 2,331,901         | 18,157,429                          | \$ 27,655,266 |
| 25 | 2037 |                           |                  | 6,593,155           | 572,781                   | 2,448,496         | 19,065,300                          | \$ 28,679,733 |
|    | 2038 |                           |                  | 6,593,155           | 572,781                   | 2,570,921         | 20,018,565                          | \$ 29,755,422 |
|    | 2039 |                           |                  | 6,593,155           | 572,781                   | 2,699,467         | 21,019,494                          | \$ 30,884,897 |
|    | 2040 |                           |                  | 6,593,155           | 572,781                   | 2,834,440         | 22,070,468                          | \$ 32,070,845 |
|    | 2041 |                           |                  |                     |                           | 2,976,162         | 23,173,992                          | \$ 26,150,154 |
|    | 2042 |                           |                  |                     |                           | 3,124,970         | 24,332,691                          | \$ 27,457,662 |

**25 Yrs Cumulative**  
\$ 503,456,186

**30 Yrs Cumulative**  
\$ 649,775,166



# KWA Supply Option Worksheet KWA-1

|                     |                |             |               |
|---------------------|----------------|-------------|---------------|
| Capacity            | Flint ADD:     | 12 MGD      | 1,604 MCF/Day |
|                     | KWA ADD:       | 12 MGD      | 1,604 MCF/Day |
| Annual Volume       | Flint:         | 585,561 MCF |               |
|                     | KWA:           | 585,561 MCF |               |
| 2016 Cost of Supply | Flint WTP O&M: | 13.51 /MCF  |               |
|                     | KWA:           | 1.50 /MCF   |               |

## Escalation/Inflation Rate

|       |           |
|-------|-----------|
| Flint | 4.51% /Yr |
| KWA   | 5.0% /Yr  |

## Capital Expenditure

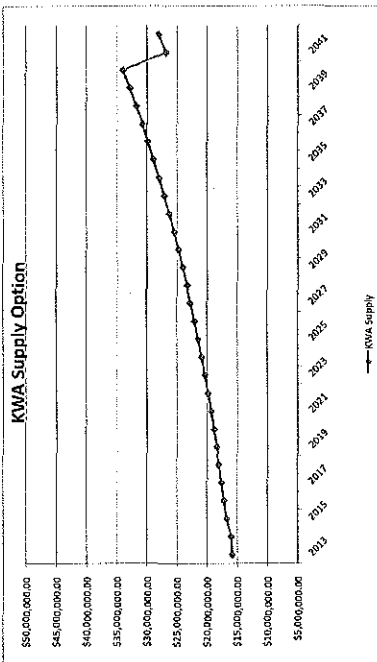
|                                  |                |
|----------------------------------|----------------|
| Capital:                         | \$ 272,421,558 |
| Bond Issuance (2.25% of Total):  | 8,440,000      |
| 3 Years of Capitalized Interest: | 56,000,000     |
| Reserve (10% of Total):          | 37,500,000     |
| Total:                           | \$ 374,361,558 |

|                      |             |
|----------------------|-------------|
| Revenue Bond Rate:   | 5%          |
| Number of Years:     | 25          |
| Annual Cost:         | \$7,968,562 |
| Interest on Reserve: | 3%          |

|                                  |               |
|----------------------------------|---------------|
| Capital:                         | \$ 77,593,362 |
| Bond Issuance (3% of Total):     | 240,000       |
| 3 Years of Capitalized Interest: | 1,600,000     |
| Reserve (10% of Total):          | 1,070,000     |
| Total:                           | \$ 10,668,362 |

|                      |           |
|----------------------|-----------|
| Revenue Bond Rate:   | 5%        |
| Number of Years:     | 25        |
| Annual Cost:         | \$756,946 |
| Interest on Reserve: | 3%        |

## KWA Supply Option



David Guaschela:  
Flint Supply Water from O&M for three years (2013-2015)  
Current rate (2016) 2% increase each year

David Guaschela:  
Highlighted portion is Flint's Entry Fee to KWA

| Year    | Flint WTP O&M | Water Purchases | Pre-Bond Entry Fee & Bond Payment | Flint's Bond Payment | Interest on Reserve | TOTAL         |
|---------|---------------|-----------------|-----------------------------------|----------------------|---------------------|---------------|
| 1 2013  | \$ 2,539,214  | \$ 11,461,700   | \$ 1,152,300                      | \$ 756,946           | \$ 369,600          | \$ 15,793,114 |
| 2 2014  | \$ 3,697,788  | \$ 12,047,785   | \$ 811,400                        | \$ 756,946           | \$ 369,600          | \$ 15,944,373 |
| 3 2015  | \$ 5,654,558  | \$ 12,636,524   | \$ 581,400                        | \$ 756,946           | \$ 369,600          | \$ 16,712,882 |
| 4 2016  | \$ 7,513,118  | \$ 13,225,263   | \$ 351,400                        | \$ 756,946           | \$ 369,600          | \$ 17,447,896 |
| 5 2017  | \$ 9,371,678  | \$ 13,814,002   | \$ 121,400                        | \$ 756,946           | \$ 369,600          | \$ 17,548,721 |
| 6 2018  | \$ 11,230,238 | \$ 14,402,741   | \$ 1,071,401                      | \$ 756,946           | \$ 369,600          | \$ 17,967,838 |
| 7 2019  | \$ 13,088,798 | \$ 15,000,000   | \$ 1,081,401                      | \$ 756,946           | \$ 369,600          | \$ 18,406,084 |
| 8 2020  | \$ 14,947,358 | \$ 15,597,259   | \$ 1,091,401                      | \$ 756,946           | \$ 369,600          | \$ 18,864,322 |
| 9 2021  | \$ 16,805,918 | \$ 16,194,518   | \$ 1,101,401                      | \$ 756,946           | \$ 369,600          | \$ 19,343,497 |
| 10 2022 | \$ 18,664,478 | \$ 16,791,777   | \$ 1,111,401                      | \$ 756,946           | \$ 369,600          | \$ 19,844,538 |
| 11 2023 | \$ 20,523,038 | \$ 17,389,036   | \$ 1,121,401                      | \$ 756,946           | \$ 369,600          | \$ 20,368,441 |
| 12 2024 | \$ 22,381,598 | \$ 17,986,295   | \$ 1,131,401                      | \$ 756,946           | \$ 369,600          | \$ 20,916,266 |
| 13 2025 | \$ 24,240,158 | \$ 18,583,554   | \$ 1,141,401                      | \$ 756,946           | \$ 369,600          | \$ 21,489,101 |
| 14 2026 | \$ 26,098,718 | \$ 19,180,813   | \$ 1,151,401                      | \$ 756,946           | \$ 369,600          | \$ 22,086,089 |
| 15 2027 | \$ 27,957,278 | \$ 19,778,072   | \$ 1,161,401                      | \$ 756,946           | \$ 369,600          | \$ 22,714,425 |
| 16 2028 | \$ 29,815,838 | \$ 20,375,331   | \$ 1,171,401                      | \$ 756,946           | \$ 369,600          | \$ 23,369,359 |
| 17 2029 | \$ 31,674,398 | \$ 20,972,590   | \$ 1,181,401                      | \$ 756,946           | \$ 369,600          | \$ 24,054,200 |
| 18 2030 | \$ 33,532,958 | \$ 21,569,849   | \$ 1,191,401                      | \$ 756,946           | \$ 369,600          | \$ 24,770,313 |
| 19 2031 | \$ 35,391,518 | \$ 22,167,108   | \$ 1,201,401                      | \$ 756,946           | \$ 369,600          | \$ 25,519,130 |
| 20 2032 | \$ 37,250,078 | \$ 22,764,367   | \$ 1,211,401                      | \$ 756,946           | \$ 369,600          | \$ 26,300,144 |
| 21 2033 | \$ 39,108,638 | \$ 23,361,626   | \$ 1,221,401                      | \$ 756,946           | \$ 369,600          | \$ 27,123,919 |
| 22 2034 | \$ 40,967,198 | \$ 23,958,885   | \$ 1,231,401                      | \$ 756,946           | \$ 369,600          | \$ 27,997,082 |
| 23 2035 | \$ 42,825,758 | \$ 24,556,144   | \$ 1,241,401                      | \$ 756,946           | \$ 369,600          | \$ 28,919,371 |
| 24 2036 | \$ 44,684,318 | \$ 25,153,403   | \$ 1,251,401                      | \$ 756,946           | \$ 369,600          | \$ 29,890,546 |
| 25 2037 | \$ 46,542,878 | \$ 25,750,662   | \$ 1,261,401                      | \$ 756,946           | \$ 369,600          | \$ 30,911,148 |
| 26 2038 | \$ 48,401,438 | \$ 26,347,921   | \$ 1,271,401                      | \$ 756,946           | \$ 369,600          | \$ 31,981,577 |
| 27 2039 | \$ 50,260,000 | \$ 26,945,180   | \$ 1,281,401                      | \$ 756,946           | \$ 369,600          | \$ 33,102,422 |
| 28 2040 | \$ 52,118,560 | \$ 27,542,439   | \$ 1,291,401                      | \$ 756,946           | \$ 369,600          | \$ 34,273,275 |
| 29 2041 | \$ 53,977,120 | \$ 28,139,698   | \$ 1,301,401                      | \$ 756,946           | \$ 369,600          | \$ 35,494,733 |
| 30 2042 | \$ 55,835,680 | \$ 28,736,957   | \$ 1,311,401                      | \$ 756,946           | \$ 369,600          | \$ 36,766,791 |

25 Yrs Cumulative  
\$ 553,731,353

30 Yrs Cumulative  
\$ 707,279,715



### City of Flint Water Supply Assessment (TYJT; for Treasury)

DEQ-Drinking Water engineers are responsible for this review. WRD offers one comment however. The KWA pump stations are not supplied with a secondary power source. It would appear that we should ask if this meets "10 States" for drinking water facilities. If power is lost to the pump stations, the Flint WTP would have to be used to supply finished water (with Flint River as the raw source, apparently). It would seem that independent secondary power sources should be provided to the KWA pumping stations to more reliably ensure Lake Huron as the source water.

### Potential Financial Impacts on the DWSD (Sewerage Fund):

It is difficult to quantify the potential financial impact of lost drinking water customers in Flint on the Sewerage Fund. Flint is supplied currently with DWSD drinking water but provides their own wastewater treatment. However, the following is offered:

- Some common functions in DWSD serve both Water and Sewerage. These include HR, purchasing, IT, legal, and top administration (including the Water Board). Further, under the proposed EMA organizational approach it appears that some services units would serve both water and sewer. It would follow that lost revenue to the Water Fund would have some incremental effect on the Sewerage Fund to make up for fixed costs.
- Lost revenue to the Water Fund would not translate to less outstanding water system debt. Would an increased level of water debt service to revenue result in a lower credit rating of an independent DWSD? The rating applies to DWSD as a whole. A lower rating would potentially increase costs to borrow on the sewerage side; for such items as CSO correction and WWTP improvements.
- Some have suggested that financial impact on residents consider both water rates and sewerage rates, combined. Although this is not what WRD currently does, should this type of assessment be presented in the future then lost revenue on the water side will increase costs to those remaining in DWSD (to cover the fixed costs). This could potentially increase the residential financial costs as a % of MHI for City residents, and thus further lengthen the time needed to completed non-core CSO corrections as described in the new permit.

### Effects on NPDES Dischargers:

- 1) Which NPDES permits would be affected?  
Flint WWTP, Flushing WWTP, and Genesee Co-Ragnone WWTP are in the Flint River model/WLA, so all of these and no others are potentially affected (at least in this immediately d/s WLA).
- 2) Would we expect permit limits would be modified as a result of this proposal (and decreased background flows)?  
Since it appears the withdrawal would be near the head of or upstream of the modeled reaches, it would be assumed that all three facilities' limits would become more restrictive, depending on how we approach any load reductions to meet the DO std.
- 3) What would be the percent reduction in flow coming out of Holloway Reservoir?

A 1988 WRC 'ruling' requires that Holloway Reservoir release 85 cfs minimum in the summer, fall, and winter seasons. 232.4 cfs was used in spring modeling. 10 MGD = 15.5 cfs, so

15.5 cfs / 85 cfs = 18.2% reduction  
69.5 cfs would remain

The withdrawal is below Holloway Reservoir, so the flow out of the reservoir itself wouldn't have to change, but the flow at the first WLA facility (Flint WWTP) is reduced. Maybe the Holloway release flow could be increased 10 MGD. Erik believes that the 85 cfs minimum was to protect the fishery.



**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, September 05, 2014 4:25 PM  
**To:** McClellan, Michael (DEQ)  
**Subject:** FW: Flint Site 5 Boil water advisory documents  
**Attachments:** Boil PN TC detected.pdf; Flint-Site5-BWA.pdf

FYI.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Friday, September 05, 2014 2:52 PM  
**To:** Sygo, Jim (DEQ); Wurfel, Brad (DEQ)  
**Cc:** Shaler, Karen (DEQ); Feuerstein, Heather (DEQ); Willard, Veronica (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)  
**Subject:** FW: Flint Site 5 Boil water advisory documents

FYI – heads up.

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, September 05, 2014 2:47 PM  
**To:** Daugherty Johnson ([djohnson@cityofflint.com](mailto:djohnson@cityofflint.com)); Brent Wright ([bwright@cityofflint.com](mailto:bwright@cityofflint.com)); [mglasgow@cityofflint.com](mailto:mglasgow@cityofflint.com)  
**Cc:** Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Prysby, Mike (DEQ); Rosenthal, Adam (DEQ)  
**Subject:** Flint Site 5 Boil water advisory documents

Gentlemen,

Attached are the boil water advisory public notice with all required language and a map of the impacted zone. Please distribute to your media contacts immediately.

Once we have 2 sets of non-detect samples from the impacted area we can discuss lifting the advisory.

You indicated that flushing of the area has already started.

Please ensure the water system is taking investigative steps to identify a possible source

- Inspect storage facilities
- Verify pumping and treatment system remains intact and uncontaminated
- Inspect cross connection accounts in the affected area
- Survey the area for any unidentified cross connections
- Review any recent construction or maintenance in the area
- Check for building permits and with building inspectors for any recent construction in the area
- Check with fire departments and DPW for any temporary or improper hydrant use

- Review pumpage and check for breaks, leaks, or an uptick in unaccounted water loss
- Ensure any vacant properties have had the water service shutoff
- Review CI residual data, conduct additional CI monitoring, and increase disinfectant residual

I will be in contact with the County Health Department and the MDARD Food and Dairy Division.

You can reach me over the weekend at this number or Mike Prysby at his number.

Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

## LOCALIZED DRINKING WATER WARNING

***Coliform bacteria detected in localized area of Flint water system***

### **BOIL YOUR WATER BEFORE USING**

Our water system detected the presence of coliform bacteria in the water supply on September 3, 2014. We routinely monitor for the presence of drinking water contaminants. We took routine samples for coliform bacteria during on September 2, 2014 from all sampling locations throughout the city. The location near Flushing Road and Chevrolet Avenue showed the presence of coliform bacteria. We took three repeat samples at this location and at adjacent locations on September 3 and again on September 4, 2014. Two of the three samples on the 3<sup>rd</sup> showed the presence of total coliform bacteria and three of the three samples collected on the 4<sup>th</sup> in this same area showed the presence of total coliform bacteria. All other monitoring locations in the City continue to show no presence of Coliform bacteria.

#### **What should I do?**

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and preparing food. Boiling kills bacteria and other organisms in the water. **Continue using boiled or bottled water until further notice.** This boil notice is limited to the area bordered by Dayton Street (north), DuPont Street (east), Flint River (south), and LaVelle Road to Flint River (west).

If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from your health care providers about drinking this water.

#### **What does this mean?**

Total coliform bacteria are generally not harmful themselves. *Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present.*

Usually, coliforms are a sign that there could be a problem with the treatment or distribution system (pipes). Whenever we detect coliform bacteria in any sample, we do follow-up testing to see if other bacteria of greater concern, such as fecal coliform or E. coli, are present. We did not find any of these bacteria in our subsequent testing. If we had, we would have notified you immediately. However, we are still finding coliforms in the drinking water.

#### **What happened? What is being done?**

We are still detecting coliform bacteria. We will inform you when our sampling shows that no bacteria are detected. We are flushing the system and increasing the chlorine residual within the affected area. We anticipate resolving the problem within the next two to three days. In the meantime, please continue using boiled or bottled water until we notify you otherwise.

If you have questions, you may contact Mr. Brent Wright of the City of Flint at 810-787-6537, [bwright@cityofflint.com](mailto:bwright@cityofflint.com), 4500 North Dort Highway, Flint MI. 48505 or Daughtry Johnson, Utilities Administrator (810) 766-7135, ext. 2602. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at 1-800-426-4791.

#### **CERTIFICATION:**

WSSN: [enter Water Supply Serial Number]

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

Signature

Title

Date Distributed

Reminder to water supplier: This notice / certification must be sent to the DEQ.

cc: [cc the local health department and the Michigan Department of Agriculture and Rural Development if the boil affects a municipal supply.]

*Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.*

This notice is being sent to you as a precautionary measure by the City of Flint.

**CERTIFICATION:**

WSSN: [enter Water Supply Serial Number]

I certify that this water supply has fully complied with the public notification requirements in the Michigan Safe Drinking Water Act, 1976 PA 399, as amended, and the administrative rules.

\_\_\_\_\_  
Signature\_\_\_\_\_  
Title\_\_\_\_\_  
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cc: [cc the local health department and the Michigan Department of Agriculture and Rural Development if the boil affects a municipal supply.]



**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, October 16, 2014 9:41 AM  
**To:** Brent Wright (bwright@cityofflint.com)  
**Subject:** FW: Flint Water Complaint

Brent,

Here is some additional contact information regarding the complainant.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Crooks, Jennifer [<mailto:crooks.jennifer@epa.gov>]  
**Sent:** Thursday, October 16, 2014 9:39 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** RE: Flint Water Complaint

Steve—thank you for following up on this. Perhaps the following information will help the Water Service Center contact this citizen. The complete information for the citizen is:

Tokoya Cureton  
 810.394.2785  
[Tcicu99@live.com](mailto:Tcicu99@live.com)  
 324 West Jackson Ave  
 Flint 48505

**From:** Busch, Stephen (DEQ) [<mailto:BUSCHS@michigan.gov>]  
**Sent:** Thursday, October 16, 2014 8:12 AM  
**To:** Crooks, Jennifer  
**Subject:** FW: Flint Water Complaint

Jennifer,

As indicated below the City is in the process of following up on this complaint.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Brent Wright [<mailto:bwright@cityofflint.com>]  
**Sent:** Wednesday, October 15, 2014 3:01 PM  
**To:** Busch, Stephen (DEQ)  
**Cc:** [rbincsik@cityofflint.com](mailto:rbincsik@cityofflint.com); Prysby, Mike (DEQ)  
**Subject:** Re: Flint Water Complaint

Steve,

I had Mike Glasgow check on this and we have no record of any complaints at this address. We are going to make an attempt to visit this citizen, but with no phone number and name it makes it difficult to schedule a visit. At least we will flush and test hydrants in the area.

Thank you

On Tue, Oct 14, 2014 at 1:54 PM, Busch, Stephen (DEQ) <[BUSCHS@michigan.gov](mailto:BUSCHS@michigan.gov)> wrote:

Rob,

We have been forwarded the following complaint information from EPA. Could you please let us know whether you have received their complaint and provide a summary of any action or communication with the complainant? Thanks.

Citizen lives at 324 West Jackson Avenue, Flint, 48505

She states, "Water quality is bad since switching to Flint River. My water stinks like sewage at times. I have developed a cough and rash, brown sediment in sink basins and kitchen sink stays backed up. I have written City Hall Water Dept and Council President for help, but no response. "

Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

--

**Brent Wright**

**Water Plant Supervisor**  
**City of Flint**  
**4500 N. Dort Hwy.**  
**Flint, MI. 48505**  
**Ph: 810.787.6537 ext. 3510**  
**Fx: 810.787.3710**



**Rennaker, Joanne (DEQ)**

---

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**Sent:** Thursday, October 16, 2014 9:12 AM  
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 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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Stephen Busch, P.E.

Lansing and Jackson District Supervisor

Office of Drinking Water and Municipal Assistance

MDEQ

517-643-2314

--

**Brent Wright**  
**Water Plant Supervisor**  
**City of Flint**  
**4500 N. Dort Hwy.**  
**Flint, MI. 48505**  
**Ph: 810.787.6537 ext. 3510**  
**Fx: 810.787.3710**

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, January 16, 2015 8:22 AM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Subject:** FW: Flint Water Forum

Brad,

It looks like Flint is planning to meet internally today (Friday) and then convey details back out rather than host the conference call. The meeting is tentatively next Wednesday at 7:00 PM, I believe at City Hall chambers. I expect all local TV stations will be there along with mlive and other news paper reporters.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Howard Croft [<mailto:hcroft@cityofflint.com>]  
**Sent:** Thursday, January 15, 2015 4:35 PM  
**To:** Green, Warren  
**Cc:** Jason Lorenz; Prysby, Mike (DEQ); Busch, Stephen (DEQ); [djansen@gcdcwws.com](mailto:djansen@gcdcwws.com); John O'Brien  
**Subject:** Re: Water Forum

All,

We will confirm the time and details on next Wednesday's meeting internally tomorrow morning and I will relay information to everyone.

Thank you,

On Wed, Jan 14, 2015 at 5:04 PM, Howard Croft <[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)> wrote:  
 All,

In looking ahead to next weeks forum on water I am planning to host a conference call this Friday morning with the participants to get everyone on the same page and discuss details of how the forum should be structured. We have participation commitments from LAN engineering, Genesee County Drain Commissioners office, and MDEQ but we are leaving the door open for others.

The meeting is scheduled for Wednesday January 21st and we are contemplating what time it should be held. Currently we think 7:00 pm is the best time slot.

Please forward me your best availability for Friday morning, and I will establish the call. We would like to begin informing the public of the time, place, and participants of the forum on Friday afternoon.

Thank you,

**Howard Croft**

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7346 Ext.2043

[heroft@cityofflint.com](mailto:heroft@cityofflint.com)

--

**Howard Croft**

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7346 Ext.2043

[heroft@cityofflint.com](mailto:heroft@cityofflint.com)

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, July 16, 2015 11:40 AM  
**To:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Flint Water Question from a Pregnant Flint Resident

FYI. Note the second paragraph in the response from Rita regarding sampling technique.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Crooks, Jennifer [mailto:crooks.jennifer@epa.gov]  
**Sent:** Thursday, July 16, 2015 8:50 AM  
**To:** Busch, Stephen (DEQ); Prysby, Mike (DEQ); Cook, Pat (DEQ)  
**Cc:** Philip, Kris (DEQ)  
**Subject:** FW: Flint Water Question from a Pregnant Flint Resident

FYI—our response to a citizen complaint from Flint.  
 Jennifer

**From:** Mona Munroe-Younis [mailto:mona.m.younis@gmail.com]  
**Sent:** Thursday, July 16, 2015 7:45 AM  
**To:** Bair, Rita  
**Cc:** Crooks, Jennifer; Deltoral, Miguel; Harris, Kimberly; Porter, Andrea  
**Subject:** RE: Flint Water Question from a Pregnant Flint Resident

Hi Rita,

Thank you very much for your detailed response. It is helpful and I appreciate it greatly.

All the best,  
 Mona

On Jul 14, 2015 5:22 PM, "Bair, Rita" <bair.rita@epa.gov> wrote:

We are responding to your email of July 11, 2015 to Miguel Del Toral. He is out of the office today, but has provided the following information to your lead questions. Overall, he agrees with Marc's responses on the water filter. Filters that are certified to remove lead are typically designed to remove 99 percent of the lead. They are also designed with additional capacity as a safety measure, but you should still change the filter in accordance with the manufacturer's instructions. If you identify elevated lead levels from other taps that do not have water filters, we suggest either adding a filter to those, such as the bathroom tap, or only using the filtered tap water for consumption.

If you are still interested in having your water tested you should use a laboratory that has been certified by the State for drinking water analyses (a list is available from the following link: [http://www.michigan.gov/deq/0,4561,7-135-3307\\_4131\\_4156-36940--,00.html](http://www.michigan.gov/deq/0,4561,7-135-3307_4131_4156-36940--,00.html)). Please note that a first-draw sample, regardless of pre-flushing, is best for identifying lead that comes from the faucet and other in-home piping or fittings close to the faucet. First-draw sampling does not give a good indication of the lead contribution from sources further from the faucet (i.e. lead service line, leaded brass meter, etc.). Information for residents about first-draw sampling instructions can be found on the last page of the 2006 memo on aerators and LCR sampling at the following link: [http://www.epa.gov/ogwdw/lcrmr/pdfs/memo\\_tapsamples-aerators\\_10202006.pdf](http://www.epa.gov/ogwdw/lcrmr/pdfs/memo_tapsamples-aerators_10202006.pdf). In addition, below are two graphics from our Region 5 website with information about how to identify if you have a lead service line coming into your home and for faucets that do not have filters on them, how to clean the aerators.

Regarding your TTHM question, EPA has considered developmental and reproductive risks from multiple intake routes of exposure (e.g., ingestion, inhalation, and dermal) in our 2006 Disinfectants and Disinfection Byproducts (DBPR) rule. Some studies did suggest associations between TTHM exposure and various adverse reproductive and development health effects. However, studies available overall showed inconsistent results. As such, our Agency could not conclude whether exposure to TTHMs could cause adverse reproductive/developmental health effects. However, we did note in our findings that there was the potential for concern.

Currently, we are in the process of re-evaluating our DBPR rules and considering new toxicological data regarding reproductive and developmental health effects. Until our evaluation is complete, pregnant women can elect to take additional precautionary measures such as taking shorter showers, venting the room while showering/bathing, and not ingesting water with high TTHM concentrations.

We hope this information is helpful to you.

Rita D. Bair

Section 2 Chief

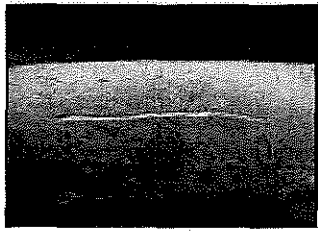
Ground Water and Drinking Water Branch

USEPA-Region 5

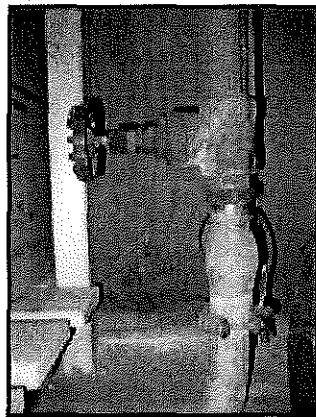
phone: [\(312\) 886-2406](tel:3128862406)

fax: [312-692-2132](tel:3126922132)

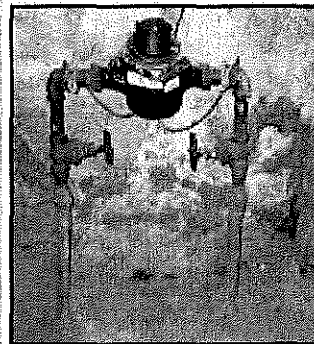
## What do lead service lines look like?



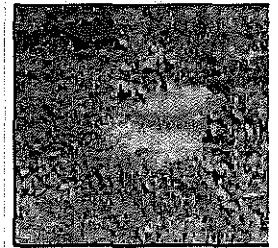
Lead service lines are generally a dull gray color and are very soft. You can identify them easily by carefully scratching with a key. If the pipe is made of lead, the area you've scratched will turn a bright silver color. Do not use a knife or other sharp instrument and take care not to puncture a hole in the pipe.



Lead service lines can be connected to the residential plumbing using solder and have a characteristic solder "bulb" at the end, a compression fitting, or other connector made of galvanized iron or brass/bronze.



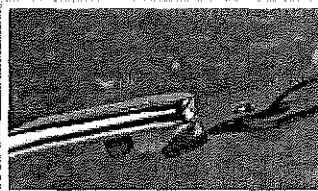
Lead service lines often end just inside the front or side wall of the home, but may extend further into the building as shown, where the lead service line comes out of the basement floor to the water meter and then back into the floor, continuing further into the building.



If your home has a water meter, your water meter may be in your home or "meter pit" or "meter vault" as shown above.

## Cleaning aerators

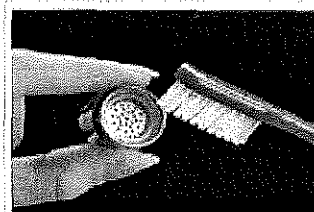
Many taps have an aerator as part of the faucet assembly. Aerator screens are not intended to remove contaminants in water, but may trap sediment or debris as water passes through the faucet. Lead-bearing sediment may end up in drinking water from physical corrosion of leaded solder and can build up in the aerator over time.



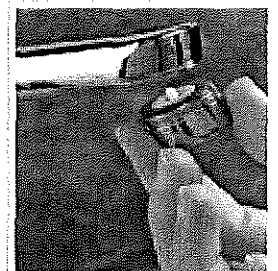
1. Remove the aerator by twisting off with hands or pliers.



2. One or more parts are contained within the aerator. Note the order and orientation of the parts as you remove them.



3. Rinse the pieces with water and brush off the debris. For deposits that are difficult to remove, soak the parts in water for a few minutes and scrub with a toothbrush. Backwashing aerator components is also an effective cleaning method for many aerator types. Hold the removed aerator upside down under flowing water to backwash screens and mesh filters.



4. Reassemble the aerator and screw it back onto the faucet and hand-tighten. If any parts are cracked or broken, replace them. If the washer has hardened, it should be replaced.

**From:** Mona Munroe-Younis [mailto:[mona.m.younis@gmail.com](mailto:mona.m.younis@gmail.com)]  
**Sent:** Saturday, July 11, 2015 5:57 PM  
**To:** [deltoral.miguel@epa.gov](mailto:deltoral.miguel@epa.gov); [edwardsm@vt.edu](mailto:edwardsm@vt.edu)  
**Subject:** Flint Water Question from a Pregnant Flint Resident

Dear Dr. Edwards and Dr. Del Toral,

Thank you for the work you have already done in my city to protect families from water contaminant exposure. I am a Flint resident, pregnant with my first child, and therefore advised to drink a whopping 10-16 cups of water each day. I am writing to see if you can shed some light or point me to another source for answers regarding water testing and the safest option for staying hydrated.

If your wife or sister or friend were living in Flint and pregnant, what course of action would you recommend she take? Here is my situation:

- A little background: Prior to becoming pregnant, I installed a pur advanced water filter on our kitchen faucet and always use it when drinking from the tap, which I do frequently. (According to the pur website, the filter is said to filter out 70+ chemicals. Recently, I contacted the company to request more information on exactly what chemicals are filtered and up to what level, and am awaiting their reply.) When using the filter, the water is crystal clear, free of the river smell and without the slight yellow tinge that we sometimes have coming out of the tap (unlike in our bathroom sink which I use to brush my teeth...). I was compelled to purchase the filter because my legs began to swell after Flint changed to the river water, and after installing the filter this problem went away. I even tested the difference by drinking filtered water some days (consistently no swelling) and and unfiltered water others (consistent swelling) for a week or two. I understand the swelling to be the result of sodium chloride in our water which is corrosive enough to make GM stop using Flint water in their local plant ([http://www.mlive.com/news/flint/index.ssf/2014/10/general\\_motors\\_wont\\_use\\_flint.html](http://www.mlive.com/news/flint/index.ssf/2014/10/general_motors_wont_use_flint.html))
- Given your findings of high levels of lead in some residents' water, my husband strongly believes that I should cease drinking all Flint water and drink bottled water instead. However, I have read extensively about safety concerns of plastic-bottled water (chemists who work with plastics avoid drinking it) and this does not seem to be a safer option despite frequent bottled water drives organized by well-meaning activists across Flint.
- I would like to test our house's tap water with and without the kitchen filter using an independent lab, but my husband thinks this will be a futile effort because we have no reliable way of knowing if the results on one day will be consistent with results on other days, such as if the City of Flint were doing some special change to the water treatment procedure. Would testing multiple times across several weeks be sufficient to address this possibility? If so, how many times and at what interval would you



recommend testing, and can you recommend a testing lab? If a high level of lead is discovered, who should we contact to determine where the lead is coming from as a next step?

- According to the consultant that Erin Brockovich sent to Flint earlier this year ([http://www.mlive.com/news/flint/index.ssf/2015/02/tthm\\_how\\_worried\\_should\\_flint.html](http://www.mlive.com/news/flint/index.ssf/2015/02/tthm_how_worried_should_flint.html)), total trihalomethanes (TTHM) in the water are dangerous to pregnant women through inhalation exposure during hot showers. (And pregnant women tend to appreciate long, hot showers because our backs are constantly aching!) At this point, the lead issues seem more frightening, though we are considering investing in a costly whole-house water filtration system to deal with both. How can we determine the relative risk to pregnant women for lead in the water vs. TTHMs? I suppose that could differ from house to house. What sort of whole-house filtration would you recommend?
- Are there any other considerations that you think I should keep in mind?

Even for those residents who are privileged to be educated and able to afford water filtration devices, the public water issues we are living with are confounding. The information we receive about our public water supply tends to be fragmented and coming from local public officials who have an interest in downplaying public concerns. In the meantime, it is very difficult to make truly informed decisions about our health.

Thank you in advance for any insights you can share and helping to give my baby a good start in life. I understand if you need to respond as a fellow resident of the world and as experts in general rather than as affiliates of the organizations in which you are employed.

Thank you much,

Mona Munroe-Younis

2721 Indian Bow Trail, Flint, MI 48507

(810) 845-4633

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, August 26, 2015 3:03 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: Flint Water Study-VT

FYI. I don't think Adam is interested in participating. Richard, this may better suit your work schedule.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

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**From:** Rosenthal, Adam (DEQ)  
**Sent:** Wednesday, August 26, 2015 11:44 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** FW: Flint Water Study-VT

---

**From:** Marc Edwards [<mailto:edwardsm@vt.edu>]  
**Sent:** Wednesday, August 26, 2015 11:41 AM  
**To:** Rosenthal, Adam (DEQ)  
**Subject:** RE: Flint Water Study-VT

Adam,

I am teaching a class on graduate engineering ethics at Virginia Tech, and we are using the Flint situation as our case study this semester.

Would you or someone else from DEQ, be willing to be interviewed by my class on some Wednesday between 4-6:45 pm?

Best Regards,  
 Marc

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**From:** Marc Edwards [<mailto:edwardsm@vt.edu>]  
**Sent:** Sunday, August 23, 2015 4:57 PM  
**To:** 'ROSENTHALA@michigan.gov'; 'bwright@cityofflint.com'; 'Ptaszinski, Rachel'  
**Subject:** Flint Water Study-VT

Dear Adam, Mike and Rachel,

Hi there. I am a professor at Virginia Tech who specializes in research on corrosion, opportunistic premise plumbing pathogens, lead in water health effects and engineering ethics.

Over the next few months we will be studying Flint water quality issues, in conjunction with all parties who are interested in this subject.

We will be launching our web page to publicly report results of our work.

We visited Flint last week and collected a lot of samples from the distribution system, and we are also doing a lead in water study with residents, to complement that which was recently conducted by the city under the LCR.

Just giving you a heads up on this, and I hope you can give me a point of contact with each of your agencies.

Dependent on what we find, it might be desirable to touch base, in advance of our releasing certain findings.

We also intend to collaborate with all parties, in an open manner, to the extent that is possible, as our study progresses.

Mike, I think I met you a few years back at a Michigan AWWA event, and Rachel, you were kind enough to send me the coliform/E.Coli data last week. Adam, I am not sure if I have ever met you or not.

My cell phone is 540 320 8740, my office phone is 540 231-7236, and my e-mail is on this message. Feel free to call me at any time, if any of you should have any questions about our plans, or the Flint water quality issues that we will be studying.

Best Regards,  
Marc Edwards

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, August 24, 2015 10:23 AM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: Flint Water Study-VT  
**Importance:** High

FYI.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

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**From:** Rosenthal, Adam (DEQ)  
**Sent:** Monday, August 24, 2015 8:53 AM  
**To:** Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Subject:** FW: Flint Water Study-VT

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**From:** Marc Edwards [<mailto:edwardsm@vt.edu>]  
**Sent:** Sunday, August 23, 2015 4:57 PM  
**To:** Rosenthal, Adam (DEQ); [bwright@cityofflint.com](mailto:bwright@cityofflint.com); 'Ptaszenski, Rachel'  
**Subject:** Flint Water Study-VT

Dear Adam, Mike and Rachel,

Hi there. I am a professor at Virginia Tech who specializes in research on corrosion, opportunistic premise plumbing pathogens, lead in water health effects and engineering ethics.

Over the next few months we will be studying Flint water quality issues, in conjunction with all parties who are interested in this subject.

We will be launching our web page to publicly report results of our work.

We visited Flint last week and collected a lot of samples from the distribution system, and we are also doing a lead in water study with residents, to complement that which was recently conducted by the city under the LCR.

Just giving you a heads up on this, and I hope you can give me a point of contact with each of your agencies. Dependent on what we find, it might be desirable to touch base, in advance of our releasing certain findings. We also intend to collaborate with all parties, in an open manner, to the extent that is possible, as our study progresses.

Mike, I think I met you a few years back at a Michigan AWWA event, and Rachel, you were kind enough to send me the coliform/E.Coli data last week. Adam, I am not sure if I have ever met you or not.

My cell phone is 540 320 8740, my office phone is 540 231-7236, and my e-mail is on this message. Feel free to call me at any time, if any of you should have any questions about our plans, or the Flint water quality issues that we will be studying.

Best Regards,  
Marc Edwards

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, April 04, 2014 12:22 PM  
**To:** cookp@michigan.gov  
**Subject:** FW: Flint WTP - Bray Road Lagoon Proposal - MDEQ comments

Pat,

Wouldn't plastic tubing be allowed under the vacuum conditions? I'm not finding anything that would require the schedule 80 steel pipe, and not sure if my got this comment mixed up. Mike's original comment is listed below.

- **It appears that make-up water and chlorine gas are not combined at the chlorine feeder (panel w. rotometer, vacc. monitor, auto. feed control valve, etc.) for production of liquid chlorine. Instead, this appears to take place at the ejector/check valve assembly on the plant supply line. Please confirm. If gas under vacuum is conveyed to the ejector at the plant supply line, the gas piping must be Schedule 80 seamless steel tubing. Please confirm. This can be included on the chlorination system schematic.**

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Matta, Samir [<mailto:SFMatta@lan-inc.com>]  
**Sent:** Thursday, April 03, 2014 3:57 PM  
**To:** Prysby, Mike (DEQ)  
**Cc:** Busch, Stephen (DEQ)  
**Subject:** Re: Flint WTP - Bray Road Lagoon Proposal - MDEQ comments

Hi Mike,

Does the piping have to be schedule 80 steel as our system is under vacuum and not under pressure as required by ten states standards?

Thanks.

Lockwood, Andrews & Newnam  
 Samir Matta, PE  
 (517) 819-2367

On Apr 3, 2014, at 8:57 AM, "Prysby, Mike (DEQ)" <[PRYSBYM@michigan.gov](mailto:PRYSBYM@michigan.gov)> wrote:

Samir,

Attached are our comments pertaining to submittals received for Phase II – Segments I and II for the Flint WTP. If you have any questions concerning our

comments, I will be available till close of business today to discuss with you. After today, you will need to contact Steve Busch concerning any questions regarding the Flint WTP project. I will return from vacation on Monday April 21<sup>st</sup>.

Michael Prysby, P.E.  
District Engineer  
Office of Drinking Water and Municipal Assistance  
517 290-8817

<Pre-lim Eng Reports - DEQ Comments III April 2, 2014.doc>

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**Rennaker, Joanne (DEQ)**

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**From:** Prysby, Mike (DEQ)  
**Sent:** Wednesday, May 28, 2014 4:12 PM  
**To:** Busch, Stephen (DEQ)  
**Subject:** FW: Flint

Steve,

Some more info for me to follow-up on regarding Flint.

Michael Prysby, P.E.  
 District Engineer  
 Office of Drinking Water and Municipal Assistance  
 517 290-8817

---

**From:** Crooks, Jennifer [mailto:crooks.jennifer@epa.gov]  
**Sent:** Wednesday, May 28, 2014 4:03 PM  
**To:** Prysby, Mike (DEQ)  
**Cc:** Poy, Thomas  
**Subject:** Flint

Thank you again, Mike, for talking to me about the Flint water issue. I really like your idea of encouraging the City to do some customer service with the citizens that are complaining about the water. Flushing their line and/or taking a sample at the citizen's house might go a long way to calming people down.

I was also thinking about you doing a chain of custody sample at the plant. I know you trust Brent the operator; but this could be another response to customer complaints to instill trust in the water department. It wouldn't have to be compliance sampling; a special purpose sample perhaps.

Something else I thought of—Ohio is having issues of blue-green algae/cyanotoxins in some of its surface waters, which are related to taste and odor, and can cause rashes; pretty nasty stuff. Don Moore said that the Flint River does have a lot of algae growing on it. See the email below, with some websites on the issue of cyanotoxins in drinking water

The person at Ohio EPA that has dealt with blue-green algae/cyanotoxins in drinking water is Heather Raymond. She might be a good resource to discuss whether it would be worth sampling and analyzing for cyanotoxins in the Flint finished water.

FYI, Don Moore said he was organizing a protest picket line in his neighborhood at the water treatment plant.

Jennifer

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**From:** Drake, Wendy  
**Sent:** Wednesday, May 28, 2014 2:39 PM  
**To:** Crooks, Jennifer  
**Subject:** HABs info

Hi, Jennifer.



Here are a few HABs websites. Both Ohio and Illinois have taken samples at systems and sources where problems have been reported, and I'm not sure about the other states.

**U.S. EPA cyanobacterial HABs website:** <http://www2.epa.gov/nutrient-policy-data/cyanobacterial-harmful-algal-blooms-cyanohabs>; Lesley D'Anglada from the EPA Office of Water's Office of Science and Technology also sends out HABs news updates that people can sign up for by contacting her (see forwarded e-mail below)

**Ohio EPA's HABs—information for PWSs website:** <http://epa.ohio.gov/ddagw/HAB.aspx>; Ohio EPA has a PWS HAB response strategy (<http://epa.ohio.gov/Portals/28/documents/HABs/PWSHABResponseStrategy.pdf>) in which they list Heather Raymond as the PWS HAB Coordinator—her contact information is [heather.raymond@epa.ohio.gov](mailto:heather.raymond@epa.ohio.gov) and (614) 644-2911. Ohio has experienced the most problems in our region.

**Illinois EPA's HABs and algal toxins website:** <http://epa.state.il.us/water/algal-bloom/index.html>; Illinois just launched this program last summer

**IDEM's blue-green algae website:** <http://www.in.gov/idem/algae/>

**MDH's blue-green algal blooms and microcystin website:**  
<http://www.health.state.mn.us/divs/eh/hazardous/topics/bluegreenalgae.html>

**WDNR's blue-green algae website:** <http://dnr.wi.gov/lakes/bluegreenalgae/?a=1>

Please let me know if you have any questions.

Wendy

Wendy Drake | U.S. EPA, Region 5, Water Division, Ground Water and Drinking Water Branch  
77 West Jackson Boulevard, WG-15J | Chicago, IL 60604 | 312-886-6705 | [drake.wendy@epa.gov](mailto:drake.wendy@epa.gov)

**From:** DAnglada, Lesley  
**Sent:** Tuesday, May 27, 2014 5:48 AM  
**To:** DAnglada, Lesley  
**Subject:** HABs News - May 2014

## News

### EPA's Webinar: Prevention, Control and Mitigation of Cyanobacteria and Cyanotoxins

EPA's Office of Science and Technology conducted a webinar on Wednesday, May 14th, on the Prevention, Control and Mitigation of cyanobacteria and cyanotoxins. The presentations are posted on the Control and Treatment tab at the CyanoHABs web page: <http://www2.epa.gov/nutrient-policy-data/cyanobacterial-harmful-algal-blooms-cyanohabs> and the audio recording is available here: <https://epa.connectsolutions.com/p17lociigbi/>

### House Science Panel OKs Bill to Enhance Research, Control Efforts for Algae Blooms

A House committee approved by voice vote May 21 the *Harmful Algal Bloom and Hypoxia Research and Control Amendments Act* (S. 1254) to authorize a national strategy of research, mitigation and control for algal blooms that kill fish and shellfish by depleting oxygen in marine and freshwater bodies. The bill was approved by the Senate in February. It still must make it through the House Natural Resources Committee before it can go to the full House.  
[http://news.bna.com/DELN/DELNWB/split\\_display.adp?fedfid=47002944&vname=dennotallissues&jd=a0f0u7h9x7&split=0](http://news.bna.com/DELN/DELNWB/split_display.adp?fedfid=47002944&vname=dennotallissues&jd=a0f0u7h9x7&split=0)

### Taking the fight to Lake Erie algal blooms before they reach Western New York

Government officials and environmentalists in Buffalo aim at stopping toxic blue-green algae in Lake Erie before it reaches Western New York. They called for a two-pronged federal approach involving the U.S. Environmental Protection Agency and U.S. Department of Agriculture.

<http://www.buffalonews.com/city-region/environment/taking-the-fight-to-lake-erie-algal-blooms-before-they-reach-western-new-york-20140505>

### **Sea Otter's Scourge**

Microcystin stalks marine mammals off the coast of California and kills dogs and cats further inland.

<http://www.the-scientist.com/?articles.view/articleNo/39864/title/Sea-Otter-s-Scourge/>

### **Climate change brings mostly bad news for Ohio**

Scientists delivered a mostly negative forecast for how climate change will affect Ohioans during the next year or so, and well beyond

<http://phys.org/news/2014-05-climate-bad-news-ohio.html>

### **Blue-green algae in Kansas water**

Warnings and Advisories in place from the previous sampling season.

<http://kansasfirstnews.com/2014/05/22/blue-green-algae-in-kansas-water/>

## ***New Research***

### **Land use patterns, ecoregion, and microcystin relationships in U.S. lakes and reservoirs: A preliminary evaluation (attached)**

John R. Beaver, Erin E. Manis, Keith A. Loftin, Jennifer L. Graham, Amina I. Pollard, and Richard M. Mitchell  
Harmful Algae, Volume 36, June 2014, Pages 57-62, ISSN 1568-9883

<http://www.sciencedirect.com/science/article/pii/S1568988314000444>

### **Survival, growth and toxicity of *Microcystis aeruginosa* PCC 7806 in experimental conditions mimicking some features of the human gastro-intestinal environment**

Mara Stefanelli, Susanna Vichi, Giuseppe Stipa, Enzo Funari, Emanuela Testai, Simona Scardala, Maura Manganelli,  
Chemico-Biological Interactions, Volume 215, 25 May 2014, Pages 54-61, ISSN 0009-2797

<http://www.sciencedirect.com/science/article/pii/S0009279714000830>

### **Rapid quantitative analysis of microcystins in raw surface waters with MALDI MS utilizing easily synthesized internal standards**

Amber F. Roegner, Macarena Pérez Schirmer, Birgit Puschner, Beatriz Brena, Gualberto Gonzalez-Sapienza, Toxicon, Volume 78, February 2014, Pages 94-102, ISSN 0041-0101

<http://www.sciencedirect.com/science/article/pii/S0041010113004637>

### **Cyanotoxin occurrence and potentially toxin producing cyanobacteria in freshwaters of Greece: A multi-disciplinary approach**

Spyros Gkelis, Nikos Zaoutsos, Toxicon, Volume 78, February 2014, Pages 1-9, ISSN 0041-0101

<http://www.sciencedirect.com/science/article/pii/S0041010113004388>

### **Investigating the production and release of cylindrospermopsin and deoxy-cylindrospermopsin by *Cylindrospermopsis raciborskii* over a natural growth cycle**

Timothy W. Davis, Philip T. Orr, Gregory L. Boyer, Michele A. Burford, Harmful Algae, Volume 31, January 2014, Pages 18-25, ISSN 1568-9883

<http://www.sciencedirect.com/science/article/pii/S1568988313001364>

### **Status, causes and controls of cyanobacterial blooms in Lake Erie**

Morgan M. Steffen, B. Shafer Belisle, Sue B. Watson, Gregory L. Boyer, Steven W. Wilhelm, *Journal of Great Lakes Research*, Available online 25 January 2014, ISSN 0380-1330  
<http://www.sciencedirect.com/science/article/pii/S0380133013001913>

**Cylindrospermopsis raciborskii dominates under very low and high nitrogen-to-phosphorus ratios**

Michael F. Chislock, Katherine L. Sharp, Alan E. Wilson, *Water Research*, Volume 49, 1 February 2014, Pages 207-214, ISSN 0043-1354, <http://www.sciencedirect.com/science/article/pii/S0043135413009330>

**Acute, chronic and reproductive toxicity of complex cyanobacterial blooms in *Daphnia magna* and the role of microcystins**

Marie Smutná, Pavel Babica, Sergio Jarque, Klára Hilscherová, Blahoslav Maršálek, Maher Haeba, Ludek Bláha, *Toxicol*, Volume 79, 1 March 2014, Pages 11-18, ISSN 0041-0101  
<http://www.sciencedirect.com/science/article/pii/S0041010113004650>

**A nanosensor based on quantum-dot haptens for rapid, on-site immunoassay of cyanotoxin in environmental water**

Long Feng, Anna Zhu, Hongchen Wang, Hanchang Shi, *Biosensors and Bioelectronics*, Volume 53, 15 March 2014, Pages 1-4, ISSN 0956-5663, <http://www.sciencedirect.com/science/article/pii/S0956566313006362>

**Inductive reasoning and forecasting of population dynamics of *Cylindrospermopsis raciborskii* in three subtropical reservoirs by evolutionary computation**

Friedrich Recknagel, Philip T. Orr, Hongqing Cao, *Harmful Algae*, Volume 31, January 2014, Pages 26-34, ISSN 1568-9883,  
<http://www.sciencedirect.com/science/article/pii/S1568988313001339>

*For more information please visit the Cyanobacterial HABs website at <http://www2.epa.gov/nutrient-policy-data/cyanobacterial-harmful-algal-blooms-cyanohabs>*

*Lesley V. D'Anglada, Dr.PH, MEH  
 U.S. Environmental Protection Agency  
 Office of Science and Technology, Office of Water  
 1200 Pennsylvania Ave., N.W. (MC 4304T)  
 Washington, DC 20460  
 Phone: 202-566-1125  
 Fax: 202-566-1140*

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, August 26, 2015 3:29 PM  
**To:** prysbym@michigan.gov; Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** FW: Follow Up from our Aug. 4th meeting

FYI. In case you get any calls from Ms. Walters.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

---

**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Tuesday, August 25, 2015 1:56 PM  
**To:** lwalters313@gmail.com  
**Cc:** Busch, Stephen (DEQ); Devereaux, Tracy Jo (DEQ)  
**Subject:** Follow Up from our Aug. 4th meeting

Dear Ms. Walters,

I wanted to update you regarding our Department's findings related to questions raised during our meeting at the Governor's office on August 4. I apologize for the delay in getting back to you.

Lead and Copper Monitoring

Regarding Flint lead and copper compliance monitoring for the January – June 2015 period, the City has confirmed that all lead and copper samples collected throughout the City, whether routine sites or customer requests, were sent to the State of Michigan lab for analysis. Individual sample results are provided to the property owner within 30 days of receiving the lab results in accordance with the Michigan Safe Drinking Water Act (Public Act 399, 1976 Administrative Rule 410(5)). Results from the State of Michigan lab are provided directly to our Office.

Staff have confirmed that the lead 90<sup>th</sup> percentile compliance calculation of 11 parts per billion is based on 69 samples that met the appropriate sampling location site criteria, and met the sample collection site and collection protocol requirements of the Safe Drinking Water Act for this monitoring period. A minimum of 60 samples were required for this monitoring period. As indicated during the meeting, the City's sampling for lead complies with the Action Level standard of 15 parts per billion, but based on the population served by the City and these results, the City will need to make a recommendation to the MDEQ on how they will fully optimize their corrosion control treatment. These next steps continue to follow the requirements of the Lead and Copper Rule.

Samples collected at your residence of 212 Browning Avenue were not included this compliance determination as you utilize a whole home filter. As stated in the Michigan Safe Drinking Water Act (Public Act 399, 1976 Administrative Rule 710a, Lead and Copper in tap water; monitoring requirements) "Sampling sites may not include faucets that have point of use or point of entry treatment devices designed to remove inorganic contaminants." Such treatment alters the water chemistry and water quality such that it is no longer representative of public water from the City's distribution

system. Therefore, the City cannot use samples collected at your residence as part of its determination for public water system compliance with the lead or copper action level standard.

#### Sample Summary (samples taken at your residence)

For your information, we are providing the information that we've gathered regarding samples collected at your home. Our records indicate between February and June of this year there were six samples collected by either you or Mr. Mike Glasgow with the City of Flint, and submitted to the State Laboratory for analysis as follows:

February 11, Bathroom tap, collected at 10:20 AM by Mike Glasgow. This sample was analyzed for aesthetic metals (copper, iron, manganese, and zinc) which does not include lead analysis.

February 18, Kitchen tap, collected at 7:15 AM by you. This sample was analyzed for lead (104 parts per billion) and copper (non-detect).

February 25, Kitchen tap, collected at 10:26 AM by Mike Glasgow. This sample was analyzed for metals including lead. All results (including lead) were non-detect except for Barium 0.01 parts per million. The result for Barium was well below its maximum contaminant level of 2 parts per million.

March 3, Kitchen tap, collected at 6:00 AM by you. This sample was analyzed for lead (397 parts per billion) and copper (non-detect).

March 18, Kitchen tap, collected at 11:10 AM by Mike Glasgow. This sample was analyzed for lead (4 parts per billion) and copper (non-detect).

April 2, Pre-point of service, collected at 8:00 AM by you. This sample was analyzed for lead (707 parts per billion) and copper (110 parts per billion).

#### Lead Education/Outreach

As we discussed during the meeting, we support efforts to educate homeowners about the sources of lead in their private residence, provide guidance measures to reduce the potential for lead exposure, and provide information on resources for lead abatement. Along those lines, our Office has been in contact with the Department of Health and Human Services, Environmental Health Division, Healthy Homes Section and had some preliminary discussions about a public education and assistance campaign regarding household lead issues, guidance and abatement.

Lead monitoring by public water systems serves a dual purpose. The first purpose is to ensure the public water supply is adequately treating its water to address corrosion potential and help limit lead exposure. The second purpose is to inform homeowners about lead levels within their individual residence so that they can make educated choices regarding their own exposure risk.

#### pH Results

During the meeting concerns were also expressed regarding pH levels within customer plumbing systems. As you may know, pH has no associated contaminant level as it is simply a numeric scale used to specify the acidity or alkalinity of a solution. The City of Flint conducts daily monitoring of pH values on both its raw and finished (treated) water at the City's water treatment plant as part of its operations. The City is also required to conduct water quality parameter monitoring in the distribution system, which includes pH. Samples are analyzed in accordance with Standard Methods using properly calibrated analytical equipment. Results for pH from these samples are summarized below.

Since late April 2014 – June 2015, the following pH conditions were reported:

Water Treatment Plant – Finished Water plant tap pH range = 7.07 minimum to 9.9 maximum, overall average 7.7, measured daily. We believe the 9.9 is a one- time anomaly from softening treatment.

Distribution System – Water Quality Parameters taken from 25 sample sites located throughout and monitored quarterly

July – Sept. 2014: pH 7.71 average, range 7.56 – 7.86

Oct. – Dec. 2014: pH 7.88 average, range 7.62 – 8.10

Jan. – March 2015: pH 7.81 average, range 7.60 – 7.99

April – June 2015: pH 7.63 Average, range 7.48 – 7.80

In addition, the City's treated water contains alkalinity, which is a measurement of the buffering capacity of water to resist a change in pH. As you can see from the water quality parameter monitoring results above there has been very little change in pH within the City's distribution system. The pH levels described within customer site piping or premise plumbing systems are believed to be the result of onsite treatment and not representative of water quality shown to be occurring in the public water supply system.

### Consumer Confidence Report

Finally, there was confusion during the meeting regarding the City's annual water quality report, the Consumer Confidence Report which we have since been able to clarify.

The City of Flint issued two separate Consumer Confidence Reports (CCR's) in 2015 covering the water quality data from 2014. One report was for the period of January – April 2014 when the City was obtaining water from Detroit (DWSD). And a second report was for the period April – December 2014 when the City was using the Flint River and its own Water Treatment Plant.

The CCR for DWSD water was mailed to customers in June. The Flint River based CCR was mailed to customers in mid-July, delayed due to issues with the printing contractor. We agree that having two separate reports caused confusion. We are working with the City to ensure both reports are posted to the City's website and both are made available when requested by customers. Should the City choose to create separate CCR's during the year that the City of Flint connects to the Karegnondi Water Authority we will work with the City to provide more clarity and try to have all material included in a single mailing.

The DWSD based CCR is the one community members had at the meeting, while the DEQ brought a copy of the Flint River based CCR. As separate and distinct sampling was done under each source, this explains the discrepancy in the values and monitoring periods being reported in the respective CCR's.

We appreciate your interest in these matters and hope this has addressed many of the questions brought up during our meeting. I would like to provide this information to both Dr. Sullivan and Ms. Mayes, but I do not have their contact information. I'm hoping you can share this with them and any others that may be interested.

Sincerely,

Liane J. Shekter Smith, P.E., Chief  
Office of Drinking Water and Municipal Assistance  
Michigan Department of Environmental Quality  
517-284-6543

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, March 19, 2015 3:05 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov; Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: Information Request and Documentation

Response from Jim Henry below.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Henry, James [mailto:jhenry@gchd.us]  
**Sent:** Thursday, March 19, 2015 12:15 PM  
**To:** Busch, Stephen (DEQ)  
**Cc:** Valacak, Mark; Cupal, Suzanne  
**Subject:** RE: Information Request and Documentation

Hello Mr. Busch,

Thanks for your response. I'm looking forward to working with your office moving forward. Based upon my experiences with this investigation, I think it is necessary for my communications to be candid and followed up in writing whenever possible. Our goal is to successfully conduct this investigation in efforts to better protect the public.

I agree there are ambiguities written in the FOIA request. GCHD does not have municipal water system expertise and we are continuously learning about the processes. The FOIA request is specific enough that we should have received a timely response from the City of Flint. Also, it is addressed to the City and I apologize if there were misunderstandings regarding the intended recipient.

There have not been any conclusions regarding the source of illnesses. Our team is gathering information and we suspect there may be several sources. It has been made clear that the Flint municipal water system is in compliance with the Safe Drinking Water Act. It seems reasonable that your office would be involved regardless if a potential health risk from municipal water is related to consumption, inhalation or dermal exposure. Perhaps the legislation should be revisited to better address risks.

As you mentioned, we had communications with your office in October 2014, regarding Legionella, but I also had three telephone conversations with Mr. Michael Prysby, from your office between January 21, 2015 and January 23, 2015. These conversations occurred around the same time that your office participated with the TTHM presentation in Flint. I "explicitly explained" the details of the Legionella concerns and the possible associations with the Flint municipal water system and I specifically requested to meet with your office for further discussions.

Mr. Prysby informed me that the concerns were discussed with you. I was informed there was no reason to meet because the municipal water system is in compliance with the Safe Drinking Water Act. Other than the timeframes written in your email, you are correct, I did not contact your office again until the email, dated March, 10, 2015.

GCHD has been working closely with MDCH and has consulted with CDC on several occasions regarding the epidemiological investigation. Also, we have been working with Legionella and municipal water experts, and recently

with the USEPA. Based upon these discussions we have been informed that it is likely that a small amount of Legionella will survive the water treatment process at the plant and enter into the distribution system.

Our team is in the process of developing plans, which may include sampling locations within the distribution system and comparing environmental and clinical isolates. We recognize potential social, political and economic impacts regarding this investigation and need to be prepared for all outcomes. Hopefully, your office, the regulatory agency, will be available for assistance.

If a representative from your office is available to meet next week, please respond with some dates and times. I think it would be appropriate for the City to attend meetings and I will contact Mr. Croft, Flint DPW Director, after I receive a response from your office.

Thank you

Jim

Jim Henry

Jim Henry RS, MBA

Environmental Health Supervisor

Genesee County Health Department [www.gchd.us](http://www.gchd.us)

630 S. Saginaw St., Suite 4

Flint, MI 48502-1540

Phone (810) 257-3618 Fax (810) 257-3125

E-mail [jhenry@gchd.us](mailto:jhenry@gchd.us)



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For a copy of the Health Department's Notice of Information Practices, contact the Health Department or visit the Health Department's website at <http://www.gchd.us/>

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**From:** Busch, Stephen (DEQ) [<mailto:BUSCHS@michigan.gov>]

**Sent:** Friday, March 13, 2015 3:47 PM

**To:** Henry, James

**Cc:** Prysby, Mike (DEQ); Shekter Smith, Liane (DEQ)

**Subject:** RE: Information Request and Documentation

Mr. Henry,

The January 27, 2015, FOIA request you provided was directed to the City of Flint, not the DEQ. The DEQ has no record of a FOIA request from your office for such information. It is our understanding that the City has responded to your FOIA request, has helped you adequately redefine your request within the City's scope of public record to address such ambiguities as "any additional areas of concern", and provided you with additional information beyond the scope of your request.

The DEQ fully recognizes the public health threat posed to individuals that contract Legionnaires' Disease with the understanding that the disease is not contracted by ingestion of potable water and therefore not regulated under the federal Safe Drinking Water Act. Your email below claims that you have explicitly explained the situation to our



Department. However, since contacting our office early last October to indicate a rise in cases, we have not received any further information regarding your epidemiological investigation into this matter.

Further, conclusions that legionella is coming from the public water system without the presentation of any substantiating evidence from your epidemiologic investigation appears premature and prejudice toward that end.

It is highly unlikely that legionella would be present in treated water coming from the City of Flint water treatment plant given the treatment plant's use of ozone along with complete treatment and chlorine disinfect contact time to comply with federal surface water treatment rules for potable water. Detections of total coliform or heterotrophic bacteria in the City's public water distribution system indicate an environment where bacterial growth may be supported. However, there is no direct correlation that can be made to the presence of legionella. While total organic carbon levels in potable water may serve as a food source for bacteria growth in private plumbing system, water temperatures in the City's distribution system are below legionella growth range, and chlorine residual levels would also limit such growth.

Our office agrees that water main breaks, water leaks, and system repairs are possible vectors for legionella to enter the public water system. These should be investigated as part of your epidemiology. DEQ staff can be made available to assist GCHD and the City regarding such matters, but to date no request by GCHD for any such meeting has been received, let alone declined as alleged in your email.

If GCHD is seeking assistance to complete its epidemiological investigation regarding this matter, such resource requests should be directed to the Michigan Department of Community Health. Our Office agrees that a multi-agency partnership would be beneficial to move forward and develop a unified response. In that respect, if our Office can be of any further assistance you may contact me directly.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

**From:** "Henry, James" <jhenry@gchd.us>  
**Date:** March 10, 2015 at 6:40:17 PM EDT  
**To:** Howard Croft <hcroft@cityofflint.com>, "Mike Prysby (DEQ)" <prysbym@michigan.gov>, Elizabeth Murphy <emurphy@cityofflint.com>, "Natasha Henderson" <nhenderson@cityofflint.com>, Jerry Ambrose <gambrose49@gmail.com>, Dayne Walling <dwalling@cityofflint.com>  
**Cc:** "Valacak, Mark" <MVALACAK@gchd.us>, "Cupal, Suzanne" <scupal@gchd.us>, "Hasan, Shurooq" <shasan@gchd.us>, "Childs, Bonnie" <BCHILDS@gchd.us>, "Hallwood, Dawn" <dhallwood@gchd.us>, "Johnson, M.D., Gary" <GJOHNSON@gchd.us>  
**Subject:** Information Request and Documentation

Hello everyone,

The Genesee County Health Department has made several written and verbal requests for specific information since October, 2014, including a Freedom of Information Act Request on January 27, 2015. The information still has not been received and the city's lack of cooperation continues to prevent my office from performing our responsibilities.

The Genesee County Health Department has the responsibility to conduct illness investigations and consider all potential sources, this is not optional. In 2014, Genesee County experienced a significant increase of confirmed Legionella illnesses relative to previous years. Legionella can be a deadly, waterborne disease that typically affects the respiratory system.

The increase of the illnesses closely corresponds with the timeframe of the switch to Flint River water. The majority of the cases reside or have an association with the city. Also, McLaren Hospital identified and mitigated Legionella in their water system. This is rather glaring information and it needs to be looked into now, prior to the warmer summer months when Legionella is at its peak and we are potentially faced with a crisis.

This situation has been explicitly explained to MDEQ and many of the city's officials. I want to make sure, in writing that there are no misunderstandings regarding this significant and urgent public health issue. The Trihalomethane issues "pale in comparison" to the potential public health risks of Legionella.

I am submitting the attached FOIA request again and requesting that the legal obligations of the request are met. If the information is not available, please let me know. In the past, I have requested to meet with the water plant staff and MDEQ regarding Legionella concerns. I did not receive a response from the water plant staff and MDEQ declined. I think it is in the best interest for all stakeholders that we meet and discuss the issues.

Respectfully,

Jim

Jim Henry

Jim Henry RS, MBA

Environmental Health Supervisor

Genesee County Health Department [www.gchd.us](http://www.gchd.us)

630 S. Saginaw St., Suite 4

Flint, MI 48502-1540

Phone (810) 257-3618 Fax (810) 257-3125

E-mail [jhenry@gchd.us](mailto:jhenry@gchd.us)

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, March 12, 2015 8:48 AM  
**To:** prysbym@michigan.gov  
**Subject:** FW: Information Request and Documentation  
**Attachments:** FOIA Request Flint Water.doc

**Importance:** High

FYI.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Thursday, March 12, 2015 8:41 AM  
**To:** Wurfel, Brad (DEQ); Sygo, Jim (DEQ); Howes, Sarah (DEQ)  
**Cc:** Shaler, Karen (DEQ); Benzie, Richard (DEQ); Devereaux, Tracy Jo (DEQ); Busch, Stephen (DEQ)  
**Subject:** FW: Information Request and Documentation  
**Importance:** High

The district received this late Tuesday.

Steve Busch has indicated that the district has not received a meeting request from Jim Henry or the Genesee County Health Department as indicated in his email below.

The FOIA is specifically directed to the City of Flint not the DEQ.

While the change in source may have created water quality conditions that could provide additional organic nutrient source to support legionella growth, there is no evidence or confirmation of legionella coming directly from the Water Treatment Plant or in the community water supply distribution system at this time.

Seems like the next step is to communicate with DCH and possibly develop a joint strategy/response. Not sure who in Exec wants to take the lead on this. Steve Busch and Mike Prysby will continue to be lead for us on this. They have been in contact with DCH recently but only to learn that little progress has been made in identifying a source or sources for the illnesses.

Begin forwarded message:

**From:** "Henry, James" <jhenry@gchd.us>  
**Date:** March 10, 2015 at 6:40:17 PM EDT  
**To:** Howard Croft <hcroft@cityofflint.com>, "Mike Prysby (DEQ)"

<prysbym@michigan.gov>, Elizabeth Murphy <emurphy@cityofflint.com>, "Natasha Henderson" <nhenderson@cityofflint.com>, Jerry Ambrose <gambrose49@gmail.com>, Dayne Walling <dwalling@cityofflint.com>

Cc: "Valacak, Mark" <MVALACAK@gchd.us>, "Cupal, Suzanne" <scupal@gchd.us>, "Hasan, Shurooq" <shasan@gchd.us>, "Childs, Bonnie" <BCHILDS@gchd.us>, "Hallwood, Dawn" <dhallwood@gchd.us>, "Johnson, M.D., Gary" <GJOHNSON@gchd.us>

**Subject: Information Request and Documentation**

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Respectfully,

Jim

Jim Henry

Jim Henry RS, MBA

Environmental Health Supervisor

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# Genesee County Health Department

Mark Valacak, M.P.H., Health Officer  
Gary K. Johnson, M.D., M.P.H., Medical Director

January 27, 2015

FOIA Coordinator, City of Flint  
1101 S. Saginaw Street, 3<sup>rd</sup> floor  
Flint, MI 48502

## **RE: Flint Water Plant Information Request**

Dear FOIA Coordinator,

Under provisions of the Michigan Freedom of Information Act (MCLA 15.231 et seq; MSA 4.1801 (1) et seq) please provide copies of the following:

Provide specific water testing locations and laboratory results within the City of Flint public water system for Coliform, E-coli, Heterotrophic Bacteria and Trihalomethanes from January 1, 2010 to January 27, 2015. Provide any additional water testing that has been conducted for identifying potential public health risks. Include any available mapping of the water testing areas.

Provide a map delineating the boundaries of the City of Flint water distribution system. Include any changes to the boundaries, along with corresponding dates from January 1, 2014 to January 27, 2015.

Provide a map or list of locations, detailing dead ends, pooling, low pressure and any additional areas of concern within the City of Flint water distribution system. Include any modifications to the water distribution system addressing concerns, along with corresponding dates from January 1, 2014 to January 27, 2015.

If you determine that any of the requested information is exempt from disclosure, please detail what is being withheld and cite the exemption under FOIA. I anticipate the request being filled within five working days of receipt of this letter, as provided under FOIA. Please contact me at (810) 257-3618 if there are fees associated to comply with this request.

Sincerely,

**Jim Henry**

Jim Henry  
Environmental Health Supervisor  
Genesee County Health Department  
630 S. Saginaw Street  
Flint, MI 48502

Better Life Through Better Health

Floyd J. McCree Courts & Human Services Building ♦ 630 S. Saginaw Street, Ste. 4 ♦ Flint, Michigan 48502-1540

Burton Branch ♦ G-3373 S. Saginaw Street ♦ Burton, Michigan 48529

Main Phone 810-257-3612 ♦ Visit us at: [www.gchd.us](http://www.gchd.us)

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 28, 2015 10:20 AM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Subject:** FW: interview for article on Flint drinking water

In case you missed the first email here is Chastity's original request and my response.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, January 26, 2015 1:09 PM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov; Datema, Maggie (DEQ); Tommasulo, Karen (DEQ)  
**Subject:** FW: interview for article on Flint drinking water

FYI. Bridge Magazine request for information. See below. Note Letter to Governor office deferred to Governor's Office at this time.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, January 26, 2015 1:07 PM  
**To:** 'Chastity Pratt'  
**Subject:** RE: interview for article on Flint drinking water

Ms. Pratt Please see responses to your questions below.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Chastity Pratt [<mailto:cpratt@bridgemi.com>]  
**Sent:** Monday, January 26, 2015 11:35 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** Interview for article on Flint drinking water

Hi,  
 I am a reporter for Bridge Magazine working on a deadline story about Flint's drinking water. My story will focus on state involvement and state policy.

My major questions:

1. Several agencies and officials are involved - can you clarify DEQ's role in the Flint water situation?

The City of Flint water system is one of over 1400 Community Water Systems in Michigan regulated under the Michigan Safe Drinking Water Act (1976 Public Act 399, as amended), which incorporates requirements of the federal Safe Drinking Water Act. The DEQ Office of Drinking Water and Municipal Assistance has been given authority for oversight of these regulations. DEQ regulatory oversight is mainly conducted through inspections, review of monitoring information (this includes sample results and operations data), issuance of construction permits for water systems, and planning (reliability, emergency response, capital improvement, operation and maintenance, etc.) As both community water systems and the DEQ desire the mutual goal of safe water, the DEQ works proactively in partnership with water systems to provide compliance assistance. This also includes activities such as source water protection and infrastructure funding.

2. What is the DEQ's response to the mayor's request for assistance?

As indicated by phone this letter was directed to the Governor's Office and should be followed up with that office for response at this point in time.

3. What on-going testing is DEQ doing with Flint water and how often?

The City is required to follow all state and federal monitoring requirements under Act 399. This includes sample analysis of over 90 contaminants with health based drinking water standards along with monitoring of its source, treatment, and distribution operations. Sample analysis frequency is based on the specific contaminant type, its level of detection if any, and its potential variability.

In regards to total coliform and e.coli bacteria compliance monitoring, the City is required to analyze at least 100 samples each monthly compliance period from its distribution system.

In regards to Total Trihalomethane (TTHM) compliance monitoring, the City is required to collect quarterly samples from 8 locations in its distribution system. The TTHM standard is based on a Running Annual Average for each of the 8 locations, rather than individual sample results. The location and timing of these samples is based on worst case conditions in the water system to identify the highest level of long term exposure.

4. So far, how many drinking water violations have occurred in Flint since the switch to Flint River water and what sanctions - if any - does the city face?

The City has had the following Maximum Contaminant Level (MCL) standard violations:

E.Coli Acute bacteria MCL violation, August 2014

Total Coliform bacteria MCL violation, September 2014

TTHM locational running annual average MCL violation, October-December quarter (2 of 8 sites)

There are generally two requirements in regards to the violations: Public Notification and corrective action

Public Notice for acute health threats like the e.coli MCL must be made within 24 hours of the violation.

Public Notice for non-acute health threats such as total coliform bacteria and TTHM must be made within 30 days of the violation.

Corrective action regarding bacteria detections generally involves taking steps to disinfect and repair the affected areas and sampling to obtain confirmation the bacteria source has been addressed.

The City has remained in compliance with this standard for each of the monthly monitoring periods since September, including thus far in January

Corrective action for TTHM involves taking steps to reduce the amount of TTHM so that they are below the standard. The City is required to complete an Operational Evaluation report within 90 days of the violation. This report includes examination of treatment and distribution operational practices (source water quality, treatment changes, storage tank operations, excess storage capacity, distribution system flushing, treatment problems that contribute to TTHM formation. The City proactively completed an Operational Evaluation following sample results from August 2014, and is now completing another operational evaluation further evaluated based on information from the November monitoring. November monitoring showed individual sample results now below the standard at 7 of 8 locations. However, as noted compliance is determined based on a running annual average at each location.

5. What does DEQ tell Flint residents who call DEQ with concerns about discolored water?

Callers indicating discoloration or other aesthetic water quality issues are directed to contact the Flint DPW to allow the DPW staff to investigate the situation. Generally color, odor and taste are aesthetic water quality issues not related to any health based standards including total coliform bacteria, e.coli bacteria, and TTHM.

Treated water is monitored for color at the Water Treatment Plant as part of its operation, and has not been abnormal. The City of Flint has over 500 miles of distribution piping and conditions in some isolated sections of water main piping or private premise plumbing may cause changes to aesthetic conditions such as color, taste, or odor.

Those are my major questions. Could you please give me a call today?

--

Chastity Pratt Dawsey

Reporter

Bridge Magazine/The Center for Michigan

28 W. Adams Suite 330, Detroit, MI 48226

[www.bridgemi.com](http://www.bridgemi.com)

C: 313-310-7867



**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, January 26, 2015 1:09 PM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov); prysbym@michigan.gov; Datema, Maggie (DEQ); Tommasulo, Karen (DEQ)  
**Subject:** FW: interview for article on Flint drinking water

FYI. Bridge Magazine request for information. See below. Note Letter to Governor office deferred to Governor's Office at this time.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, January 26, 2015 1:07 PM  
**To:** 'Chastity Pratt'  
**Subject:** RE: interview for article on Flint drinking water

Ms. Pratt Please see responses to your questions below.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Chastity Pratt [<mailto:cpratt@bridgemi.com>]  
**Sent:** Monday, January 26, 2015 11:35 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** interview for article on Flint drinking water

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Treated water is monitored for color at the Water Treatment Plant as part of its operation, and has not been abnormal. The City of Flint has over 500 miles of distribution piping and conditions in some isolated sections of water main piping or private premise plumbing may cause changes to aesthetic conditions such as color, taste, or odor.

Those are my major questions. Could you please give me a call today?

--

Chastity Pratt Dawsey

Reporter

Bridge Magazine/The Center for Michigan

28 W. Adams Suite 330, Detroit, MI 48226

[www.bridgemi.com](http://www.bridgemi.com)

C: 313-310-7867

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, September 11, 2015 4:55 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: LEG00188 Ananich / Safety and treatment of city of Flint's water  
**Attachments:** EXE 15 LEG00188I Ananich.pdf

Here's your relief.

Stephen Busch, P.E.  
MDEQ Lansing District Coordinator  
Office of Drinking Water and Municipal Assistance  
Lansing and Jackson District Supervisor  
517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

---

**From:** DEQ-LogLetter  
**Sent:** Friday, September 11, 2015 2:08 PM  
**To:** DEQ-Legislative-Contact  
**Cc:** Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ); Shaler, Karen (DEQ); Pallone, Maggie (DEQ); Wurfel, Brad (DEQ); Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Cook, Pat (DEQ)  
**Subject:** LEG00188 Ananich / Safety and treatment of city of Flint's water

Assigned to EXE (Maggie Pallone)

## Letter Buckslip

11-Sep-15

|                 |                                               |                                           |
|-----------------|-----------------------------------------------|-------------------------------------------|
| ID:             | LEG00188                                      | Deputy Director _____                     |
| Date of letter: | 9/10/2015                                     | Deputy's Mgmt. Asst. _____                |
| Date received:  | 9/10/2015                                     | Director's Office Staff _____             |
| Date due:       | 9/21/2015                                     | Division/Office Chief _____               |
| Reply date:     |                                               | Division/Office Chief's Mgmt. Asst. _____ |
| Last name:      | Ananich                                       | Prepared by: _____                        |
| First name:     | Jim                                           | Division/Office _____                     |
| Organization:   | Senator                                       | Exec. Div. File No. _____                 |
| Subject:        | Safety and treatment of city of Flint's water | <input type="checkbox"/> Delogged         |
| Reply to:       |                                               |                                           |
| Author:         |                                               |                                           |
| Owner:          | SHALERK                                       |                                           |

| <u>Action</u> | <u>Action Date</u> | <u>Due Date</u> | <u>Entity</u> | <u>Signature</u> | <u>Owner</u> | <u>CCs</u>                                                                                                                                               |
|---------------|--------------------|-----------------|---------------|------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assigned 1    | 9/11/2015          | 9/21/2015       | EXE           | HAA              | SHALERK      | Thelen<br>Sygo/Shaler<br>Maggie Pallone<br>Brad Wurfel<br>DEQ-Legis-Contact<br>Liane Shekter Smith<br>Steve Busch<br>Pat Cook<br>3-1 MI Sen. & Rep. File |

**Comments:** Original to Maggie Pallone

The letter requests a response by 9/14/15, so Maggie has a call into Eric Brown and Dennis Muchmore about scheduling a briefing instead of sending a response letter from the Director.

LEG00188

**Thelen, Mary Beth (DEQ)**

---

**From:** The Office of Senator Ananich <SenJAnanich@senate.michigan.gov>  
**Sent:** Thursday, September 10, 2015 12:57 PM  
**To:** Wyant, Dan (DEQ); Pallone, Maggie (DEQ)  
**Cc:** Jordan.Dickinson@mail.house.gov; mayor@cityofflint.com; HCroft@cityofflint.com; hedman.susan@epa.gov; poy.thomas@epa.gov; Schock.michael@epa.gov; Lytle.darren@epa.gov; fortin.denise@epa.gov; Shekter Smith, Liane (DEQ); Cook, Pat (DEQ); Busch, Stephen (DEQ); Wurfel, Brad (DEQ); Edwardsm@vt.edu  
**Subject:** Letter Regarding Water in the City of Flint  
**Attachments:** Flint Water Letter to DEQ 09102015.pdf

Director Wyant,

Please see the attached letter regarding water in the City of Flint. For your convenience, we are also mailing a hard copy of this letter to your office.

Thank you for your prompt consideration of this urgent matter impacting our community.

Sincerely,

Jim Ananich  
Senate Democratic Leader  
District 27

Sheldon Neeley  
State Representative  
District 34

Phil Phelps  
State Representative  
District 49



## STATE OF MICHIGAN

September 10, 2015

Michigan Department of Environmental Quality  
Executive Division  
DEQ Director: Dan Wyant  
P.O. Box 30473  
Lansing, MI 48909-7973

Director Wyant,

In light of recently released findings by the American Civil Liberties Union, independent researchers and a troubling Interim U.S. Environmental Protection Agency memo from June, we are requesting additional answers about the safety and treatment of the City of Flint's water.

Several disturbing points have been raised and we have a number of urgent questions, including:

- **When did the MDEQ become aware of the June 24, 2015, Interim EPA memo and whom was it shared with?**
  - Which Flint city officials also received this information?
  - Why was the memo not immediately shared with the public?
  - What response did MDEQ have to the EPA concerns raised in the memo?
  - Were any actions taken by the MDEQ as a result of the issues mentioned in the memo?
  - What steps, if any, were taken to determine the validity of the Virginia Tech study?
- **Please explain why the pre-flushing method of sampling was used in this instance.**
  - Is it the same method that is applied to all sampling or does the agency have the discretion to decide?
  - Who is responsible for making the decision to pre-flush?
  - The EPA memo references the Lead Copper Rule requirement that systems greater than 50,000 users maintain "corrosion control treatment." As the regulator, why did the MDEQ choose not to enforce that standard?
  - The EPA recommends allowing water to rest for at least six hours, but no more than 12 hours, before taking a sample. On MDEQ's Web site, it suggests flushing the line for five minutes before the six-hour rest. How did the department arrive at this method?
- According to a July 9, 2015, article on DeadlineDetroit.com, "Scary: Leaded Water and One Flint Family's Toxic Nightmare,"

*"The EPA offered Flint officials the use of agency experts to help get the situation under control," said Del Toral, but added that, to his knowledge, the city has so far declined all help.*

*LeeAnne Walters said that when she asked why city officials weren't taking the EPA's offer of assistance, she was told, "We don't need it."*



## STATE OF MICHIGAN

*Flint spokesman Lorenz, on the other hand, maintained "the city continues to work closely with the MDEQ and the EPA Regional Office."*

- Who refused the EPA's offer of expert assistance and why?
- Is the damage done to the pipes (as described in the EPA report) accurate?
  - If yes, will damaged pipes continue to leach lead or will properly treated water safely reach consumers?
  - What is the plan and timeline to address it?
- And most importantly, what can be done immediately to ensure safe, affordable drinking water for the citizens of Flint?

Many of the decisions that led to the current situation occurred while a state-appointed manager was in control and MDEQ personnel were consulted about testing methods and how to address the situation. In addition, MDEQ also encouraged the method of water testing used by Flint officials. We believe that there is a heightened obligation by the state to make this right.

Due to the serious public health threats of this situation, we respectfully request a response to these matters by Monday, September 14, 2015.

We will do our best to accommodate meeting requests, if necessary, but would appreciate written responses to the above questions so that we can make informed decisions swiftly to address these serious concerns.

Sincerely,

Jim Ananich  
Senate Democratic Leader  
District 27

Sheldon Neeley  
State Representative  
District 34

Phil Phelps  
State Representative  
District 49

cc:

U.S. Representative Dan Kildee  
Mayor Dayne Walling, City of Flint  
Howard Croft, City of Flint  
Susan Hedman, EPA  
Thomas Poy, EPA  
Michael Schock, EPA-ORD  
Darren Lytle, EPA-ORD  
Denise Fortin, EPA  
Liane Shekter-Smith, MDEQ  
Pat Cook, MDEQ  
Stephen Busch, MDEQ  
Brad Wurfel, MDEQ  
Marc Edwards, Virginia Tech



**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, October 21, 2015 12:54 PM  
**To:** Sygo, Jim (DEQ) (SygoJ@michigan.gov)  
**Subject:** FW: Letter Requesting EPA Review of Flint, MI Water  
**Attachments:** 2015.10.21 EPA Review Request FINAL.PDF

FYI. In case you weren't cc'd.

Stephen Busch, P.E.  
MDEQ Lansing District Coordinator  
Office of Drinking Water and Municipal Assistance  
Lansing and Jackson District Supervisor  
517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

---

**From:** The Office of Senator Ananich [<mailto:SenJAnanich@senate.michigan.gov>]  
**Sent:** Wednesday, October 21, 2015 12:46 PM  
**Subject:** Letter Requesting EPA Review of Flint, MI Water

Administrator McCarthy and Regional Director Hedman,

Please see the attached letter regarding a request for an EPA review of Flint, Michigan's water treatment.

Please do not hesitate to contact my office if you have any questions. Thank you for your time and attention.

Sincerely,

**The Office of State Senator Jim Ananich**  
Michigan Senate Minority Leader  
District 27

SENATE MINORITY LEADER  
**JIM ANANICH**

517.373.0412  
senjananich@senate.michigan.gov  
senatedems.com/ananich

 /jimananich  @jimananich

October 21, 2015

Gina McCarthy  
**Administrator**  
United States Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Mail Code 6106A  
Washington, DC 20460

Susan Hedman  
**Regional Administrator**  
United States Environmental Protection Agency Region 5  
Ralph Metcalfe Federal Building  
77 West Jackson Boulevard  
Chicago, IL 60604

**Re: EPA Review Needed on Flint, Michigan Water Treatment**

Administrator McCarthy and Regional Director Hedman,

Today Congressman Dan Kildee requested that the United States Environmental Protection Agency conduct an investigation into the water system in Flint, Michigan. I agree that such an investigation is vital to ensuring that the people responsible for Flint's dangerous water quality are held accountable. Similar to Congressman Kildee's request, I am requesting the EPA conduct a review of the Michigan Department of Environmental Quality's (MDEQ) oversight of water treatment in Flint as provided for in the Lead and Copper Rule, 40 CFR Sec. 141.80.

After decades of relying on water from the Detroit Water and Sewerage Department (DWSD), Flint began treating its own water from the Flint River in April 2014 at the behest of state-appointed Emergency Managers. DWSD had used — and continues to use — anti-corrosion treatments in its water to prevent lead leaching from an aging infrastructure into residents' drinking water. For a number of reasons, raw water from the Flint River is significantly more corrosive than the lake water that DWSD uses. Despite this, Flint chose not to treat the raw Flint River water by any method traditionally associated with preventing lead corrosion. Multiple consultants and the EPA advised the city to use additional corrosion control measures, but that advice went unheeded by the City of Flint and the MDEQ.

Foreseeably, lead has been seeping into Flint's drinking water for more than a year, causing an alarming rise in the number of children in Flint with elevated blood lead levels. Independent research conducted by Virginia Tech professor Marc Edwards indicated high lead levels in tap water, and a study led by Hurley Medical Center pediatrician Dr. Mona Hanna-Attisha revealed that in high-risk areas of the city, the rate of lead overexposure among children more than doubled since switching water sources. State data have confirmed these results.

Additionally, several questions remain regarding how Flint and state officials conducted water sampling under the Lead and Copper Rule. Allegedly, officials did not target samples in high-risk Tier 1 locations or repeat locations in subsequent tests. Consumers were also instructed to pre-flush their taps prior to collecting samples, resulting in lower lead level results. It is unclear whether a sufficient number of samples were taken or why MDEQ excluded two high lead level samples from Flint's July 2015 water quality report.

SENATE MINORITY LEADER  
**JIM ANANICH**

☎ 517.373.0412  
 ✉ [senjananich@senate.michigan.gov](mailto:senjananich@senate.michigan.gov)  
 🌐 [senatedems.com/vananich](http://senatedems.com/vananich)

📺 /Jlmananich 📺 @Jlmananich

The State of Michigan has pledged to help reconnect the City of Flint to DWSD and take additional steps to help remediate the lead problem. However, these are stopgap measures that will never undo the damage already done.

Ultimately, the EPA retains the ability and responsibility to oversee the state's efforts to obtain and maintain safe drinking water for its residents. As such, I appreciate that the EPA has established the Flint Safe Drinking Water Task Force. However, it also is within the EPA's power to review the actions of MDEQ and the City of Flint as they pertain to lead testing and treatment under the Lead and Copper Rule. We want to ensure Flint remains compliant once it switches its permanent water source to the Karegnondi Water Authority.

I respectfully request that, under 40 CFR Sec. 142.19, Regional Administrator Hedman review MDEQ's determinations regarding corrosion control for lead in Flint, Michigan. Regardless of the findings, I am also requesting that Regional Administrator Hedman make public all evidence gathered during the course of that review. Michigan citizens deserve to know whether MDEQ is operating safely and effectively.

If you have any questions, please contact my office at [senjananich@senate.mi.gov](mailto:senjananich@senate.mi.gov) or (517) 373-0142. Thank you for your consideration.

Sincerely,

  
 Jim Ananich  
 Senate Democratic Leader  
 District 27

cc:

Governor Rick Snyder  
 U.S. Representative Dan Kildee  
 U.S. Senator Debbie Stabenow  
 U.S. Senator Gary Peters  
 State Representative Sheldon Neeley, District 34  
 State Representative Phil Phelps, District 49  
 Mayor Dayne Walling, City of Flint  
 Howard Croft, City of Flint  
 Susan Hedman, EPA  
 Thomas Poy, EPA  
 Michael Schock, EPA-ORD  
 Darren Lytle, EPA-ORD  
 Denise Fortin, EPA  
 Dan Wyant, MDEQ  
 Liane Shekter-Smith, MDEQ  
 Pat Cook, MDEQ  
 Stephen Busch, MDEQ  
 Brad Wurfel, MDEQ  
 Marc Edwards, Virginia Tech

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, September 16, 2015 11:20 AM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Subject:** FW: List of potential FAQ Questions

Brad,

Below is what I got back from Richard and Liane. Between theirs and mine what do you think is more appropriate?

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

---

**From:** Benzie, Richard (DEQ)  
**Sent:** Wednesday, September 16, 2015 11:17 AM  
**To:** Busch, Stephen (DEQ); Shekter Smith, Liane (DEQ)  
**Subject:** Re: List of potential FAQ Questions

Here's our revised list of questions. We feel it addresses your questions or the answers fit under one of these questions

1. Provide the regulatory background/summary
2. Did the DEQ have concerns related to the switch from DWSD to the Flint River with respect to corrosion?
3. Is Flint conducting compliance monitoring correctly under the LCR?
4. What is the city of Flint required to do next to address corrosion control?
5. Where does lead come from and whose responsibility is it to address it?
6. What could be done to better inform and protect Flint residents?
7. What will happen when Flint switches to water from KWA?

These are our suggestions - you're carrying the water for this exercise!

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, September 16, 2015 10:07:10 AM  
**To:** Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)  
**Subject:** List of potential FAQ Questions

Here is a list of potential FAQs. Let me know what you think.

What is the frequency of lead and copper sampling?  
 Why are customers asked to collect lead and copper samples?  
 How is compliance determined?  
 Why are some samples not included in the compliance determination?  
 When is customer and public notification required?  
 What will happen when Flint obtains water from the Karegnondi Water Authority?

What is the source of lead?  
Who is responsible for replacement of leaded materials?  
Why doesn't the City just replace their portion of lead service lines?  
What is the timeline for corrosion control treatment?  
What will it cost to have lead service lines replaced?  
How long will it take to replace lead service lines across Flint?  
How does blood level monitoring tie into customer tap water monitoring?  
How long has the City of Flint conducted lead monitoring?  
Has the City's compliance monitoring ever exceeded the lead action level?  
What is the goal of the Lead and Copper Rule?

Stephen Busch, P.E.  
MDEQ Lansing District Coordinator  
Office of Drinking Water and Municipal Assistance  
Lansing and Jackson District Supervisor  
517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, April 02, 2015 2:06 PM  
**To:** Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** FW: LT2 letter for Flint  
**Attachments:** Cover letter 2nd round Sch 2 plants.docx; Schedule 2 LT2 Sampling Plan Template.docx; Round 2 Sched 2 Calendar.xlsx; Crypto Certified labs April 2015.pdf

FYI.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

---

**From:** Cook, Pat (DEQ)  
**Sent:** Thursday, April 02, 2015 2:04 PM  
**To:** Prysby, Mike (DEQ)  
**Cc:** Busch, Stephen (DEQ)  
**Subject:** LT2 letter for Flint

Hi Mike,

Attached is the information that you will have to mail to the Flint WTP ASAP pertaining to the 2<sup>nd</sup> round of source water monitoring as required by the LT2 Rule. The first attachment is a letter that you will have to place on Lansing District letterhead with an appropriate signature block. The next 3 attachments are documents that you will need to print out and include with the letter.

You should also consider emailing the sampling plan template, calendar and example schematics to them so they can complete those forms electronically if they choose to do so. I'll email you the example schematics in a separate email.

If you have any questions, please give me a call.

Patrick Cook, P.E.  
Community Drinking Water Unit  
Office of Drinking Water & Municipal Assistance  
Michigan Department of Environmental Quality  
Phone: (517) 284-6514  
[cookp@michigan.gov](mailto:cookp@michigan.gov)

Date:

To: Schedule 2 Plants

Address:

Dear :

SUBJECT: Long Term 2 Enhanced Surface Water Treatment Rule  
2<sup>nd</sup> Round of Source Water Monitoring Requirements

The Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule) was promulgated by the U.S. Environmental Protection Agency on January 5, 2006. The Michigan Department of Environmental Quality adopted this rule into the Michigan Administrative Rules in December, 2009. All public water systems that are supplied by a surface water source and systems supplied by a ground water source under the direct influence of surface water (GWUDI) are subject to this rule.

According to the LT2 Rule, systems are required to conduct an initial and a second round of source water monitoring for each plant that treats a surface water or GWUDI source. Please keep in mind that Grandfathering data will not be accepted for the second round of monitoring. This monitoring includes at least one source water *Cryptosporidium*, *E. coli*, and turbidity sample per month for a period of 24 months for systems serving populations greater than 10,000 people. Systems will be assigned to a "treatment bin" based on the results of source water monitoring. The treatment bin specifies the level of *Cryptosporidium* removal and/or inactivation that the system must achieve.

Our records indicate that your system is required to comply with the source water monitoring requirements on **Schedule 2** as stated below in Table 1. Therefore, your system is required to submit to the DEQ a source water monitoring plan for each plant by July 1, 2015, and start the 2<sup>nd</sup> round of monitoring in October, 2015.

**Table 1 – LT2 Milestone Dates for 2nd Round of Source Water Sampling**

| System Population | Schedule | Must submit Source Water Sampling Plan by... | Must begin second round of source water monitoring... |
|-------------------|----------|----------------------------------------------|-------------------------------------------------------|
| At least 100,000  | 1        | January 1, 2015                              | April 1, 2015                                         |
| 50,000 – 99,999   | 2        | July 1, 2015                                 | October 1, 2015                                       |
| 10,000 – 49,999   | 3        | July 1, 2016                                 | October 1, 2016                                       |
| <10,000           | 4        | July 1, 2017                                 | October 1, 2017                                       |

Enclosed with this letter is a Source Water Sampling Plan template that you can complete and submit to this office to comply with the July 1, 2015 deadline. The template includes instructions and a worksheet that will assist the DEQ in determining if your plan meets the requirements of the LT2 Rule.

If you have any questions about this subject, please contact this office.



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE**

**LONG TERM 2 (LT2) SOURCE WATER SAMPLING PLAN TEMPLATE  
Round 2 Sampling – Schedule 2 Systems**

A responsible official for the water system should submit the following information for DEQ review and approval.

A sampling plan packet consisting of:

1. The name of the Michigan Accredited Lab that will be performing the *Cryptosporidium* analysis. A list of approved labs can be obtained at <http://www.michigan.gov/deqlaboratoryservices>, click on Certifications, click on Drinking Water Analysis Laboratory, click on Cryptosporidium Laboratories.
2. The name of the Michigan Accredited Lab that will be performing the *E.coli* analysis. The laboratory that you select must be certified for *E.coli* enumeration (counting) using an U.S. EPA Approved Analytical Method.
3. Use the enclosed calendars for 2015 - 2017 to select or highlight the days between October 1, 2015, and September 30, 2017, on which you will be collecting your samples. You may also submit a one-page summary of the dates when samples will be collected in mm/dd/yy format. Samples must be collected within a five day window (the date you select, plus or minus 2 days).
4. A schematic indicating all raw water sources, chemical feed points and recycle locations along with an arrow indicating the exact sample location.
5. Completed Source Water Sampling Location Worksheet (provided on the following pages with instructions). Completed worksheets must be submitted to your DEQ Drinking Water District Engineer at least 3 months prior to the start of your system's required sampling period (7-1-15).
6. Signature of the responsible official for the water system acknowledging that water system staff will notify the DEQ immediately upon discovery of any issues related to timely source water sample collection or accurate lab analysis of samples.



## **LT2 SOURCE WATER SAMPLING LOCATION WORKSHEET INSTRUCTIONS:**

If your treatment plant uses surface or GWUDI (groundwater under direct influence of surface water) sources, the LT2 rule requires that you monitor each source for *Cryptosporidium*, *E.coli* and turbidity once a month over a 2 year period. Please complete one column of this worksheet for each source.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b><u>Source Name</u></b> - List all sources that will be monitored for <i>Cryptosporidium</i>, <i>E.coli</i> and turbidity. Blending of two or more sources is permitted as long as it is prior to any chemical addition and the blended portions are representative of normal operations. Next to each source, indicate if it is "Blended" or "Not Blended". <i>Please list information for each source in a separate column.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b><u>Source Type</u></b> - For each source, state if it's a Flowing Stream, Lake/Reservoir or GWUDI.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b><u>Source Identification Number</u></b> - Be sure to list a source identification number for each source. Contact your local DEQ District office if you are uncertain of the source identification number for your source(s).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p><b><u>Source Water Sampling Location</u></b> - Please describe, in detail, the specific location where you will be collecting your samples. If your system has more than one source, you should collect your samples after the raw water from all sources is combined. Your sampling point(s) should be representative of water entering the treatment plant. If you have a raw water off-stream reservoir or storage, samples should be collected after the raw water storage/reservoir. If the raw water is not combined prior to treatment, you may need to composite samples from each source (recommended), or analyze separate samples from each source and calculate a weighted average. <u>Include a plant schematic with an arrow indicating your proposed LT2 sampling location.</u> Example plant schematics are available upon request.</p> |
| <p><b><u>Usage</u></b> - Please describe, in detail, the specific usage practices for each source - "All year" or "Part-Year/Seasonal"- for your source in recent years and describe the anticipated use in future years. For Part-Year/Seasonal sources, include the months of operation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p><b><u>Proportion of Flow</u></b> - Provide the most accurate information available regarding the % of average yearly flow that each source contributes. After providing information for all sources, please clearly indicate which source is your primary. Your primary source is the source that clearly provides the majority of water on a yearly basis to the treatment plant.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><b><u>Presedimentation, Bank Filtration, or Off-Stream Storage (if applicable)</u></b> - If you utilize any of these practices, please include them in your plant schematic and indicate if your samples will be collected before or after these practices.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b><u>Recycling Practices (if applicable)</u></b> - If your plant recycles filter backwash water or other waste streams, you must indicate the point where the recycled backwash re-enters the treatment process. Your sampling point should be prior to the location where recycled streams come back into the treatment process. If you do not recycle, please state "Do not recycle" on your plant schematic. Samples collected after recycling will be invalidated; re-sampling will be required.</p>                                                                                                                                                                                                                                                                                                                                               |
| <p><b><u>Chemical Pretreatment</u></b> - On the plant schematic, indicate chemical feed locations from the intake to the plant. Your sampling point must be prior to any chemical treatment. If you feed any chemical(s) prior to your sampling point, you need to include this information in your sampling worksheet. Samples containing treatment chemicals will be invalidated; re-sampling will be required.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><b><u>Sample Compositing Procedure</u></b> - If a blended sample location prior to chemical addition is available, you should collect one blended sample from this location. If such a sample location is not available, plants may choose to sample each blended source separately. In this case, a composite sample representing % contribution of each source is needed. Describe Compositing in detail. A system may request to evaluate blended sources separately in order to provide additional information on <i>Cryptosporidium</i> loading for each source.</p>                                                                                                                                                                                                                                                                               |

Note: Collection of at least one matrix spike sample for every 20 *Cryptosporidium* samples is required and should be documented in the sampling plan schedule (i.e. at least two matrix spike samples are needed for 24 *Cryptosporidium* samples).

## Long Term 2 Enhanced Surface Water Treatment Rule Source Water Sampling Location Worksheet

Public Water System (PWS) Name: \_\_\_\_\_ WSSN: \_\_\_\_\_

Water Treatment Plant Name: \_\_\_\_\_

Water Treatment Plant ID: \_\_\_\_\_

Name and Phone Number of Person completing this Form: \_\_\_\_\_

|                                                                                                                                 |         |         |
|---------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| <b>Source Name</b>                                                                                                              |         |         |
| <b><u>Source Type</u></b><br>Flowing Stream<br>Lake/Reservoir<br>GWUDI - Ground Water Under the Influence of Surface Water      |         |         |
| <b>Source Identification Number</b>                                                                                             |         |         |
| <b>Source Water Sampling Location</b><br>(Raw water tap or sampled at source, indicate location on schematic)                   |         |         |
| <b><u>Usage</u></b><br>Operational – almost all the time<br>Demand – a few times a year<br>Emergency – fewer than once per year |         |         |
| <b>Proportion of Typical Average Daily Flow</b> (if only 1 source, 100%)                                                        | _____ % | _____ % |
| <b><u>Pretreatment Practices</u> (if applicable)</b><br>None<br>Presedimentation<br>Bank filtration<br>Other – write in         |         |         |
| <b>Recycling Practices (yes or no)</b><br>(If yes, describe and indicate location on schematic)                                 |         |         |
| <b>Chemical Pretreatment (yes or no)</b><br>(If yes, describe and indicate location on schematic)                               |         |         |
| <b>Compositing Procedure (yes or no)</b><br>(If yes, state if using blended sample tap, composite sample, or weighted)          |         |         |

Use additional sheets to provide more information.

I acknowledge that water system staff will notify the DEQ immediately upon discovery of any issues related to timely source water sample collection or accurate lab analysis of samples.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date





**Michigan Certified Laboratories for Cryptosporidium Analysis**  
**Michigan Department of Environmental Quality**  
**Remediation and Redevelopment Division**  
**Laboratory Services Section**  
**Laboratory Certification Officer: Gregg A Lundy**  
**Chief of Laboratory Services: George L. Krisztian**  
**Date of Report: July 15, 2014**

**Phone: (517) 335-9800 Fax: (517) 335-9600**  
**Phone: (517) 335-9219**  
**Phone: (517) 335-8812**

**Michigan DEQ Certified In State Laboratories**

| <b>Laboratory Name / Address /Contact Information</b>                                                                                                       | <b>Michigan Laboratory ID #</b> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Michigan State University<br>Environmental and Molecular Microbiology Laboratory<br>480 Wilson Road, 3 Natural Resources Building<br>East Lansing, MI 48824 | 9982                            |
| Contact: Rebecca Ives<br>Phone: (517) 432-8185<br>Fax: (517) 432-1699<br>Email: ivesrebe@msu.edu                                                            |                                 |

**Michigan DEQ Certified Out of State Laboratories**

| <b>Laboratory Name / Address /Contact Information</b>                                                              | <b>Michigan Laboratory ID #</b> |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------|
| EMSL Analytical, Inc.<br>Cinnaminson, New Jersey Laboratory<br>200 Route 130 North<br>Cinnaminson, NJ 08077        | 9970                            |
| Contact: Helen MacMinn<br>Phone: (856) 303-2584<br>Fax: (856) 786-5971<br>Email: hmacminn@emsl.com                 |                                 |
| Eurofins Eaton Analytical, Inc.<br>South Bend, Indiana Laboratory<br>110 South Hill Street<br>South Bend, IN 46617 | 9926                            |
| Contact: Dale Piechocki<br>Phone: (574) 472 5523<br>Fax: (574) 233-8207<br>Email: dalepiechocki@eurofinsus.com     |                                 |

**Laboratory Name / Address /Contact Information****Michigan Laboratory ID #**

Scientific Methods Inc.  
12441 Beckley Street  
Granger, IN 46530

9984

Contact: Matt Hayes  
Phone: (574) 277-4078  
Fax: (574) 968-0269  
Email: matt@scientificmethods.com

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, June 24, 2015 12:07 PM  
**To:** Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** FW: LT2 Source Water Sampling Plan - Reviewer's Checklist  
**Attachments:** Schedule 1 - 3 Reviewer Checklist.docx; Monitoring Plan Approval letter Sch 2 plants.docx

FYI, Regarding Flint LT2 plan.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Cook, Pat (DEQ)  
**Sent:** Wednesday, June 24, 2015 10:26 AM  
**To:** London, Bob (DEQ); Prysby, Mike (DEQ); Dehtiar, Luke (DEQ)  
**Cc:** Busch, Stephen (DEQ)  
**Subject:** LT2 Source Water Sampling Plan - Reviewer's Checklist

Hello Bob, Mike and Luke,

Hopefully you have already received, or will be receiving by July 1<sup>st</sup> deadline, the LT2 Source Water Monitoring Plans for the 2<sup>nd</sup> round of sampling from the Schedule 2 WTPs in your district (Flint, Wyoming and all the plants getting raw water from the Saginaw-Midland pipeline). The next step is to review them and either approve 'em, or request missing or incomplete information if some is needed. In order to assist you in reviewing the plans, attached is a Reviewers Checklist that EPA staff used for the first round of monitoring back in 2006. The checklist contains the items that you should be looking for when reviewing and approving the plans. I recommend that you complete the checklist when (and if) you approve the plans and place your name and date in the bottom line and attach it to the plan and place it in the appropriate file for safe keeping.

Also attached is a sample letter that you may use to notify the systems that their Source Water Monitoring Plans for the 2nd round of sampling is approved (assuming that you have reviewed and approved them). Please feel free to modify the letter as you see fit.

If you have any questions about these issues, please give me a call.

Patrick Cook, P.E.  
 Community Drinking Water Unit  
 Office of Drinking Water & Municipal Assistance  
 Michigan Department of Environmental Quality  
 Phone: (517) 284-6514  
[cookp@michigan.gov](mailto:cookp@michigan.gov)

|                                                                                       |  |                                                                                                                                                                                          |  |                                                                                                 |  |                                                                                                 |  |
|---------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------|--|
| <b>LT2 SCHED 1 - 3 SWM CHECKLIST</b>                                                  |  |                                                                                                                                                                                          |  | <b>RECEIVED</b>                                                                                 |  |                                                                                                 |  |
| PWS NAME                                                                              |  |                                                                                                                                                                                          |  | PWSID                                                                                           |  |                                                                                                 |  |
| FACILITY NAME                                                                         |  |                                                                                                                                                                                          |  | FACILITY ID                                                                                     |  |                                                                                                 |  |
| <b>SUBMITTAL SUMMARY</b>                                                              |  |                                                                                                                                                                                          |  |                                                                                                 |  |                                                                                                 |  |
| INTENT TO TREAT                                                                       |  | <input type="checkbox"/> N/A <input type="checkbox"/> SIGNED/ACCEPTABLE                                                                                                                  |  | TREATMENT DATE:                                                                                 |  |                                                                                                 |  |
| SAMPLING DATES                                                                        |  | <input type="checkbox"/> COMPLETE/ACCEPTABLE (DATE):                                                                                                                                     |  |                                                                                                 |  |                                                                                                 |  |
| SCHEMATIC                                                                             |  | <input type="checkbox"/> COMPLETE/ACCEPTABLE (DATE):                                                                                                                                     |  |                                                                                                 |  |                                                                                                 |  |
| WORKSHEET                                                                             |  | <input type="checkbox"/> COMPLETE/ACCEPTABLE (DATE):                                                                                                                                     |  |                                                                                                 |  |                                                                                                 |  |
| LAB INFO                                                                              |  | <input type="checkbox"/> COMPLETE/ACCEPTABLE (DATE):                                                                                                                                     |  |                                                                                                 |  |                                                                                                 |  |
| ADDITIONAL INFO NEEDED                                                                |  | <input type="checkbox"/> YES <input type="checkbox"/> N/A (ADD BELOW IF YES)                                                                                                             |  |                                                                                                 |  |                                                                                                 |  |
| ADDITIONAL INFO REQUESTED                                                             |  | <input type="checkbox"/> YES <input type="checkbox"/> N/A                                                                                                                                |  | DATE:                                                                                           |  | VIA: <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> Email |  |
| <b>SOURCE WATER MONITORING SCHEDULE</b>                                               |  |                                                                                                                                                                                          |  |                                                                                                 |  |                                                                                                 |  |
| SAMPLING DATES                                                                        |  | Total # of Samples                                                                                                                                                                       |  | Begin Date                                                                                      |  | End Date                                                                                        |  |
| MONITORING<br>SCHEDULE<br>COMMENTS                                                    |  | <input type="checkbox"/> SAMPLES NOT EVENLY SPACED                                                                                                                                       |  | <input type="checkbox"/> INSUFFICIENT NUMBER OF SAMPLES                                         |  |                                                                                                 |  |
|                                                                                       |  | <input type="checkbox"/> REVISED INTENT REQUIRED                                                                                                                                         |  | <input type="checkbox"/> REVISED SAMPLE SCHEDULE REQUIRED                                       |  |                                                                                                 |  |
|                                                                                       |  | NOTES:                                                                                                                                                                                   |  |                                                                                                 |  |                                                                                                 |  |
| <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A |  | SAMPLE SCHEDULE COMPLETE/ACCEPTABLE?                                                                                                                                                     |  |                                                                                                 |  |                                                                                                 |  |
| <b>SOURCE WATER MONITORING LOCATION</b>                                               |  |                                                                                                                                                                                          |  |                                                                                                 |  |                                                                                                 |  |
| <input type="checkbox"/> YES <input type="checkbox"/> NO                              |  | Schematic acceptable? [Shows location of sampling point in relation to all sources and plant, including all points of chemical addition]                                                 |  |                                                                                                 |  |                                                                                                 |  |
| <input type="checkbox"/> YES <input type="checkbox"/> NO                              |  | Worksheet acceptable? [Provides sufficient detail on source usage, chemical addition, etc., to allow reviewer to make a decision regarding the acceptability of the monitoring location] |  |                                                                                                 |  |                                                                                                 |  |
| SAMPLE TYPE                                                                           |  | <input type="checkbox"/> N/A <input type="checkbox"/> BLENDED <input type="checkbox"/> COMPOSITE <input type="checkbox"/> WEIGHTED                                                       |  |                                                                                                 |  |                                                                                                 |  |
| <input type="checkbox"/> YES <input type="checkbox"/> NO                              |  | Sampling point is prior to all chemical addition, pretreatment and filter backwash recycling? If no, check all boxes below that apply.                                                   |  |                                                                                                 |  |                                                                                                 |  |
|                                                                                       |  | <input type="checkbox"/> KMNO4/CI <input type="checkbox"/> CUSO4 <input type="checkbox"/> FILTER BACKWASH RECYCLE <input type="checkbox"/> OTHER                                         |  |                                                                                                 |  |                                                                                                 |  |
|                                                                                       |  | NOTES:                                                                                                                                                                                   |  |                                                                                                 |  |                                                                                                 |  |
| <input type="checkbox"/> YES <input type="checkbox"/> NO                              |  | SAMPLE LOCATION ACCEPTABLE? <input type="checkbox"/> AS IS <input type="checkbox"/> WITH CONDITIONS FOR ABOVE                                                                            |  |                                                                                                 |  |                                                                                                 |  |
| <b>LABORATORY INFORMATION</b>                                                         |  |                                                                                                                                                                                          |  |                                                                                                 |  |                                                                                                 |  |
| LAB ON LIST?                                                                          |  | <input type="checkbox"/> YES <input type="checkbox"/> NO                                                                                                                                 |  | LAB NAME                                                                                        |  | LAB ID                                                                                          |  |
| LAB CERTIFICATE SUBMITTED?                                                            |  | <input type="checkbox"/> YES <input type="checkbox"/> N/A                                                                                                                                |  | LAB CERT OK?                                                                                    |  | <input type="checkbox"/> YES <input type="checkbox"/> NO                                        |  |
| <b>NOTES/FOLLOW UP ITEMS</b>                                                          |  |                                                                                                                                                                                          |  |                                                                                                 |  |                                                                                                 |  |
|                                                                                       |  |                                                                                                                                                                                          |  |                                                                                                 |  |                                                                                                 |  |
| PWS NOTIFIED? <input type="checkbox"/> Y <input type="checkbox"/> N                   |  | DATE:                                                                                                                                                                                    |  | VIA: <input type="checkbox"/> EMAIL <input type="checkbox"/> PHONE <input type="checkbox"/> FAX |  | RESPONSE DUE:                                                                                   |  |
| Reviewer:                                                                             |  |                                                                                                                                                                                          |  |                                                                                                 |  | Approval Date:                                                                                  |  |



Date:

To: Schedule 2 Plants

Address:

Dear:

SUBJECT: Approval of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2),  
2<sup>nd</sup> Round of Source Water Monitoring Plan

This letter is to notify you that the Michigan Department of Environmental Quality (DEQ), Office of Drinking Water and Municipal Assistance has reviewed and approved your system's LT2 Round 2 Sampling - Source Water Monitoring Plan.

**Next Steps**

1. Collect *Cryptosporidium*, *E. coli*, and turbidity samples at the location and on the dates noted in your plan every month for 24 months starting in October 2015.
2. Samples must be collected prior to the addition of any chemicals such as disinfectants and oxidants. If your system feeds any chemicals prior to your sampling point, the use of these chemicals must be temporarily discontinued for a period of time prior to the collection of your source water samples.
3. If your plant recycles filter backwash water or other waste streams, the samples must be collected prior to the point where recycled streams enter into the treatment process.
4. Sample results must be reported the appropriate DEQ District Office no later than 10 days after the end of the month following the month in which samples are collected. As an example, samples collected in October 2015 must be reported no later than December 10, 2015.
5. Once all required source water samples are collected, a bin classification will need to be determined for your system. Your bin classification determines whether further treatment for *Cryptosporidium* is required, and must be reported to the DEQ within 6 months after the sampling has been completed, or by March 31, 2018.

If you have any questions about this subject, please contact this office.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, August 20, 2014 4:21 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: Media contact

FYI. Just in case you heard about this, it is downstream with no impact to the WTP.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Bennett, Charles (DEQ)  
**Sent:** Wednesday, August 20, 2014 4:19 PM  
**To:** Wurfel, Brad (DEQ); Sygo, Jim (DEQ); Feuerstein, Heather (DEQ); Tommasulo, Karen (DEQ); Creal, William (DEQ); Fish, Kim (DEQ)  
**Cc:** Smith, Laura (DEQ); Vanportfleet, Jennifer (DEQ); Bartley, Cheryl (DEQ); Ostlund, Peter (DEQ); Busch, Stephen (DEQ)  
**Subject:** Media contact

Phone interview with Mr. Randy Conath, TV12 Flint, 8/20/2014, 4:05p.

Mr Conath was specifically interested in today's incident which occurred at the 3<sup>rd</sup> Ave PS. The discharge of raw sewage began at 5:20a and lasted until 2:15p, with an estimated discharge of 3.75 MG. He was reporting from the site so he actually just wanted me to verify a few of the details which he already knew. I did say that residents would normally want to avoid bodily contact with the river, but that the county Health Department makes that determination. He was aware also that this incident occurred downstream of the Flint drinking water plant intake and that the integrity of that system was not affected by this incident.

Charles Bennett, PE  
 DEQ Water Resources Division  
 Lansing District Office  
[BennettC4@michigan.gov](mailto:BennettC4@michigan.gov)  
 ph 517-284-6659; fax 517-241-3571

---

**From:** Bennett, Charles (DEQ)  
**Sent:** Wednesday, August 20, 2014 11:25 AM  
**To:** Wurfel, Brad (DEQ); Sygo, Jim (DEQ); Feuerstein, Heather (DEQ); Tommasulo, Karen (DEQ); Creal, William (DEQ); Fish, Kim (DEQ)  
**Cc:** Smith, Laura (DEQ); Vanportfleet, Jennifer (DEQ); Bartley, Cheryl (DEQ); Ostlund, Peter (DEQ)  
**Subject:** Flint Journal contact

Ron Fonger for the Flint Journal inquired about an SSO event in Flint (8/11&12/2014). Flint just sent us the final report listing discharge volume at 12.3 MG, a significantly large event that occurred due to heavy rainfall.

Apparently treatment and storage capacity is being discussed again at city council meetings. Mr. Fonger wanted to know what the consequences of this discharge are for Flint. Is it permitted, etc? The discharge is not permitted and

corrections are addressed in the NPDES permit, although much more work needs to be done to improve their collection system.

I shared with Mr. Fonger that we also received a report this morning that Flint is experiencing a power outage at the Third Ave Pump Station (Flint's primary pump station) and discharging sewage to the river at this time. The power failure appears to be the result of local problems (accident or fire?) with the Consumers Energy electrical distribution system. I have spoken with the Flint WWTP Superintendent and directed him to contact me as soon as he learns that power has been restored.

chuck

Charles Bennett, PE  
DEQ Water Resources Division  
Lansing District Office  
[BennettC4@michigan.gov](mailto:BennettC4@michigan.gov)  
ph 517-284-6659; fax 517-241-3571

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, February 05, 2015 12:48 PM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Subject:** FW: Need your help: TTHM reports statewide?  
**Attachments:** TTHM Stats - 02 05 2015.docx

Here is what we have on TTHM result info for now (attached). I think this will give you the context you are looking for.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Philip, Kris (DEQ)  
**Sent:** Thursday, February 05, 2015 12:42 PM  
**To:** Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)  
**Cc:** Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Subject:** RE: Need your help: TTHM reports statewide?

Attached is some *preliminary* context. With the quick turn-around, I do not have time to verify data or check my work. If additional and/or different data is needed, let me know. I have a meeting all afternoon, but am around tomorrow.

---

**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Thursday, February 05, 2015 10:49 AM  
**To:** Benzie, Richard (DEQ); Philip, Kris (DEQ)  
**Cc:** Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Subject:** FW: Need your help: TTHM reports statewide?

Can you help Mike and Steve frame the issue?

Not sure which neighboring community is being referenced here. I know we've looked at other communities with elevated levels. It's probably time to compile that information into a format that can be shared with Brad for his reference.

---

**From:** Wurfel, Brad (DEQ)  
**Sent:** Thursday, February 05, 2015 10:41 AM  
**To:** Shekter Smith, Liane (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Subject:** Need your help: TTHM reports statewide?

Hey, friends. Working with the Flint Journal on a look at TTHM. He noted that the neighboring community has struggled with it or at least is recently out of compliance with the standard. The ABC 12 water testing showed some samples higher than standard.

I'm working to help put the issue in context: It's not that uncommon. It's measured quarterly, which should reflect our long term concern with it, as opposed to other testing which is daily or hourly.

The natural question becomes how often do we find systems with elevated TTHM levels? Do we have reporting figures that would offer some perspective here?

I'm out for the day at 2 p.m. Please let me know.

b

Brad Wurfel  
Communications Director  
Michigan Department of Environmental Quality  
517-284-6713  
517-230-8006 cell

**CWS TTHM Monitoring under Stage 2 DDBP**  
(Preliminary data prepared 2/5/2015 based on SDWIS)

Total number of community water supplies (CWS): 1386

Number of CWS required to monitor for TTHM: 823

530 ground water supplies are required to monitor for TTHM

- 5 individual samples, representing 3 supplies, have been above 0.080 mg/L
- **NO** ground water supply has exceeded the TTHM MCL under Stage 2

293 surface water systems are required to monitor for TTHM (includes ground water under the influence of surface water)

- 105 individual samples, representing 52 supplies, have been above 0.080 mg/L
- **5** surface water supplies have exceeded the TTHM MCL
  - 02310 City of Flint
  - 00517 Beaver Road Area Water (Bay City customer)
  - 00518 Beaver Township (Bay City customer)
  - 05540 Portsmouth Township (Bay City customer)
  - 00980 Buena Vista (Saginaw customer) – RETURNED TO COMPLIANCE in early 2014

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, May 30, 2014 8:15 AM  
**To:** prysbym@michigan.gov  
**Subject:** FW: NRC#1084300

FYI. Additional email on Flint River.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Shirey, Kathleen (DEQ)  
**Sent:** Thursday, May 29, 2014 2:48 PM  
**To:** DEQ-PEAS; DEQ-PEAS-Lansing  
**Cc:** VanOtteren, Bruce (DNR); Yocum, William (DEQ)  
**Subject:** RE: NRC#1084300

RRD and Water Resources have it and are coordinating.

*Kathy Shirey*

Lansing District Supervisor  
 RRD  
 517-284-5150

---

**From:** DEQ-PEAS  
**Sent:** Thursday, May 29, 2014 2:40 PM  
**To:** DEQ-PEAS-Lansing  
**Cc:** VanOtteren, Bruce (DNR); Yocum, William (DEQ)  
**Subject:** Fwd: NRC#1084300

Sent from the PEAS On Call cell phone.

Begin forwarded message:

**From:** <HQS-PF-fldr-NRC@uscg.mil>  
**Date:** May 29, 2014 at 2:34:06 PM EDT  
**To:** <deq-peas@michigan.gov>, <vanotterenb@michigan.gov>, <wolfj1@michigan.gov>, <franksr1@michigan.gov>  
**Subject:** NRC#1084300

NATIONAL RESPONSE CENTER 1-800-424-8802

\*\*\*GOVERNMENT USE ONLY\*\*\*GOVERNMENT USE ONLY\*\*\*

Information released to a third party shall comply with any  
 applicable federal and/or state Freedom of Information and Privacy Laws

## Incident Report # 1084300

## INCIDENT DESCRIPTION

\*Report taken by: CIV BRANDON WEATHERLY at 14:25 on 29-MAY-14

Incident Type: UNKNOWN SHEEN

Incident Cause: UNKNOWN

Affected Area: FLINT RIVER

Incident was discovered on 28-MAY-14 at 09:20 local incident time.

Affected Medium: WATER FLINT RIVER

---

REPORTING PARTY

Name: THOMAS HUTCHINGS

Organization: CITY OF FLINT- WATER POLLUTION CONTROL  
FLINT, MI

PRIMARY Phone: (810)7667210

Type of Organization: LOCAL GOVERNMENT

---

SUSPECTED RESPONSIBLE PARTY

Name: THOMAS HUTCHINGS

Organization: CITY OF FLINT- WATER POLLUTION CONTROL

FLINT, MI

PRIMARY Phone: (810)7667210

---

INCIDENT LOCATION

300 NORTH CHEVROLET AVE. County: GENESEE

City: FLINT State: MI

UNKNOWN SHEEN INCIDENT- F13-WARD-14 (STORM SEWER OUTFALL SYSTEM)

---

RELEASED MATERIAL(S)

CHRIS Code: OUN Official Material Name: UNKNOWN OIL

Also Known As:

Qty Released: 0 UNKNOWN AMOUNT Qty in Water: 0 UNKNOWN AMOUNT

---

DESCRIPTION OF INCIDENT

THE CALLER IS REPORTING AN UNKNOWN SHEEN IN THE FLINT RIVER. THE CALLER STATED THAT AFTER HEAVY RAINS IT IS BELIEVED THAT THE PRODUCT

WAS WASHED OUT OF THE OUTFALL AT A FORMER CAR MANUFACTURER FACILITY.

---

SENSITIVE INFORMATION

---

INCIDENT DETAILS

Platform Rig Name:



Platform Letter:  
 Location Area ID:  
 Location Block ID:  
 OCSG Number:  
 OCSP Number:  
 State Lease Number:  
 Pier Dock Number:  
 Berth Slip Number:  
 ---SHEEN INFORMATION---  
 Sheen Color: BLUEISH  
 Sheen Odor Description:  
 Sheen Travel Direction:  
 Sheen Size Length: 100 FEET  
 Sheen Size Width: 4 INCHES  
 ---WATER INFORMATION---  
 Body of Water: FLINT RIVER  
 Tributary of:  
 Nearest River Mile Marker:  
 Water Supply Contaminated: UNKNOWN

---

#### IMPACT

Fire Involved: NO Fire Extinguished: UNKNOWN

INJURIES: NO Hospitalized: Empl/Crew: Passenger:  
 FATALITIES: NO Empl/Crew: Passenger: Occupant:  
 EVACUATIONS: NO Who Evacuated: Radius/Area:

Damages: NO

|                                     | Hours  | Direction of |
|-------------------------------------|--------|--------------|
| Closure Type Description of Closure | Closed | Closure      |
| N                                   |        |              |
| Air:                                |        |              |
| N                                   |        | Major        |
| Road:                               |        | Artery:N     |
| N                                   |        |              |
| Waterway:                           |        |              |
| N                                   |        |              |
| Track:                              |        |              |

Environmental Impact: UNKNOWN  
 Media Interest: UNKNOWN Community Impact due to Material:

---

#### REMEDIAL ACTIONS

DISSIPATE NATURALLY.  
 Release Secured: UNKNOWN  
 Release Rate:  
 Estimated Release Duration:

---

#### WEATHER

Weather: UNKNOWN, °F

---

ADDITIONAL AGENCIES NOTIFIED

Federal:

State/Local: PEEPS/CITY OF FLINT

State/Local On Scene:

State Agency Number:

---

NOTIFICATIONS BY NRC

DHS NOC (NOC)

29-MAY-14 14:33 (202)2828114

CG INVESTIGATIVE SERVICE DETROIT (RESIDENT AGENT OFFICE, DETROIT)

29-MAY-14 14:33 (586)2396759

CHIPPEWA OTTAWA RESOURCE AUTHORITY (COMMAND CENTER)

29-MAY-14 14:33 (906)6320043

DOT CRISIS MANAGEMENT CENTER (MAIN OFFICE)

29-MAY-14 14:33 (202)3661863

U.S. EPA V (MAIN OFFICE)

(312)3532318

MACKINAC COUNTY EMERGENCY MGMT (COMMAND CENTER)

29-MAY-14 14:33 (906)4301466

MICHIGAN DEPT OF COMMUNITY HEALTH (HSEES)

29-MAY-14 14:33 (517)3358364

MI INTELLIGENCE OPERATIONS CENTER (FUSION CENTER)

29-MAY-14 14:33 (517)2418000

NATIONAL INFRASTRUCTURE COORD CTR (MAIN OFFICE)

29-MAY-14 14:33 (202)2829201

NOAA RPTS FOR MI (MAIN OFFICE)

29-MAY-14 14:33 (206)5264911

NATIONAL RESPONSE CENTER HQ (AUTOMATIC REPORTS)

29-MAY-14 14:33 (202)2671136

OFFICE OF ENV. POLICY & COMPLIANCE (MAIN OFFICE)

29-MAY-14 14:33 (215)5975012

MICHIGAN DEQ (MAIN OFFICE)

29-MAY-14 14:33 (800)2924706

MICHIGAN DEQ (MAIN OFFICE 2)

29-MAY-14 14:33 (517)9305784

---

ADDITIONAL INFORMATION

CALLER WILL NOTIFY MI DEQ NEXT.

---

\*\*\* END INCIDENT REPORT #1084300 \*\*\*

Report any problems by calling 1-800-424-8802

PLEASE VISIT OUR WEB SITE AT <http://www.nrc.uscg.mil>

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, March 30, 2015 8:35 AM  
**To:** prysbym@michigan.gov  
**Subject:** FW: NYTimes.com: A Water Dilemma in Michigan: Cloudy or Costly?

FYI. Article on Flint.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Monosmith, Carrie (DEQ)  
**Sent:** Monday, March 30, 2015 7:58 AM  
**To:** Benzie, Richard (DEQ); Busch, Stephen (DEQ)  
**Subject:** FW: NYTimes.com: A Water Dilemma in Michigan: Cloudy or Costly?

Saw this over the weekend, fyi-Carrie

**From:** [emailthis@ms3.lga2.nytimes.com](mailto:emailthis@ms3.lga2.nytimes.com) [<mailto:emailthis@ms3.lga2.nytimes.com>]  
**Sent:** Saturday, March 28, 2015 11:39 AM  
**To:** Monosmith, Carrie (DEQ)  
**Subject:** NYTimes.com: A Water Dilemma in Michigan: Cloudy or Costly?

Sent by [monosmithc@gmail.com](mailto:monosmithc@gmail.com):



## A Water Dilemma in Michigan: Cloudy or Costly?

BY MITCH SMITH

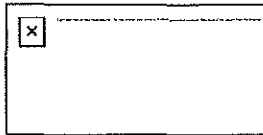
The troubled city of Flint says its supply is safe despite the development of odors and discoloration since a switch from Lake Huron to the Flint River.

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**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, March 27, 2013 4:44 PM  
**To:** prysbym@michigan.gov  
**Subject:** FW: ODWMA Response - Flint KWA-DWSD Report  
**Attachments:** KWA - DWSD for WRD.DOCX

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Sygo, Jim (DEQ)  
**Sent:** Wednesday, March 27, 2013 2:53 PM  
**To:** Busch, Stephen (DEQ)  
**Subject:** RE: ODWMA Response - Flint KWA-DWSD Report

Thought I would share with you some items that WRD came up with as well. AS you might guess we are in a situations with Emergency Financial Managers so it's entirely possible that they will be making decisions relative to cost. The concern in either situation is that a compliant supply of source water and drinking water can be supplied.

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, March 27, 2013 1:39 PM  
**To:** Thelen, Mary Beth (DEQ); Wyant, Dan (DEQ); Sygo, Jim (DEQ); Shekter Smith, Liane (DEQ)  
**Cc:** Willard, Veronica (DEQ); Benzie, Richard (DEQ); Prysby, Mike (DEQ); Bloemker, Jon (DEQ); Donaldson, Kristina (DEQ); Creal, William (DEQ)  
**Subject:** ODWMA Response - Flint KWA-DWSD Report  
**Importance:** High

Director Wyant, and Deputy Director Sygo,

Addendums to ODWMA comments provided yesterday regarding the City of Flint water system and comments on the reports from Tucker, Young, Jackson, Tull, Inc. (TYJT) can be found below in red. Additional comments are as follows:

With regards to regulatory authority for DEQ to allow or prevent the breakup of water utilities, and State vs. local decisions about cost effectiveness, it is important to note that when the DEQ permitted the water withdrawal for KWA (permit 2009-001) part of the decision making process (copy attached) included reasonable use and the balance of Economic Development, Social Development, and Environmental Protection. As part of the public participation process general comments were received (pages 6 & 7) regarding impacts on DWSD and rates to remaining customers. The Department's response to those comments stated:

"The DEQ is specifically precluded from using part 327 to "...diminish or create any existing authority of municipalities to require persons to connect to municipal water supply systems as authorized by law" (MCL 324.32726)."

And

"It is appropriately an issue for water service contract negotiations between the regional water system and its customers. To do otherwise invites unwanted intervention of the state into local decision making."

ODWMA cannot on its own assess an actual dollar value to any regional benefit for the City of Flint to remain a full customer of DWSD, but the following should be included in any additional analysis:

- The cost estimates provided in the TYJT report show a cost difference between full KWA and full DWSD participation of \$172 million over 30 years.
- The formation of KWA would itself be considered one of the largest regional drinking water authorities in the State in terms of capacity, and as such any regional benefits provided by DWSD may only be marginal in comparison.

Finally, we have additional questions for TYJT regarding the various DWSD supply options and the considerations they made in the operations of the Flint WTP. These considerations will have an impact on the cost estimates for DWSD options.

We look forward to further discussion of these comments during our meetings tomorrow, and please let us know if you have any additional questions for us between now and then.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, March 26, 2013 3:58 PM  
**To:** Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ)  
**Cc:** Willard, Veronica (DEQ); Shekter Smith, Liane (DEQ)  
**Subject:** RE: Flint Draft Response

I will provide additional follow up by tomorrow (Wed.) afternoon to my previous email below based on our discussion and the conference call with Andy Dillon earlier today.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, March 26, 2013 12:37 PM  
**To:** Wyant, Dan (DEQ); Thelen, Mary Beth (DEQ); Sygo, Jim (DEQ)  
**Cc:** Willard, Veronica (DEQ); Shekter Smith, Liane (DEQ)  
**Subject:** Flint Draft Response

Director Wyant,

In preparation for our call today with Treasurer Dillon's office, ODWMA has developed the following for consideration. We can provide any additional info you require during the meeting.

ODWMA has reviewed the materials developed by the consultant Tucker, Young, Jackson, Tull, Inc. (TYJT) for Treasury regarding the City of Flint and potential alternatives for public water supply. Based on our reviews, we have developed the following comments to this point in our analysis:

1. The TYJT report does not contain the full scope of the Karegnondi Water Authority (KWA) raw water supply system. TYJT concerns over raw water supply redundancy and reliability are addressed to the satisfaction of ODWMA under the full KWA proposal. Please note some portions of the overall project are being financed independently by the Genesee County Drain Commission.
2. There are significant differences in contract language between KWA and Detroit Water and Sewerage Department (DWSD) with respect to the contracted maximum day demand capacity.
  - a. Under a KWA contract, a "maximum day" capacity of 18 million gallons per day (MGD) would fully satisfy current demands of the City of Flint, without the need to supplement raw water capacity using the Flint River. (18 MGD, average over a 30 day period).
  - b. Under a DWSD model contract, a "maximum day" capacity, even at 18 MGD, would not satisfy the current demands for the City of Flint. (18 MGD, over any 24 hour period).
3. Restrictions in contracted capacity that would prevent the City of Flint from meeting peak demand requirements present potential limits to economic development within the City of Flint, including possible connection bans and water system extension bans. This information was previously conveyed to the City of Flint by ODWMA staff.
4. All contract options with DWSD that are considered semi-competitive with the KWA contract do not fully supply the City of Flint, and would require the City of Flint to meet a significant, if not majority, of its water demands by treating water from the Flint River. Continuous use of the Flint River at such demand rates would:
  - a. Pose an increased microbial risk to public health (Flint River vs. Lake Huron source water)
  - b. Pose an increased risk of disinfection by-product (carcinogen) exposure to public health (Flint River vs. Lake Huron source water)
  - c. Trigger additional regulatory requirements under the Michigan Safe Drinking Water Act (LT2ESWTR)
  - d. Require significant enhancements to treatment at the Flint WTP, beyond those identified in the TYJT report (see item 5 below).
  - e. Water Resource Division is evaluating potential impacts to NPDES wastewater discharge permits in downstream segments of the Flint River, as a result of decreased river baseflow caused by Flint WTP use.
5. The TYJT report does not adequately address increased requirements and costs associated with using the Flint River as a significant source for the Flint WTP, which are not necessary under a Lake Huron source water scenario. This includes:
  - a. The need to provide softening treatment
  - b. Limitations on disposal options for lime softening sludge
  - c. Increased ozone capacity, UV disinfection
  - d. Additional backup power, more power required for Flint River operation
6. The Flint WTP must operate at some minimum level and within a range of flow rates to maintain treatment effectiveness. Currently that minimum level is 9 MGD. This level may be reduced with additional capital costs to modify the WTP, not addressed in the TYJT report.
7. Allowing Flint WTP to blend water with DWSD sets a new precedent that could pose future consequences with other DWSD customers.
8. Costs impacts to remaining DWSD customers would be similar under the proposed scenarios, only retaining 8 MGD of 30+ MGD total Flint/Genesee Co. demands, based on the following:
  - a. Genesee County distribution system demands are pulling out of DWSD regardless of the decisions by Flint WTP
  - b. Flint's need to utilize the Flint River as a source

9. ODWMA anticipates cost savings under the KWA proposal will be leveraged to provide additional improvements to the City of Flint water distribution system, improving efficiency and providing additional cost benefits. The KWA water withdrawal permit (2009-001) includes the required implementation of conservation measures that would also drive these distribution system improvements.
10. Major cost discrepancies in TYJT analysis
  - a. Engineering, Legal, Administration, Contingency – TYJT appears to have effectively double charged for these costs in their KWA estimates without adequate justification
  - b. Pumping facilities – TYJT cost estimate methodology does not appear to address localized market costs and does not distinguish fixed and variable costs in its comparison analysis.
11. Remaining DWSD customers in Lapeer County could potentially see water quality impacts as a result of Flint joining KWA, if they remain with DWSD. However, indications to ODWMA are that these communities are currently in final negotiations with KWA for service, which would make this a non-issue.
  - a. City Lapeer
  - b. City of Imlay City

Additional response to the TYJT report has also been provided by Rowe Engineering to Flint EFM, Mr. Ed Kurtz. (Copy Attached)

ODWMA has continued to meet on a regular basis with KWA, Genesee County, and the City of Flint regarding these water supply proposals.

ODWMA will continue to provide any additional detailed analysis requested by Treasury or the DEQ Executive Office.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314



### City of Flint Water Supply Assessment (TYJT; for Treasury)

DEQ-Drinking Water engineers are responsible for this review. WRD offers one comment however. The KWA pump stations are not supplied with a secondary power source. It would appear that we should ask if this meets "10 States" for drinking water facilities. If power is lost to the pump stations, the Flint WTP would have to be used to supply finished water (with Flint River as the raw source, apparently). It would seem that independent secondary power sources should be provided to the KWA pumping stations to more reliably ensure Lake Huron as the source water.

### Potential Financial Impacts on the DWSD (Sewerage Fund):

It is difficult to quantify the potential financial impact of lost drinking water customers in Flint on the Sewerage Fund. Flint is supplied currently with DWSD drinking water but provides their own wastewater treatment. However, the following is offered:

- Some common functions in DWSD serve both Water and Sewerage. These include HR, purchasing, IT, legal, and top administration (including the Water Board). Further, under the proposed EMA organizational approach it appears that some services units would serve both water and sewer. It would follow that lost revenue to the Water Fund would have some incremental effect on the Sewerage Fund to make up for fixed costs.
- Lost revenue to the Water Fund would not translate to less outstanding water system debt. Would an increased level of water debt service to revenue result in a lower credit rating of an independent DWSD? The rating applies to DWSD as a whole. A lower rating would potentially increase costs to borrow on the sewerage side; for such items as CSO correction and WWTP improvements.
- Some have suggested that financial impact on residents consider both water rates and sewerage rates, combined. Although this is not what WRD currently does, should this type of assessment be presented in the future then lost revenue on the water side will increase costs to those remaining in DWSD (to cover the fixed costs). This could potentially increase the residential financial costs as a % of MHI for City residents, and thus further lengthen the time needed to completed non-core CSO corrections as described in the new permit.

### Effects on NPDES Dischargers:

- 1) Which NPDES permits would be affected?

Flint WWTP, Flushing WWTP, and Genesee Co-Ragnone WWTP are in the Flint River model/WLA, so all of these and no others are potentially affected (at least in this immediately d/s WLA).

- 2) Would we expect permit limits would be modified as a result of this proposal (and decreased background flows)?

Since it appears the withdrawal would be near the head of or upstream of the modeled reaches, it would be assumed that all three facilities' limits would become more restrictive, depending on how we approach any load reductions to meet the DO std.

- 3) What would be the percent reduction in flow coming out of Holloway Reservoir?

A 1988 WRC 'ruling' requires that Holloway Reservoir release 85 cfs minimum in the summer, fall, and winter seasons. 232.4 cfs was used in spring modeling. 10 MGD = 15.5 cfs, so

$15.5 \text{ cfs} / 85 \text{ cfs} = 18.2\% \text{ reduction}$   
69.5 cfs would remain

The withdrawal is below Holloway Reservoir, so the flow out of the reservoir itself wouldn't have to change, but the flow at the first WLA facility (Flint WWTP) is reduced. Maybe the Holloway release flow could be increased 10 MGD. Erik believes that the 85 cfs minimum was to protect the fishery.

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, February 17, 2015 9:15 AM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: Outreach team meeting notes  
**Attachments:** 150212. Outreach team meeting notes.docx; OEA Services Toolbox.docx; DEQ Guide 1-16.pdf; govDelivery brochure - December 2014.pdf; RE: Outreach team meeting notes

FYI. See attached meeting notes document. The notes on Flint are rather extensive and I'm not sure who they came from. This is being passed from the communications team back to the district coordinators and then out to the other DS's and potentially to their staff. I'm a little concerned about information being distributed in this fashion without any additional oversight or opportunity to review the draft not knowing where its coming from. There is potential for mixed messaging that differs from the talking points we have already developed. Most of the other topics have very brief bullet points.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Adelman, Mitch (DEQ)  
**Sent:** Friday, February 13, 2015 4:20 PM  
**To:** Bean, Lawrence (DEQ); Busch, Stephen (DEQ); Miller, Scott (DEQ); Russell, Jon (DEQ); Schineman, Louis (DEQ); Seibenick, Jeff (DEQ)  
**Cc:** Sygo, Jim (DEQ); McClellan, Michael (DEQ); Campbell, Matthew (DEQ); Brown, Angela (DEQ); Tommasulo, Karen (DEQ); Aimar, Jennifer (DEQ); Aronoff, Lori (DEQ); Cogger, Jim (DEQ); Greer, Linda (DEQ); Hamel, Daniel (DEQ); Hiske, Terry (DEQ); Kolon, Sybil (DEQ); Lund, Kevin (DEQ); Doxtader, Sheryl (DEQ)  
**Subject:** FW: Outreach team meeting notes

Notes and other attachments from yesterday's communications team meeting are attached. I had to leave the call early, so see also the note I sent to Karen summarizing stuff I would have brought up had I not had a conflict.

Good, long weekend to all, and stay warm!

Mitch

---

**From:** Tommasulo, Karen (DEQ)  
**Sent:** Friday, February 13, 2015 3:01 PM  
**To:** Flechter, Matt (DEQ); DeBruler, Carl (DEQ); Pearson, Sara (DEQ); Acevedo, Jennifer (DEQ); Woods, Vence (DEQ); Wygant, Adam (DEQ); Snow, Mark (DEQ); Berman, Jonathan (DEQ); Sweet, Robert (DEQ); Adelman, Mitch (DEQ); Casey, Steve (DEQ); Hare, Chris (DEQ); Hartz, Andrew (DEQ); Hollenbach, Heidi (DEQ); Bean, Lawrence (DEQ); Roycraft, Phil (DEQ); Sellers, Fred (DEQ)  
**Cc:** Feuerstein, Heather (DEQ)  
**Subject:** Outreach team meeting notes

Here's notes from yesterday's outreach meeting. Please let me know if I missed anything important.

Thanks all! See you next month. Feel free to let me know if something comes up in the meantime.

Karen Tommasulo  
Public Information Officer  
Michigan Department of Environmental Quality  
517-284-6716 | 517-599-5733  
[tommasulok@michigan.gov](mailto:tommasulok@michigan.gov)

## Outreach Team Meeting Notes

Feb. 12, 2015

### AQD

Detroit Bulk Storage pet coke reapplication

- Currently reviewing permit to install application to decide whether to accept it or deny it
- Will receive significant public interest if we accept

### EIS

IES case, Brighton

- Poured hydrogen peroxide into monitoring wells to falsify results where known contamination from LUSTs existed
- Preliminary exam conference held Dec. 5, 2014

Bodies of Dead Animals case, Lapeer

- Several horses buried in a pit
- Charged with 7 misdemeanors, arraigned Jan. 28
- DEQ looking at any contamination

### ODWMA

Flint drinking water

Last spring, the city of Flint decided to begin relying upon the Flint River as their source of drinking water using a treatment plant that was designed to do so. Last summer, the city experienced difficulties with stagnation in some areas of the distribution system due to significantly reduced demands resulting from the loss of a significant percentage of their residential and industrial demands that accelerated over the last decade. During the summer of 2014, they also had a couple of monitoring periods where they detected total coliform at monitoring sites in these stagnant areas, and one time they detected E.coli present. The ensuing boil water advisories and public notification heightened customer concern about the quality of drinking water and the switch from Detroit to the Flint River. Detroit supplied Flint with drinking water from Lake Huron, a much higher quality source than the Flint River. However, monitoring of the Flint water treatment plant tap has never indicated unacceptable water entering the distribution system. In response to these coliform detections and in an effort to prevent a recurrence, the city also increased flushing water mains in low flow areas and they have attempted to ensure the presence of a chlorine residual throughout the distribution system.

Compounding the problem of customer confidence was the results of initial monitoring for disinfection byproducts under the Stage 2 Disinfection Byproducts Rule. The initial monitoring reported significantly elevated levels of total trihalomethane (TTHM) compounds throughout the city's distribution system. Our district office advised the city that they needed to immediately implement operational techniques at the treatment plant and in the distribution system to reduce the formation of these compounds. The steps the city has taken have been successful and have reduced TTHM concentrations to the point where the latest results are below the drinking water standard. However, the standard is calculated on a running annual average and it is likely to be another 3 to 6 months before the annual average at each monitoring station will (hopefully) meet the standard. Until then, the city has to continue to provide quarterly public notification, which will continue to concern residents despite the latest TTHM results.

The switch to the Flint River, the microbiological problems, and the elevated TTHM concentrations experienced last year have caused a high level of customer dissatisfaction and distrust in Flint. The city is working diligently to restore that confidence, but it will not be accomplished easily or overnight. The city's switch to the Flint River is an interim measure intended to last only until a 72-inch pipeline from Lake Huron to the Flint water treatment plant is completed. It is currently under construction and expected to be in operation in mid-2016. At that point, the city's drinking water should again be very similar in quality to what they were receiving from Detroit.

#### State Revolving Loan Fund, new federal requirements

- Water Resources Reform and Development Act (WRRDA), beginning FY2016
- Qualification-based selection process will be required for all architectural and engineering contracts for SRF-financed projects
- SRF loan recipients will be required to implement a fiscal sustainability plan
- March 12 webinar to help people understand changes

#### Revolving Loan Section general updates

- 2<sup>nd</sup> round SAW grants were issued November 2014
- 1<sup>st</sup> quarter loan closings in December 2014: 4 SRF loans of \$24.95 million total, 1 DWRF loan for \$7 million
- Disadvantaged determinations now extended to SRF, where such applicants would be awarded an additional 50 points on the priority list

#### OEA

##### Outreach toolkit available (see attachment)

- OEA willing to present on the road to districts

New DEQ Guide available (see attachment)  
 New GovDelivery cards available (see attachment)

### OOGM

#### Residential drilling rules

- Instruction will become effective Feb. 24
- Applies residentially zoned, high home density areas in SE Michigan tri-county area (Wayne, Oakland, Macomb)
- Developed in Fall 2014 through DEQ lead multi-stakeholder workgroup
- Provides additional requirements specific to these types of areas to minimize land use conflicts during drilling, many of which are quality of life type requirements for noise, lighting, and aesthetics

#### Hydraulic fracturing rules

- Proposed Administrative Rules for Hydraulic Fracturing are currently in process and are in Joint Committee for Administrative Rules
- Rule changes will address agency and stakeholder-identified concerns and risk abating requirements for high-volume fracturing
- Rules also revise certain sections related to pooling to form drilling units, well pattern spacing, injection and other general housekeeping of outdated portions of Part 615

#### UM Graham Institute Integrative Assessment on Hydraulic Fracturing in Michigan, draft release

- Contains policy options for regulation of hydraulic fracturing
- Public will have opportunity to comment
- DEQ will react when draft is released – many policy options are likely already addressed in our proposed rule change

#### Underground Injection – Brine Disposal Well in Monroe County

- Trendwell Energy, Secor D4-18 SWD
- Saltwater disposal well proposed in Summerfield Township, Monroe County
- Proposed to handle disposal of brine produced in conjunction with recent local oil well development in the area
- Citizens have asked EPA and DEQ to hold a public meeting prior to making a permit decision. EPA and DEQ are working to set up this public meeting for community engagement
- OOGM continues to review the area geology and drilling plan for the proposed application. Focusing on casing, sealing, cementing, area karst and lost circulation potential

### OWMRP

#### Beneficial use outreach program

- Outreach in progress
- Webinar held Feb. 12

- Duane Roskoskey is lead

#### TENORM Disposal Panel

- Report released Friday, Feb. 13
- Found Michigan's current disposal standard for low-activity radioactive waste is protective of public health and the environment
- [http://michigan.gov/documents/deq/deq-RMG-TENORM Disposal Advisory Panel White Paper - FINAL 481404 7.pdf](http://michigan.gov/documents/deq/deq-RMG-TENORM_Disposal_Advisory_Panel_White_Paper_-_FINAL_481404_7.pdf)
- Ken Yale is lead

#### Recycling

- Summit will be held May 5
- Matt Flechter is lead

#### Solid waste report

- Released Tuesday, Feb. 12
- Found waste from Michigan is up, waste from Canada is down
- [http://www.michigan.gov/documents/deq/DEQ-OWMRP-SWS-SolidWasteAnnualReportFY2014\\_481071\\_7.pdf](http://www.michigan.gov/documents/deq/DEQ-OWMRP-SWS-SolidWasteAnnualReportFY2014_481071_7.pdf)

#### RRD

##### Part 201 amendments (PA 542)

- Went into effect Jan. 15, 2015
- Significant changes to the Environmental Remediation Act
- Important to get information to staff and stakeholders to aid understanding

##### Creation of UST Corrective Action Fund

- PA 416
- Authority will be created
- Highlighted in Governor's budget announcement
- Stakeholders eager for status updates

#### Cadillac/Gaylord District

##### Village of Grand Traverse near Acme

- Meijer construction site, lots of soil erosion into the bay
- Clay on the hill makes it difficult to prevent runoff when it rains
- Residents upset

#### Grand Rapids District

##### Former Electrolux/Belding Products site, Belding

- Public hearing held Jan. 28 to take comment on No Further Action plan submitted to RRD



- Greenville Daily News Feb. 5: <http://thedailynews.cc/2015/01/30/belding-residents-express-frustration-with-deq-over-electrolux-property/>
- Locals upset

#### Electro Chemical Finishing, Grand Rapids

- Hex chrome release to Roy Creek
- Includes WRD, AQD, OWMRP violations

#### Former Birch Body Works site, Rockford

- Proposal to build condos on the old contaminated site
- Locals upset, want EPA involved: <http://woodtv.com/2015/02/09/rockford-residents-debate-condo-development/>
- Wetlands also present

#### Kalamazoo District

##### Great Lakes Trailer Washout

- New company cleaning out animal trailers and selling materials for land application
- Locals are upset, NIMBY issue
- Land application is allowed when done correctly
- Operator says one thing and does another

##### Orchard Hills Sanitary Landfill

- Odor complaints common
- Locals very upset
- General manager is politically active

##### Kalsec

- Herb, hops and jalapenos extracts
- Leftover vegetative materials are composted
- Locals don't like
- Has GAAMPS approval

#### Lansing District

##### Granger landfill

- Accepted Detroit sewage sludge, but has stopped
- Still letting off gas, creating odor issues
- Increased gas collection units, but will take time

#### Saginaw Bay District

##### Michigan Sugar

- Odor complaints
- Annual problem

Southeast District

Marysville-St. Clair County DTE Plant demolition

- Asbestos present in stacks
- Contractor wants to avoid abating correctly before imploding
- Contractor has been caught trying to bribe the fire department staff to have the building condemned so they can get rid of it without abating
- Canadians watching
- Significant public and political interest

## Office of Environmental Assistance

The Michigan Department of Environmental Quality (DEQ), Office of Environmental Assistance (OEA), has worked with divisions/offices for years to provide compliance assistance, education/outreach and incentives to businesses, institutions, municipalities, and the general public. The following is a list of the tools and services that the OEA provides to the DEQ divisions/offices that promote the mission of the DEQ and provide excellent customer service.

### Compliance Assistance and Education and Outreach Tools

- **Environmental Assistance Center (EAC)** – The EAC (800-662-9278 [deq-assist@michigan.gov](mailto:deq-assist@michigan.gov)) is the main access point to DEQ programs. The EAC analysts answer general questions about complying with DEQ regulations, provide guidance on Department forms and reporting, and direct customers to the DEQ program Web sites and contacts within the DEQ or other agencies.
- **One-on-one Environmental Assistance** – Compliance specialists in the OEA answer calls from businesses and the general public on a variety of topics. The specialists are committed to delivering this assistance in a timely manner. Many of the inquiries received are referrals from the DEQ program staff who have determined that the person would benefit from more detailed assistance from these specialists.
- **Publication Development** – The OEA works with regulatory divisions to develop fact sheets, workbooks, frequently asked questions, and other documents that explain how to comply with regulatory requirements. The documents can be accessed via the DEQ's Publication Center [www.deq.state.mi.us/pubcenter/](http://www.deq.state.mi.us/pubcenter/).
- **Print and Graphics Ordering Services** – The OEA can assist divisions/offices in designing and/or ordering printed copies of publications and other items such as posters, pencils, mugs, banners, etc.
- **Conferences/Workshops** - The OEA works with regulatory divisions/offices to coordinate and host live training events throughout the state that provide details on how to comply with specific requirements and promote a better understanding of how the DEQ programs are administered. The DEQ posts upcoming and past events at [www.michigan.gov/deqworkshops](http://www.michigan.gov/deqworkshops) (select "DEQ Workshops").
- **Webinars** – The OEA works with regulatory divisions/offices to host live online training events that provide compliance assistance details on how to comply with specific requirements and promote a better understanding of how the DEQ programs are administered. A listing of upcoming webinars and recording of past webinars can be accessed at [www.michigan.gov/deqworkshops](http://www.michigan.gov/deqworkshops) (select "DEQ Webinars").
- **On-demand Tutorials and Videos** – The OEA works with regulatory divisions to create and post on-demand tutorials and videos that provide details on how to comply with specific requirements, compliance assistance, and promote a better understanding of how the DEQ Programs are administered. The DEQ on-demand learning curriculum can be accessed at [www.michigan.gov/deqworkshops](http://www.michigan.gov/deqworkshops) (select "DEQ Online Learning Curriculum").

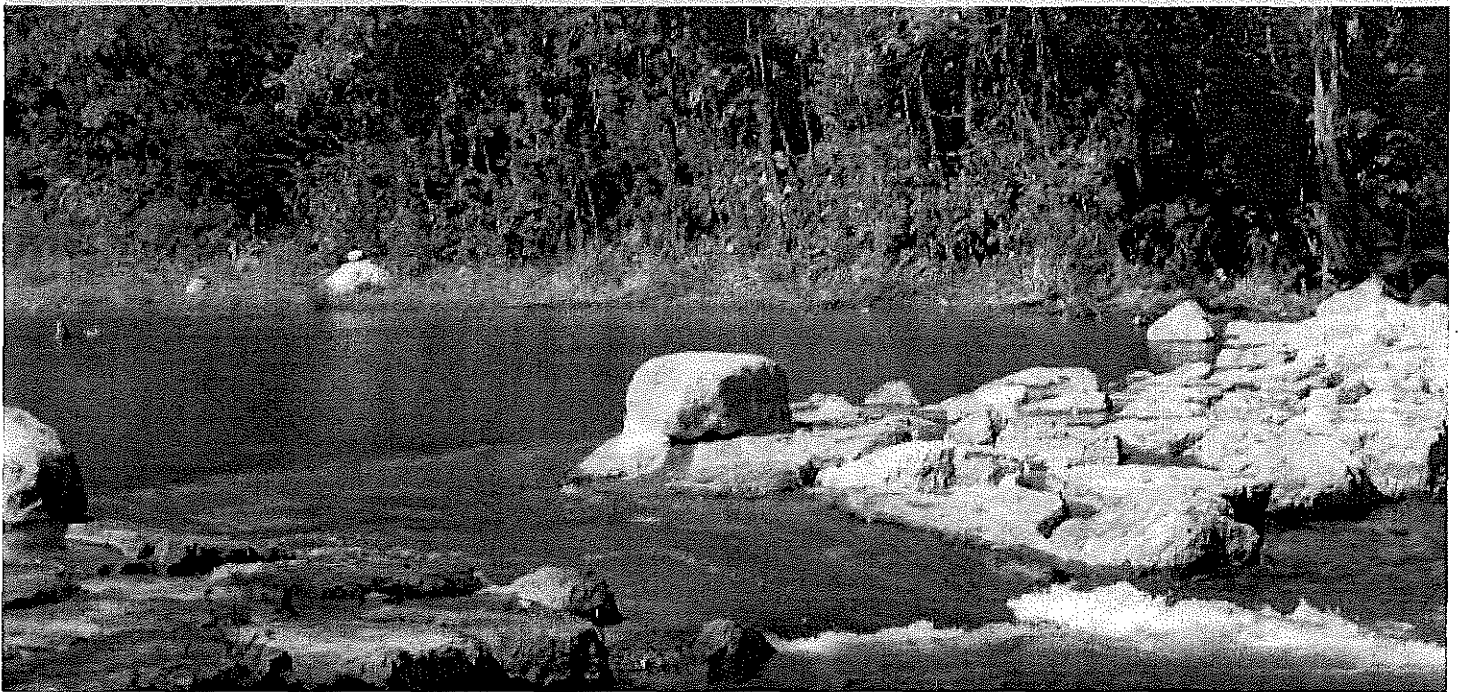
- **Compliance/Outreach Initiatives** – The OEA coordinates compliance/outreach initiatives that target specific business sectors or activities, which the DEQ regulatory divisions/offices have identified as having common compliance issues or new regulatory requirements. The initiatives include the development of specialized publications and training, aggressive outreach to the targeted sector, followed by a predictable enforcement strategy. Information about a recent initiative targeting auto body shops can be found at [www.michigan.gov/deqair](http://www.michigan.gov/deqair) under Clean Air Assistance (select Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources under “Federal Regulations.”)
- **Listserv/Newsletter Development** – The OEA coordinates the administration of the GovDelivery system. The DEQ Division/Program staff that needs assistance in creating a newsletter or listserv may contact the OEA for help.
- **Speakers Bureau** – The OEA Speakers Bureau coordinates requests for environmental speakers. Each inquiry is carefully evaluated to identify the needs of the audience and determine the most suitable presenter. Requests for speakers are given prompt, courteous attention, and are filled in a timely manner. Program staff that get requests for speakers for a particular event can refer the person to the speaker’s bureau <http://www.deq.state.mi.us/eforms/speakerrequest.html>.
- **Event Display Coordination** – The OEA can assist staff in identifying opportunities to display at stakeholder events throughout the state and prepare a display that can be used at the display including, table cloth, banner, posters, display boards, and handout materials.
- **Marketing/Outreach Assistance** – The OEA can assist the DEQ programs with getting new or existing information out to specific audiences utilizing stakeholder group contacts, listservs, newsletters, and other mass and targeted marketing techniques.
- **Survey Development** – The OEA can assist divisions/offices capture important survey data by preparing online surveys/evaluations that can be sent to target audiences. The OEA can manage create and manage the survey as well as prepare reports of collected survey data. Example surveys are posted at [www.michigan.gov/deqsurveys](http://www.michigan.gov/deqsurveys).
- **Permit Coordination** – The OEA consolidates all permit information at [www.michigan.gov/deqpermits](http://www.michigan.gov/deqpermits) in order to help assure that new facilities have the permits they need from the DEQ. The DEQ has a permit checklist that is sent to all facility buildings at schools or receiving funds through the Community Block and Grant Assistance Program. This information is also contained in Michigan Business Portal, with information from all of the State of Michigan’s regulatory agencies to help new businesses or municipal ventures assure that they are meeting regulatory requirements.
- **Email Distribution Lists** –You can collect many business cards when giving presentations at association- or jobber-sponsored events and meetings. Those e-mail addresses can be placed into distribution lists. As people in that industry ask questions you can send the answer via e-mail to the entire distribution list.
- **Mass Mailing Post Cards** –You can create a stir in a particular sector by sending out brightly-colored postcards informing them of a particular regulation and where they should go for more information. It is a proactive approach and can be unsettling to those facilities that like to fly below the radar.
- **Compliance Verifications** – This Program provides assurance to department that grants and incentives or awards are not provided to businesses with records of significant non-compliance.

## Incentives

- **Small Business Pollution Prevention (P2) Loan Program** – The OEA administers this loan program, which provides eligible small businesses with low-interest loans to implement P2 projects. Projects may either be identified through a waste reduction assessment under the Retired Engineers Technical Assistance Program (RETAP) or by the loan applicant. Information on the P2 Loan Program can be found at [www.michigan.gov/deqgrantsandloans](http://www.michigan.gov/deqgrantsandloans) under Pollution Prevention Grants and Loans.
- **Retired Engineer Technical Assistance Program (RETAP)** - Retired professionals are available through the RETAP to assist businesses and institutions in Michigan with P2 and energy efficiency. Businesses of 500 employees or fewer in the state and institutions of any size are eligible. The RETAP services are free of charge. Visit the RETAP Web page at [www.michigan.gov/retap](http://www.michigan.gov/retap).
- **Clean Corporate Citizen (C3) Program** - The C3 Program allows regulated establishments that have demonstrated strong environmental performance and a commitment to continual environmental improvement to be recognized as Clean Corporate Citizens. The C3s who participate in this program receive public recognition for their efforts and are eligible for benefits, including expedited permit reviews and fewer monitoring and reporting requirements. Visit [www.michigan.gov/deqc3](http://www.michigan.gov/deqc3) for more information.
- **Recycled Materials Market Directory** - The aim of the Michigan Recycled Materials Market Directory is to help Michigan businesses, communities, institutions, and organizations find markets for recyclable materials. The Directory can be accessed at [www.michigan.gov/deqrmmd](http://www.michigan.gov/deqrmmd).
- **Environmental Audit Privilege and Immunity Law** – This program is administered by OEA and provides incentives for businesses to perform environmental audits and promptly report and correct violations. Existing compliance assistance resources can be used to help a facility of any size conduct an audit and apply for immunity from civil fines and penalties. More information on this program can be found at [www.michigan.gov/envaudit](http://www.michigan.gov/envaudit).

# DEQ Guide

Michigan Department of  
Environmental Quality



STEWARDSHIP      SERVICE      PARTNERSHIP



DEQ staff achieves the department's mission by...

## Mission

To promote wise management of Michigan's air, land, and water resources to support a sustainable environment, healthy communities, and a vibrant economy.



Reviewing and processing permit applications



Monitoring resources and inspecting regulated entities



Providing pollution prevention and compliance assistance



Promoting department programs and services



Meeting with stakeholder groups to get feedback about the regulatory process

## Meet the Director

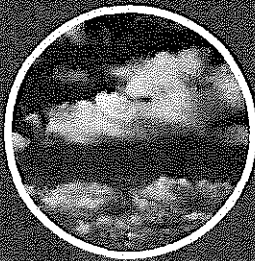


Dan Wyant

Dan Wyant currently serves as the director of the DEQ. In this role, he charges the agency to be leaders in environmental stewardship, partners in economic development, and providers of excellent customer service. He previously served as president and chief operating officer of the Edward Lowe Foundation, which promotes entrepreneurship and helps second-stage business owners accelerate growth for their companies, a position he held from 2005 to 2011. Prior to that, he served as director of the Michigan Department of Agriculture under both Governor John Engler and Governor Jennifer Granholm. Dan holds a bachelor's degree in food systems management from Michigan State University and an MBA from American University in Washington, D.C.



## Divisions and Offices



### Air Quality Division

The Air Quality Division (AQD) staff works with business, industry, air pollution sources, and with the public to maintain clean air and minimize adverse impacts on human health and the environment. Staff work to reduce existing outdoor air pollution problems and to prevent deterioration of air quality through air emission control programs, air monitoring, control strategy planning, permit issuance, and inspection of air emission sources. [www.michigan.gov/air](http://www.michigan.gov/air)



### Office of Environmental Assistance

The Office of Environmental Assistance (OEA) promotes environmental stewardship and enhances customer service across the DEQ. OEA's primary services are compliance assistance, pollution prevention, environmental education, permit coordination, financial assistance, incentive programs, training, and outreach. Additionally, the OEA manages metrics, process improvement, Freedom of Information Act requests, and professional development initiatives. [www.michigan.gov/deqpea](http://www.michigan.gov/deqpea)



Inquiries annually in the Environmental Assistance Center

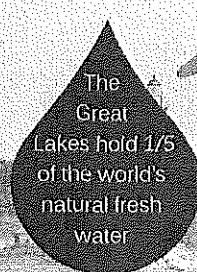


### Office of the Great Lakes

The Office of the Great Lakes (OGL) was created by the Michigan Legislature in 1985 under the Great Lakes Protection Act to lead policy development and implement programs to protect, restore, and sustain the Great Lakes ecosystem. The OGL is responsible for Michigan's Great Lakes Areas of Concern, Lakewide Action and Management Plan programs, and Michigan's Coastal Zone Management Program.

The OGL director also represents the state in a number of international and interstate organizations, including the Asian Carp Coordinating Committee, Great Lakes Commission, International Joint Commission, and Great Lakes Water Quality Agreement.

[www.michigan.gov/deqogl](http://www.michigan.gov/deqogl)



### Remediation and Redevelopment Division

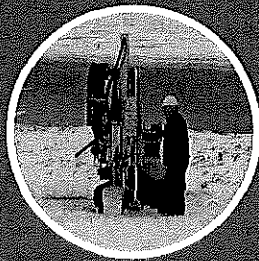
The Remediation and Redevelopment Division (RRD) administers two cleanup programs – the Environmental Remediation program and the Underground Storage Tank program – and coordinates DEQ's implementation of brownfield redevelopment financing for environmental response activities. In addition, the RRD manages portions of the federal Superfund program, established under the Comprehensive Environmental Response, Compensation, and Liability Act. These programs guide RRD's efforts in the remediation and redevelopment of contaminated properties in Michigan.

[www.michigan.gov/deqrrd](http://www.michigan.gov/deqrrd)



## Divisions and Offices

### Office of Oil, Gas, and Minerals



The Office of Oil, Gas, and Minerals (OOGM) oversees the development of fossil fuels and minerals to ensure protection of natural resources, the environment, property, and public health and safety. The OOGM regulates the locating, drilling, operating, and plugging of wells used for exploration and production of oil, gas, brine, and minerals, as well as for underground storage and waste disposal. It also regulates mines for metallic minerals and industrial sand. Additionally, the OOGM maintains a variety of maps and data on Michigan geology, fossil fuels, and minerals for industry and public use. [www.michigan.gov/deqoilgasminerals](http://www.michigan.gov/deqoilgasminerals)

### Office of Waste Management and Radiological Protection



The Office of Waste Management and Radiological Protection (OWMRP) includes the solid and hazardous waste programs as well as work related to some radioactive materials. It oversees solid waste disposal areas and county planning, the transportation and collection of scrap tires, the transportation and disposal of liquid industrial and hazardous waste, electronic waste collection and recycling, and the storage and disposal of medical waste. The office also is responsible for developing a more comprehensive strategy for residential, commercial, and industrial recycling and finding beneficial uses of waste materials. Activities in the radiological arena include coordinating with nuclear power plants, local emergency responders, and the federal government to ensure that Michigan has sufficient resources in the event of a radioactive material release. The state's radon awareness program is also managed from this office. [www.michigan.gov/deqwaste](http://www.michigan.gov/deqwaste)

### Office of Drinking Water and Municipal Assistance



The Office of Drinking Water and Municipal Assistance (ODWMA) oversees Michigan's 11,000 public water supplies to ensure safe drinking water. The office is involved in source water protection, operator certification and training, water well construction, registration of water well drilling contractors, assisting local health departments in conducting drinking water quality investigations in areas of known or suspected environmental contamination, administering drinking water replacement activities, approving and licensing the handling of domestic septage including land application and registration of haulers, and oversight of the on-site wastewater program. The office is also responsible for the design approval and licensing of campgrounds and public swimming pools. In addition, the office's revolving loan programs provide grant and loan assistance for eligible drinking water, wastewater, and water quality improvement projects. [www.michigan.gov/deqwater](http://www.michigan.gov/deqwater)

### Water Resources Division



The Water Resources Division (WRD) protects and monitors Michigan's waters by establishing water quality standards, assessing the health of aquatic communities, issuing permits to regulate wastewater discharges, and overseeing aquatic invasive species concerns and significant water withdrawals. The WRD also processes permit applications and provides technical assistance to local soil erosion and sedimentation control programs as well as activities like dredging or filling water bodies, constructing or dismantling dams, constructing marinas, seawalls, or docks; building in a designated critical sand dune, wetland, or floodplain; and protecting underwater shipwreck resources. [www.michigan.gov/wrd](http://www.michigan.gov/wrd)

**36,000** miles of  
rivers and streams  
in Michigan

**11,000** inland  
lakes

**5.5 million** acres  
of wetlands



# Strategic Goals



Protect public health



Improve the quality of air, land, and water



Increase recycling and reuse of waste



Secure long-term stable funding



Reduce untreated sewage discharges to waters of the state



Employ effective risk management and increase redevelopment at contaminated properties



Reduce uses and releases of mercury and other harmful contaminants



Reduce the introduction of aquatic invasive species into the Great Lakes

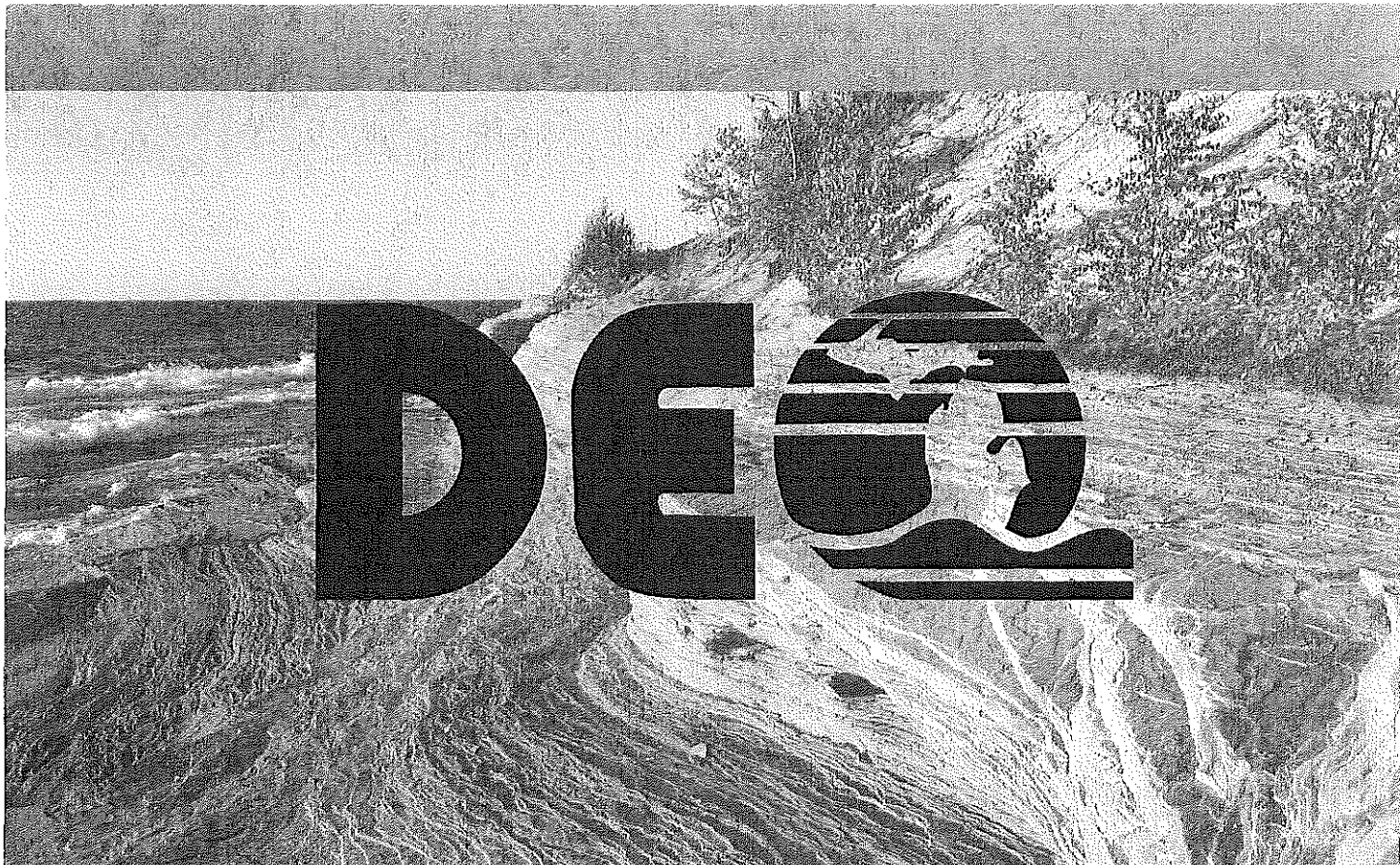


Working side by side with partners at the local, regional, and state levels, the DEQ safeguards our state's environment while supporting the economic growth and development crucial for Michigan's future.

As part of providing expert technical and pollution prevention assistance to businesses and individuals, the DEQ annually performs approximately 30,000 site visits and inspections.

The DEQ employs about 1,100 scientists, engineers, geologists, toxicologists, inspectors, technicians, managers, biologists, and support staff across the state.





Contact Us!  
[www.michigan.gov/deq](http://www.michigan.gov/deq)  
Environmental Assistance Center: 800-662-9278  
Pollution Emergencies: 800-292-4706



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DEQ updates.  
[@MichiganDEQ](https://twitter.com/MichiganDEQ)



Visit our website  
and click on the  
red envelope  
to sign up for  
email updates.





# Stay updated

on news from the  
Michigan Department of  
Environmental Quality

Sign up for our email lists to  
stay informed on important news,  
updates and events.



Follow DEQ on Twitter!  
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PARTNERSHIP

SERVICE

STEWARDSHIP



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PARTNERSHIP

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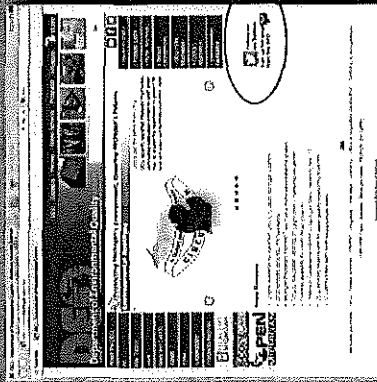
STEWARDSHIP



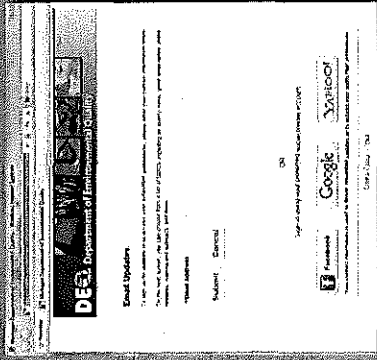
# Just follow these three simple steps...



**1** Click on the red envelope at [www.michigan.gov/deq](http://www.michigan.gov/deq)



**2** Enter your contact information.



**3** Choose the topics of interest to you and **SUBMIT**.

- ☐ Agency-wide Information
    - ☐ DEQ Environmental Calendar
    - ☐ Press Releases
  - ☐ Air Quality
    - ☐ AQ News and Info
    - ☐ Michigan Air Emissions Reporting System (MAERS)
  - ☐ Drinking Water and Municipal Assistance
    - ☐ Community Drinking Water Systems
    - ☐ Drinking Water Operator Training & Certification
    - ☐ Environmental Health Programs
    - ☐ Revolving Loan Programs
  - ☐ Environmental Assistance
    - ☐ Environmental Leaders Network
    - ☐ Green Chemistry
    - ☐ Michigan Manufacturing News
    - ☐ OEA Grant and Loan Opportunities
    - ☐ Pollution Prevention
    - ☐ Training and Outreach
  - ☐ Great Lakes
    - ☐ Great Lakes Notes
  - ☐ Pleasant Peninsulas newsletter
    - ☐ Environmental Assistance
    - ☐ Recycling and Sustainability
    - ☐ Remediation and Redevelopment
    - ☐ The AQD Voice
    - ☐ Waste Management and Radiological Protection
    - ☐ Water Words
  - ☐ Remediation and Redevelopment
    - ☐ RRD News and Info
  - ☐ Water Resources
    - ☐ Aquatic Invasive Species
    - ☐ Green Infrastructure
    - ☐ Soil Erosion & Construction Storm Water
- Change your preferences as often as you wish, and unsubscribe at any time.*

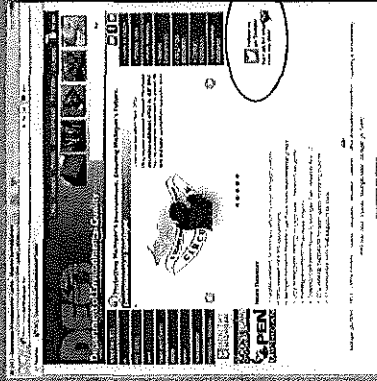
[www.michigan.gov/deq](http://www.michigan.gov/deq)

1-800-662-9278

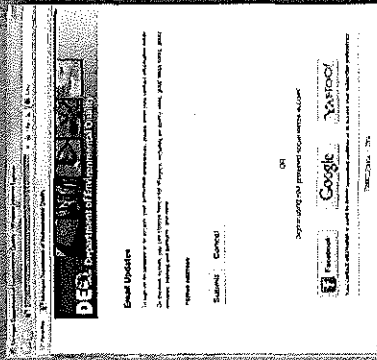
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[www.michigan.gov/deq](http://www.michigan.gov/deq)

1-800-662-9278

**Rennaker, Joanne (DEQ)**

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**From:** Adelman, Mitch (DEQ)  
**Sent:** Friday, February 13, 2015 4:15 PM  
**To:** Tommasulo, Karen (DEQ); Flechter, Matt (DEQ); DeBruler, Cari (DEQ); Pearson, Sara (DEQ); Acevedo, Jennifer (DEQ); Woods, Vence (DEQ); Wygant, Adam (DEQ); Snow, Mark (DEQ); Berman, Jonathan (DEQ); Sweet, Robert (DEQ); Casey, Steve (DEQ); Hare, Chris (DEQ); Hartz, Andrew (DEQ); Hollenbach, Heidi (DEQ); Bean, Lawrence (DEQ); Roycraft, Phil (DEQ); Sellers, Fred (DEQ)  
**Cc:** Feuerstein, Heather (DEQ)  
**Subject:** RE: Outreach team meeting notes  
**Attachments:** Great Lakes Stickers.jpg

Hi All

Sorry I had to leave the call @ 11

A few things I would have mentioned from Jackson follow:

Jackson Citizen Patriot is still interested in Industrial Steel Treatment aftermath (fine, spill prevention improvements);

RRD is working on getting access to do Statewide Expanded Triage at old leaking underground storage tank sites;

WRD, RRD, and ODWMA-RLF Section are working with Ypsilanti Community Utilities Authority (YCUA) and other stakeholders in Willow Run on plumbing upgrade issues and potential draw-down of impoundment at Tyler Pond/Tyler Dam NOAA Great Lakes Stickers;

At least 2 Jackson staff and 1 Lansing staff volunteered at great Lakes National Ocean Science Quiz Bowl at UM on 2/7/15 and this could be a good Quibicle article; and finally,

Attached are pictures of some really cool Great Lakes stickers that are about 4" x 6" from the National Oceanic and Atmospheric Administration (NOAA) Great Lakes Environmental Research Lab (GLERL) in Ann Arbor. When I visited NOAA for my Quiz Bow training, I asked for, and was provided some stickers for placement in our lobby and they're going like hotcakes.

I request that someone from either OEA or Communications office contact NOAA, GLERL in Ann Arbor to see where they get them printed, seek permission to use them and then procure a bunch of them for distribution in DEQ offices, and they'd be great swag for Earth Day.

Speaking of Earth Day, we are also seeing a volunteer within the District to coordinate our booth at the April 25 Jackson Area Outdoor Coalition Earth Day event, as Deb Snell from WRD will not be doing it for us again this year, and will keep this group posted as progress there.

Thanks

Mitch

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**From:** Tommasulo, Karen (DEQ)  
**Sent:** Friday, February 13, 2015 3:01 PM  
**To:** Flechter, Matt (DEQ); DeBruler, Cari (DEQ); Pearson, Sara (DEQ); Acevedo, Jennifer (DEQ); Woods, Vence (DEQ); Wygant, Adam (DEQ); Snow, Mark (DEQ); Berman, Jonathan (DEQ); Sweet, Robert (DEQ); Adelman, Mitch (DEQ); Casey, Steve (DEQ); Hare, Chris (DEQ); Hartz, Andrew (DEQ); Hollenbach, Heidi (DEQ); Bean, Lawrence (DEQ); Roycraft, Phil (DEQ); Sellers, Fred (DEQ)  
**Cc:** Feuerstein, Heather (DEQ)  
**Subject:** Outreach team meeting notes

Here's notes from yesterday's outreach meeting. Please let me know if I missed anything important.

Thanks all! See you next month. Feel free to let me know if something comes up in the meantime.

Karen Tommasulo  
Public Information Officer  
Michigan Department of Environmental Quality  
517-284-6716 | 517-599-5733  
[tommasulok@michigan.gov](mailto:tommasulok@michigan.gov)







**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, January 20, 2015 3:12 PM  
**To:** Sygo, Jim (DEQ); Datema, Maggie (DEQ); Howes, Sarah (DEQ)  
**Cc:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Subject:** FW: Public Forum  
**Attachments:** Public Water Presentation 1.21.2015.pdf; Addressing Flint's Water Concerns.pdf

Attached is information regarding the public meeting in Flint tomorrow night (Wed. 1/21) regarding the City's drinking water violation.

Mike Prysby and I will be participating in a panel to answer questions. Brad has planned to attend to help address the media.

In addition to the media, local members of the Michigan Legislature are also planning to attend or have staff attend.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Howard Croft [<mailto:hcroft@cityofflint.com>]  
**Sent:** Friday, January 16, 2015 5:03 PM  
**To:** [jjmananich@house.mi.gov](mailto:jjmananich@house.mi.gov); [repphelps@house.mi.gov](mailto:repphelps@house.mi.gov); Sheldon Neeley; Hovey, Amy  
**Cc:** Tom Lenard; Bryanna McGarry; Sean Walser; Dickinson, Jordan; Flint Mayor; Prysby, Mike (DEQ); Busch, Stephen (DEQ); John O'Brien; [djansen@gcdcwws.com](mailto:djansen@gcdcwws.com); Green, Warren; Matta, Samir; Elizabeth Murphy; Gerald Ambrose; Brian Larkin  
**Subject:** Public Forum

All,

The City of Flint is hosting a public forum next Wednesday January 21st in the dome at City Hall at 7:00 pm. The focus will be a presentation followed by a question and answer session about water. The panel will consist of two of our DEQ representatives, the lead engineer from LAN, the Genesee County Drain Commissioner Jeff Wright, and myself.

Please feel free to attend or recommend your constituency to attend, I am forwarding a copy of the press release along with our most recent communication's about the City of Flint water system.

I am looking to build a better communication network for sending out information from the City of Flint DPW Department to interested parties on a more frequent basis. I will inform everyone when that is formally established.

Please call me if you have any questions,

Thank you,

--

**Howard Croft**  
Public Works Director  
City of Flint  
1101 S. Saginaw Street  
Flint, MI 48502  
PH# 810.766.7346 Ext.2043  
[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)

**Gerald Ambrose**  
Emergency Manager



**Dayne Walling**  
Mayor

**Jason Lorenz**  
Public Information Officer  
(810) 237-2039  
jlorenz@cityofflint.com

**For Immediate Release**

**City of Flint Will Hold Public Water Presentation Wednesday, January 21, 2015 at 7:00pm in the City Hall Dome**

*Flint, Michigan – January 16, 2015* — The City of Flint will be hosting a water presentation on Wednesday, January 21, 2015 at 7pm. That presentation will be held in the City Hall Dome and will feature information detailing water treatment, water distribution and the steps being taken to ensure that citizens get water that meets all regulatory safety and quality standards. "We want the residents, businesses and visitors of Flint to know that the water in Flint is safe and that we are working every day to make improvements to our system to ensure that," said City DPW Director Howard Croft. "Our goal is make sure we get people the information on our efforts and assure them that we are on the right track with them."

DPW Director Croft and Utilities Administrator Daugherty Johnson will be joined on a panel by representatives from the Genesee County Drain Commissioner's office, the Michigan Department of Environmental Quality and LAN engineering. Written questions from the audience will be collected during the presentation and answered by the panel after the presentation.

—END—

## Addressing Flint's Water Concerns

Recent events have raised concerns among many as to the safety and quality of the water provided by the City's utility system. The City is and continues to be committed to assuring that residents and visitors know that the water is safe and that those responsible for providing water are working every day to improve the quality of the water. The quality of the water does need improvement, but that is not to be confused with safety of the water. The recent notice by MDEQ clearly stated that the water provided by the utility system is safe to drink, but cautioned that some vulnerable groups may want to consult with their health care provider if they have concerns. The City remains committed to their efforts to assure that the water is safe for everyone and that quality is both improved and improving.

To date, the City has taken the following actions:

- As an integral part of the transition to the Flint River on a temporary basis, the MDEQ was consulted about the City's plans, and ultimately issued necessary permits to proceed. The City also engaged the services of the LAN engineering firm to guide the city in installing the necessary equipment to treat the water on an ongoing basis. This resulted in the development of a comprehensive drinking water plan.
- The City monitors its water quality on a daily basis to assure that water quality remains within established guidelines. With the variances in water temperature and the leakage and infiltration problems arising as the result of failure of parts of the distribution system, water quality did exceed, for a time, some of the established guidelines. This resulted in the issuance of the recent notices to the public. Upon receipt of information that some guidelines were exceeded, the City's priority focus was to bring water quality back within guidelines. Efforts taken to address non-compliance included increasing water flow through valve replacements and hydrant flushing and optimizing treatment processes.
- The City has committed to increasing communication with the public in order to inform water users factually of the issues which have arisen, to alleviate unnecessary concern and to identify the steps being taken to address the issues. This is being implemented through detailed and easy to understand educational materials being made available both online and at City Hall, as well as through ongoing public informational meetings.
- Most recently, in light of recent concerns raised by resident groups over the quality and safety of water, Department of Public Works Director Howard Croft and his staff collected questions from citizens during a recent public meeting. After reviewing these questions, DPW Director Croft and his staff set out to answer them in concise detail; the result of that work is a full Water System Questions and Answers document is available online. Along with the detailed information within, the document also contains links to other source documents and regulatory statutes found online which were used as reference. **"We want the residents, businesses and visitors of Flint to know that the water in Flint is safe**

and that we are working every day to make improvements to our system to ensure that," said Croft. "Our goal is make sure we get people the information on our efforts and assure them that we are on the right track with them." More documentation, including regular water quality monitoring reports, will be made available.

- Additionally, a number of public meetings have and will continue to take place. Two of the most recent of these took place at the Antioch Baptist Church and the Mott Community College Regional Technology Center. These meetings were held by concerned neighborhood groups and were attended by Mayor Walling and DPW Director Croft. At both meetings, citizens voiced their concerns and asked questions about water quality and the recent violation notice. Director Croft offered detailed answers to common questions, but also offered to investigate specific water issues raised by residents in which the City could offer assistance. Those in attendance came away with a better understanding of the issues surrounding the drinking water in their community.
- The City of Flint will be hosting a water presentation on **Wednesday, January 21, 2015 at 7pm. That presentation will be held in the City Hall Dome** and will feature information detailing water treatment, water distribution and the steps being taken to ensure that citizens get water that meets all regulatory safety and quality standards. City DPW Director Howard Croft and Daugherty Johnson, Utilities Administrator, will be joined on a panel by representatives from the Genesee County Drain Commissioner's office, the Michigan Department of Environmental Quality and LAN engineering. Written questions from the audience will be collected during the presentation and answered by the panel after the presentation.
- The City of Flint has also determined that in light of the serious concerns raised, it will secure the services of an external firm with expertise in managing drinking water quality to assess the steps that the city has taken, to make recommendations as to other steps to be taken, to oversee their implementation, and to monitor operations until the City's water source becomes the KWA. A Request for Proposal was issued on January 15, 2015, with proposals due back on January 26.

#### **The DWSD Question:**

As a result of the concerns raised, several community members have suggested that the City reconnect to the Detroit Water and Sewer Department (DWSD). DWSD has advised that they would be willing to allow such a reconnection without a hook-up fee. However, the City would be obligated to pay a fixed monthly charge of \$846,700 plus the \$14.92/Mcf cost of water itself and agree to a long term arrangement. The City's analysis of the DWSD proposal concludes that the City's cost would increase by more than \$12 million per year at the proposed rates, and could increase even more as proposed rates are subject to change after July 1, 2015. This increase in costs would not be in the best interests of the City or its water users, as the City is committed to assuring safety and improving water quality by following its current plan, and reconnecting to DWSD would likely require deferment of existing capital improvements or an additional increase in rates.

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, September 22, 2015 12:04 PM  
**To:** Richard Benzie P.E. (BENZIER@michigan.gov); cookp@michigan.gov  
**Subject:** FW: question about optimal WQP ranges for Flint's water  
**Attachments:** DWSD Water Quality Parameters.pdf

I would appreciate some assistance in responding to this request. I only have the attached letter Kris provided regarding DWSD WQP plant tap ranges. We wouldn't establish ranges for the Flint WTP until after optimized CCT has been installed.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

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**From:** Yanna Lambrinidou [<mailto:pnalternatives@yahoo.com>]  
**Sent:** Wednesday, September 16, 2015 7:22 PM  
**To:** Busch, Stephen (DEQ); Wurfel, Brad (DEQ)  
**Subject:** Re: question about optimal WQP ranges for Flint's water

Dear Mr. Busch,

Thank you for your quick response. I appreciate the information at, I am sure, a very busy time for you and MDEQ.

Could you please help me understand the following?

When you say that all previous optimal water quality parameter ranges would have been established for the Detroit water utility (not for the City of Flint), do you mean that MDEQ never set optimal water quality parameter ranges *specifically* for Flint before Flint's switch to Flint River water?

It is my impression, please correct me if I'm wrong, that under the LCR, all large systems -- whether they are consecutive or not -- must have optimal water quality parameter ranges designated by states *specifically for them* (at the time when these systems are deemed to have optimized their treatment). Is there language in the LCR I am missing that allows a utility not to have optimal quality parameter ranges established specifically for it?

My second question is this: If the City of Flint had no optimal water quality parameter ranges established specifically for it in the past, how did it achieve LCR compliance? Isn't it the case that utility-specific optimal water quality parameter ranges (and maintenance of these ranges) are required for all large systems to avoid an LCR violation?

I would appreciate your assistance on this matter, as it will shed light on an issue that seems to be very important for EPA's assessment of and upcoming revisions to the LCR.

Kindly,

Yanna Lambrinidou

Yanna Lambrinidou PhD  
 Parents for Nontoxic Alternatives  
 PO Box 6283  
 Washington DC 20015

P 202.997.1834

B [www.dcdwasawatch.blogspot.com](http://www.dcdwasawatch.blogspot.com)

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**From:** "Busch, Stephen (DEQ)" <[BUSCHS@michigan.gov](mailto:BUSCHS@michigan.gov)>  
**To:** Yanna Lambrinidou <[pnalternatives@yahoo.com](mailto:pnalternatives@yahoo.com)>; "Wurfel, Brad (DEQ)" <[WurfelB@michigan.gov](mailto:WurfelB@michigan.gov)>  
**Sent:** Monday, September 14, 2015 11:05 AM  
**Subject:** RE: question about optimal WQP ranges for Flint's water

Dr. Lambrinidou,

All previous water quality parameter ranges would have been established for the City of Flint's wholesale finished water supplier, the Detroit Water and Sewerage Department, not the City of Flint itself.

As the City of Flint has not yet established optimized corrosion control treatment, the MDEQ is not yet at the point of regulatory requirements where the range of water quality parameters would be set.

Stephen Busch, P.E.  
MDEQ Lansing District Coordinator  
Office of Drinking Water and Municipal Assistance  
Lansing and Jackson District Supervisor  
517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

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**From:** Yanna Lambrinidou [<mailto:pnalternatives@yahoo.com>]  
**Sent:** Thursday, September 10, 2015 11:11 AM  
**To:** Wurfel, Brad (DEQ); Busch, Stephen (DEQ)  
**Subject:** question about optimal WQP ranges for Flint's water

Good morning Mr. Wurfel and Mr. Busch,

As a member of the EPA National Drinking Water Advisory Council (NDWAC) Lead and Copper Rule (LCR) workgroup that just completed its recommendations to EPA about the agency's upcoming revisions to the LCR, I am watching with great interest and concern the developments in Flint in relation to lead. I am looking for information on the optimal water quality parameter (WQP) ranges that MDEQ has set for Flint's water. Are those posted online? If so, could you send me the link? If not, could you let me know what they are?

Thank you kindly,

Yanna Lambrinidou PhD  
Parents for Nontoxic Alternatives  
PO Box 6283  
Washington DC 20015  
P 202.997.1834  
B [www.dcdwasawatch.blogspot.com](http://www.dcdwasawatch.blogspot.com)

001 05:43 FAX 313 267 3634

WATER QUALITY

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STATE OF MICHIGAN



JOHN ENGLER, Governor

## DEPARTMENT OF ENVIRONMENTAL QUALITY

*"Better Service for a Better Environment"*

HOLLISTER BUILDING PO BOX 30473 LANSING MI 48909-7973

INTERNET: [www.deq.state.mi.us](http://www.deq.state.mi.us)

RUSSELL J. HARDING, Director

## REPLY TO:

DRINKING WATER & RADIOLOGICAL  
PROTECTION DIVISION  
SOUTHEAST MICHIGAN DISTRICT OFFICE  
36980 SEVEN MILE ROAD  
LIVONIA, MICHIGAN 48152-1005

March 3, 2000

Mr. Robert Malloch, Water Production Manager  
City of Detroit  
Water and Sewerage Department  
735 Randolph Street  
Detroit, Michigan 48826-2830

WSSN: 1880

Dear Mr. Malloch:

SUBJECT: Water Supply - Detroit Water and Sewerage Department (DWSD)  
Lead and Copper Water Quality Parameter Limits

This letter is intended to correct errors contained in a previous letter, dated September 27, 1999, acknowledging lead and copper results and establishing water quality parameters.

Results of the January through June 1999, follow-up monitoring required by the Lead and Copper Rule have been mailed separately to Ms. Pamela Turner of DWSD. The 90<sup>th</sup> percentile action levels for lead and copper are 15 ug/l and 1300 ug/l, respectively. Based on the 104 samples collected, the 90<sup>th</sup> percentile results for the city of Detroit were 6 ug/l for lead and 47 ug/l for copper. Therefore, the city has met both action levels and public education is not required. In addition, we have received satisfactory results of the water quality parameter monitoring from the distribution tap samples and from the point of entry samples collected at the five (DWSD) owned water treatment plants.

DWSD has demonstrated optimum corrosion control using phosphoric acid. The state must determine water quality parameters that must be maintained to ensure that optimum corrosion control will continue. Based on our review of monthly operation reports and numerous discussions, we have agreed on limits for pH, phosphoric acid dosage and residual, measured at the water treatment plant taps.



Mr. Robert Malloch

Page 2

March 3, 2000

~~A minimum pH of 7.0 must be maintained at the treatment plant tap with no more than 9 days per six-month period (Jan. through June, July through Dec.) in non-compliance with this established minimum. If more than one pH sample is collected in a day, the results will be a weighted average for the day.~~

In addition to pH, a lower limit must be maintained for the phosphoric acid dosage and measured residual at the treatment plant taps. Again, based on our review of monthly operation reports and discussions with you, we have agreed on a minimum dosage and residual for phosphoric acid.

~~A minimum total phosphate dosage of 0.9 mg/l must be maintained at each of the five water treatment plant taps on a daily basis. In addition, a total phosphate residual of 0.8 mg/l must be maintained at each of the water treatment plant taps. If more than one phosphate sample is collected in a day, the results will be a weighted average for the day. Again, no more than 9 days in a six-month period can be in non-compliance with these established limits.~~

In addition to water treatment plant tap sampling, water quality parameters from the distribution system will continue to be required every six month period (Jan. - June, July - Dec.). Two samples per six-month period are required from each site and the parameters to be analyzed include pH, total phosphate and alkalinity. The numbers of sites to be sampled are reduced from previous monitoring periods.

#### Water Quality Parameter Monitoring

| <u>Service Area</u> | <u>Previous # WQP Sites</u> | <u>New # WQP Sites</u> |
|---------------------|-----------------------------|------------------------|
| Detroit             | 25                          | 10                     |
| Detroit Suburbs     | 140                         | 70                     |
| SOCWA               | 25                          | 10                     |
| Flint               | 8                           | 8                      |
| Genesee County      | 6                           | 6                      |

01/25/2001 05:43 FAX 313 267 3634

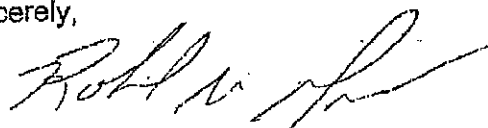
WATER QUALITY

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Mr. Robert Malloch  
Page 3  
March 3, 2000

Should you require additional details or further explanation of any of this information, please feel free to contact me.

Sincerely,



Robert A. Green, P.E., Supervisor  
Field Operations Section  
Drinking Water and Radiological  
Protection Division  
734-953-1439

RAG:

cc: Ms. Pamela Turner, DWSD  
Tucker, Young, Jackson and Tull, Inc.  
Wayne County Health Department

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, March 25, 2014 12:40 PM  
**To:** Wurfel, Brad (DEQ)  
**Subject:** FW: questions about Flint River

FYI.

I'll let you know what he wants when I call him back.

Also, my voicemail works fine, got a message this morning and tried it again just now, so not if he's calling the wrong number or just fibbing.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Adams, Dominic [<mailto:DADAMS5@mlive.com>]  
**Sent:** Tuesday, March 25, 2014 12:20 PM  
**To:** Busch, Stephen (DEQ)  
**Subject:** questions about Flint River

Steve:

My name is Dominic Adams and I am a reporter with The Flint Journal. We spoke in July about the city using the Flint River as a primary drinking water source until the Karegnondi Water Authority is complete. Here is a link to that story: [http://www.mlive.com/news/flint/index.ssf/2013/07/flint\\_to\\_spend\\_171000\\_for\\_engi.html](http://www.mlive.com/news/flint/index.ssf/2013/07/flint_to_spend_171000_for_engi.html)

The city says it is going to start using the Flint River and cut off from Detroit by April 17. I'd like to speak to you about the technical aspect about what that means. I tried leaving you a voicemail, but it says your voicemail is full.

Please give me a call at 810-241-8803 as soon as possible so we can discuss this.

If you are not the person I need to speak to about this, please give the name and contact information for the person I should talk to.

Thanks a lot and have a great day.

Dominic Adams | metro reporter | [The Flint Journal](#) | 810-241-8803 | [dadams5@mlive.com](mailto:dadams5@mlive.com) |  
[On Twitter](#) | [On Facebook](#) |

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, April 15, 2015 1:25 PM  
**To:** Thelen, Mary Beth (DEQ) (THELENM2@michigan.gov); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Cc:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: R5 Regional Administrator to visit Flint area this Friday  
  
**Importance:** High

Mary Beth and Brad,

Please see the note below. I assume but wasn't sure who from the executive office will be participating in this visit by EPA to Flint, but as noted drinking water is likely to come up and while the Administrator has been briefed by regional EPA staff they likely don't have all the details that we do.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Crooks, Jennifer [<mailto:crooks.jennifer@epa.gov>]  
**Sent:** Wednesday, April 15, 2015 1:10 PM  
**To:** Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Philip, Kris (DEQ); Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Cc:** Poy, Thomas; Kuefler, Janet  
**Subject:** R5 Regional Administrator to visit Flint area this Friday

Our Regional Administrator, Susan Hedman, will be traveling to Flint this Friday to discuss Brownfields. Of course, we think the discussion will more likely be about the drinking water. Tom Poy and I briefed the RA yesterday on the pertinent issues. I will forward the briefing when it is final. Please don't hesitate to contact Tom Poy (312-886-5991; [poy.thomas@epa.gov](mailto:poy.thomas@epa.gov)) or myself if you have questions.

Jennifer  
 (312.886.0244)

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, November 18, 2014 3:05 PM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'  
**Subject:** FW: Re: Flint

FYI. Looks like we probably won't have results back until after Turkey Day.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

**From:** Michael Glasgow [<mailto:mglasgow@cityofflint.com>]  
**Sent:** Tuesday, November 18, 2014 2:54 PM  
**To:** Rosenthal, Adam (DEQ)  
**Cc:** Brent Wright; Busch, Stephen (DEQ); Prysby, Mike (DEQ)  
**Subject:** Re:

Adam,

We were planning on sampling DBP's tomorrow &/or Thursday, following the schedule that was set up during Stage 2 DBP implementation (3rd full week of November), and samples will be mailed out Thursday. I would expect the lab to receive samples on Friday the 21st. With the Holiday next week, I don't expect results until after the first of December.

Mike Glasgow  
 City of Flint Water Plant

On Tue, Nov 18, 2014 at 2:33 PM, Rosenthal, Adam (DEQ) <[ROSENTHALA@michigan.gov](mailto:ROSENTHALA@michigan.gov)> wrote:

Brent & Mike, we need to find out if you have collected the 4<sup>th</sup> quarter DBPs (TTHM & HAA5), or when you plan on collecting the samples, and when to expect results. Please let us know.

thanks,

Adam Rosenthal, EQA

MDEQ – Office of Drinking Water and Municipal Assistance

Lansing District – Constitution Hall 1SW

PO Box 30242

Lansing, MI 48909

517-284-6644

fax: 517-241-3571

**Rennaker, Joanne (DEQ)**

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**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, March 17, 2015 12:21 PM  
**To:** Adam Rosenthal (rosenthala@michigan.gov)  
**Subject:** FW: SDWA Violations - Flint

**Importance:** High

As I indicated the info you provided was transmitted to the Governor's office. Excellent work in a short time frame. Well done!

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Thelen, Mary Beth (DEQ)  
**Sent:** Tuesday, March 17, 2015 11:39 AM  
**To:** Hollins, Harvey (GOV); Clayton, Stacie (GOV)  
**Cc:** Wyant, Dan (DEQ); Wurfel, Brad (DEQ); Sygo, Jim (DEQ); Thelen, Mary Beth (DEQ)  
**Subject:** SDWA Violations - Flint  
**Importance:** High

Dear Harvey,

Director Dan Wyant asked that I send you the following information regarding Flint.

As requested, the following information has been gleaned from our database regarding violations:

In calendar years 2013 and 2014, we've identified 1100 violations (200 are standards violations, i.e., MCLs; and 910 other violations).

This represents 326 community water supplies that had violations over these two years.

Flint has 5 violations in those 2 years (TTHM MCLs at 2 sites and 2 bacti MCLs (1 with E. coli that counts as an additional violation)).

Please let us know if you need anything further. Thank you.

Mary Beth

Mary Beth Thelen  
 Management Assistant to Director Dan Wyant  
 Department of Environmental Quality  
 Constitution Hall, 6th Floor South  
 Phone: 517-284-6712 or 284-6700 (new numbers)  
 Fax: 517-241-7401  
[Thelenm2@michigan.gov](mailto:Thelenm2@michigan.gov)





**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, April 08, 2015 2:29 PM  
**To:** prysbym@michigan.gov  
**Subject:** FW: SMT Paragraphs for April 6 meeting

FYI.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, April 06, 2015 4:31 PM  
**To:** Shekter Smith, Liane (DEQ)  
**Cc:** Richard Benzie P.E. ([BENZIER@michigan.gov](mailto:BENZIER@michigan.gov))  
**Subject:** RE: SMT Paragraphs for April 6 meeting

I think your note should cover it at this point.

Here is some other info FYI.

- No movement from DCH/GCHD on Legionella to my knowledge
- The EM transition is anticipated to begin this month.
- The WTP is having issues with plant tap Bromate levels. The RAA won't be calculated until end of June, but the average to this point is hovering just above the MCL of 10 ppb.
- Mike just issued a construction permit for a replacement of 8400 feet of 24 inch transmission main (a multi-million dollar project) that should help with some distribution issues.
- The City's consultant is also preparing a construction permit application to revamp WTP filters with GAC.
- The PN for TTHM MCL violation went out last week, so we may see more calls, next samples are in May.
- The resident with high lead levels was found to have a lead service line connected to an older parallel main. The service line has been completely replaced.
- The City has been given info to prepare an LT2 sampling plan, due 7/1 with monitoring to start 10/1.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

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**From:** Shekter Smith, Liane (DEQ)  
**Sent:** Monday, April 06, 2015 3:59 PM  
**To:** Benzie, Richard (DEQ); Busch, Stephen (DEQ); Butler, Sonya (DEQ); Crooks, Jennifer ([crooks.jennifer@epa.gov](mailto:crooks.jennifer@epa.gov)); Green, Kelly (DEQ)  
**Cc:** Devereaux, Tracy Jo (DEQ)  
**Subject:** RE: SMT Paragraphs for April 6 meeting

There were a number of questions this morning during our SMT meeting about what is new in Flint. I'm proposing to include the following paragraph in the SMT summary. Please let me know if you have concerns or think we need to add additional information.

ODWMA shared that we are still working with and following the situation in the city of Flint. It was reported that the city council voted to return to water supplied by DWSD. However, the emergency manager and the mayor indicated that they will be continuing to use the Flint River. DEQ staff continues to provide oversight to ensure that water provided by the city of Flint meets drinking water standards. As a result of elevated trihalomethane (TTHM) levels last summer, the city continues to exceed the locational running annual average for TTHMs at one sampling site. However, all samples this quarter were low. It appears that operational changes implemented by the plant are managing previous water quality concerns. On another note, the city has requested U.S. EPA provide principal forgiveness for past low-interest SRF (State Revolving Fund) loans and DWRF (Drinking Water Revolving Fund) loans. We are awaiting an official response from EPA.

Liane

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**From:** Thelen, Mary Beth (DEQ)  
**Sent:** Monday, April 06, 2015 10:56 AM  
**To:** DEQ-EXE-MGMT-TEAM; DEQ-District-Coordinators  
**Cc:** DEQ-EXE-MGMT-TEAM-Secretaries  
**Subject:** SMT Paragraphs for April 6 meeting  
**Importance:** High

Please send your SMT paragraph(s) to Carrie Barr and me by Tuesday noon of this week. If you didn't have anything to report but would like to include something, please feel free to send it to us.

Thank you.

Mary Beth

Mary Beth Thelen  
Management Assistant to Director Dan Wyant  
Department of Environmental Quality  
Constitution Hall, 6th Floor South  
Phone: 517-284-6712 or 284-6700 (new numbers)  
Fax: 517-241-7401  
[Thelenm2@michigan.gov](mailto:Thelenm2@michigan.gov)

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 07, 2015 12:04 PM  
**To:** Adam Rosenthal (rosenthala@michigan.gov); prysbym@michigan.gov; 'Rennaker, Joanne (DEQ) (RENNAKERJ@michigan.gov)'  
**Subject:** FW: Tally of Flint calls  
**Attachments:** Calls from Public list.doc

Sorry, I meant to cc you on this.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 07, 2015 11:43 AM  
**To:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Tally of Flint calls

FYI. I had Mike put together a list of those who have contacted us and we have responded to regarding the Flint TTHM violation, I have added those Adam and I spoke with too. If you or your staff receive calls this should help to note whether the individual has already been in contact with staff, so share with your staff as appropriate. Hopefully, it will help avoid any mixed messages and can shorten the conversations to any additional concerns or questions the individual may have.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

---

**From:** Prysby, Mike (DEQ)  
**Sent:** Wednesday, January 07, 2015 11:30 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** Tally of Flint calls

Steve,

Attached is a list of the calls from the public that I have taken to avoid duplication of efforts. I will update the list and re-send to you following each additional call received.

Michael Prysby, P.E.  
 District Engineer  
 Office of Drinking Water and Municipal Assistance  
 517 290-8817

**Flint TTHM Violation  
Completed Calls from the Public  
MFP**

- 1/5: Mike P.-Ron Fonger – Flint Journal – Media inquiry
- 1/5: Mike P. - Lawrence Reynolds – Mott Children's Health
- 1/5: Mike P. - Walter Smith-Randolph – NBC 25 Flint News – Recorded interview
- 1/5: Adam R. – Denise – Flint Resident
  
- 1/6: Mike P. - Arthur Woodston – resident – general questions, invite to res. Mtg
- 1/6: Mike P. - Bradley - resident – ok to boil water for baby formula bottle?
- 1/6: Mike P. - Raimy Elley – resident – gen info., most upset on city's delay to notify
- 1/6: Mike P. - Reps. Sheldon Neeley and Phil Phelps – update State Reps for Flint Districts on TTHM issue. Richard Benzie and Sarah Howes participated.
- 1/6: Steve B. – Cheryl Wormsman – friend of Flint resident- general questions/concerns
  
- 1/7:

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, January 07, 2015 11:43 AM  
**To:** Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov); Richard Benzie P.E. (BENZIER@michigan.gov)  
**Subject:** FW: Tally of Flint calls  
**Attachments:** Calls from Public list.doc

FYI. I had Mike put together a list of those who have contacted us and we have responded to regarding the Flint TTHM violation, I have added those Adam and I spoke with too. If you or your staff receive calls this should help to note whether the individual has already been in contact with staff, so share with your staff as appropriate. Hopefully, it will help avoid any mixed messages and can shorten the conversations to any additional concerns or questions the individual may have.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

---

**From:** Prysby, Mike (DEQ)  
**Sent:** Wednesday, January 07, 2015 11:30 AM  
**To:** Busch, Stephen (DEQ)  
**Subject:** Tally of Flint calls

Steve,

Attached is a list of the calls from the public that I have taken to avoid duplication of efforts. I will update the list and re-send to you following each additional call received.

Michael Prysby, P.E.  
District Engineer  
Office of Drinking Water and Municipal Assistance  
517 290-8817

**Flint TTHM Violation  
Completed Calls from the Public  
MFP**

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1/5: Mike P. - Walter Smith-Randolph – NBC 25 Flint News – Recorded interview  
1/5: Adam R. – Denise – Flint Resident
- 1/6: Mike P. - Arthur Woodston – resident – general questions, invite to res. Mtg  
1/6: Mike P. - Bradley - resident – ok to boil water for baby formula bottle?  
1/6: Mike P. - Rainy Elley – resident – gen info., most upset on city’s delay to notify  
1/6: Mike P. - Reps. Sheldon Neeley and Phil Phelps – update State Reps for Flint  
Districts on TTHM issue. Richard Benzie and Sarah Howes participated.  
1/6: Steve B. – Cheryl Wormsman – friend of Flint resident- general questions/concerns
- 1/7:

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Wednesday, September 30, 2015 1:14 PM  
**To:** Pallone, Maggie (DEQ); 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Wyant, Dan (DEQ)  
**Subject:** FW: Technical Advisory Meeting

FYI.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

**From:** Howard Croft [<mailto:hcroft@cityofflint.com>]  
**Sent:** Wednesday, September 30, 2015 1:01 PM  
**To:** Brent Wright; Dayne Walling; donna. cole; edwardsm; Gerald (Jed) Natzke; Howard Croft; James Henry; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; [larry.koehler@mcc.edu](mailto:larry.koehler@mcc.edu); Laura Sullivan; Michael Glasgow; Michael Wright; Mike Lane; Prysby, Mike (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; [rosejo@msu.edu](mailto:rosejo@msu.edu); Russell Hudson; Samir Matta; [schock.michael@epa.gov](mailto:schock.michael@epa.gov); Sean Kammer; Warren Green; Busch, Stephen (DEQ); [lytle.darren@epa.gov](mailto:lytle.darren@epa.gov); Amy Hovey; Andy Leavitt; James Gaskin  
**Subject:** Re: Technical Advisory Meeting

Team,

I am writing to again confirm our meeting which is scheduled for next Wednesday October 7th at 2:00 pm. We have decided to hold the meeting at City Hall but due to rapidly evolving events I will wait until early next week to put out an agenda. In general, we expect to update the most recent water status in order to get everyone on the same page, and then have a targeted agenda that points at both a short term and long term goals.

In staying consistent with our other meetings we anticipate a full sharing of information along with open discussion and a clear direction going forward. Darren Lytle of the EPA has committed to being at the meeting and Marc Edwards of Virginia Tech has agreed to call in.

Please email me if there are any questions.

Thank you,

On Wed, Sep 23, 2015 at 3:52 PM, Howard Croft <[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)> wrote:

Technical Advisory Team,

I am writing to inform everyone that we have scheduled the next Technical Advisory Committee meeting to be Wednesday October 7<sup>th</sup>, 2015 from 2:00 – 4:30 pm. We are extending invitations to Marc Edwards of Virginia

Tech along with two lead experts from the EPA (Darren Lytle & Michael Schock) to become a part of the technical team and we are hopeful that they will all be present at the upcoming meeting.

At the meeting we will discuss an overview of the City water system, compliance with the Safe Drinking Water Act, lead concerns, corrosion control, water testing, public education, capital improvement plans, the KWA pipeline, and next steps.

I will forward a specific location and agenda in the near future but we are firmly committing to the time and date. As with previous meetings we look forward to this group having positive dialogue that will benefit the community.

Thank you,

--

**Howard Croft**

Public Works Director  
City of Flint  
1101 S. Saginaw Street  
Flint, MI 48502  
PH# 810.766.7135 Ext.2043  
[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)

--

**Howard Croft**

Public Works Director  
City of Flint  
1101 S. Saginaw Street  
Flint, MI 48502  
PH# 810.766.7135 Ext.2043  
[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)



**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Friday, September 25, 2015 12:45 PM  
**To:** 'Wurfel, Brad (DEQ) (WurfelB@michigan.gov)'; Richard Benzie P.E. (BENZIER@michigan.gov); Shekter Smith, Liane (DEQ) (SHEKTERL@michigan.gov)  
**Subject:** FW: Technical Advisory Meeting  
**Attachments:** GCHD Lead in Water Fact Sheet.pdf; Information Plan.pdf; Lead Advisory Release.pdf

FYI.

Stephen Busch, P.E.  
 MDEQ Lansing District Coordinator  
 Office of Drinking Water and Municipal Assistance  
 Lansing and Jackson District Supervisor  
 517-643-2314  
[buschs@michigan.gov](mailto:buschs@michigan.gov)

**From:** Howard Croft [<mailto:hcroft@cityofflint.com>]  
**Sent:** Friday, September 25, 2015 12:42 PM  
**To:** Brent Wright; Dayne Walling; donna. cole; edwardsm; Gerald (Jed) Natzke; Howard Croft; James Henry; Jason Lorenz; jmikewright; JoAnne Herman; John O'Brien; Kirk Smith; [larry.koehler@mcc.edu](mailto:larry.koehler@mcc.edu); Laura Sullivan; Michael Glasgow; Michael Wright; Mike Lane; Prysby, Mike (DEQ); Natasha Henderson; Norb Birchmeier; Pete Levine; Robert Bincsik; [rosejo@msu.edu](mailto:rosejo@msu.edu); Russell Hudson; Samir Matta; [schock.michael@epa.gov](mailto:schock.michael@epa.gov); Sean Kammer; Warren Green; Busch, Stephen (DEQ); [lytle.darren@epa.gov](mailto:lytle.darren@epa.gov); James Gaskin; Amy Hovey; Andy Leavitt  
**Subject:** Re: Technical Advisory Meeting

Technical Advisory Team,

Today the City of Flint along side of the Genesee County Health Department issued a lead advisory at a well attended press conference. The press conference lasted over an hour and a half with both the Health Department and the City answering numerous questions. I have included the documents that were released at the news conference and will continue to provide everyone with additional information as it becomes available. We will be coordinating closely with the health department to provide consistent information to the public and intend to increase our awareness campaign.

There is growing anticipation of our next Technical Advisory Meeting on October 7th and we are working to determine the best possible venue based on the attention that we expect. Jamie Gaskin, the United Way CEO has joined the team and I have also included Andy Leavitt of State Senator Ananich's office along with Amy Hovey from U.S. Congressman Kildee's team. We are developing a quarterly mailer that we will distribute to all water customers that will look a lot like our annual consumer confidence report and we intend to have input from the TAC team meeting to be included in the report. The mailer will go to the printer within days following our meeting.

Please look for location and agenda items to come next week, please feel free to email the group or me directly if there are any questions,

Thank you,

On Wed, Sep 23, 2015 at 3:52 PM, Howard Croft <[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)> wrote:

Technical Advisory Team,

I am writing to inform everyone that we have scheduled the next Technical Advisory Committee meeting to be Wednesday October 7<sup>th</sup> 2015 from 2:00 – 4:30 pm. We are extending invitations to Marc Edwards of Virginia Tech along with two lead experts from the EPA (Darren Lytle & Michael Schock) to become a part of the technical team and we are hopeful that they will all be present at the upcoming meeting.

At the meeting we will discuss an overview of the City water system, compliance with the Safe Drinking Water Act, lead concerns, corrosion control, water testing, public education, capital improvement plans, the KWA pipeline, and next steps.

I will forward a specific location and agenda in the near future but we are firmly committing to the time and date. As with previous meetings we look forward to this group having positive dialogue that will benefit the community.

Thank you,

--

**Howard Croft**

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)

--

**Howard Croft**

Public Works Director

City of Flint

1101 S. Saginaw Street

Flint, MI 48502

PH# 810.766.7135 Ext.2043

[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)



# Genesee County Health Department

Mark Valacak, M.P.H., Health Officer  
Gary K. Johnson, M.D., M.P.H., Medical Director

---

## **How does lead get into my tap water?**

Under typical circumstances, lead will dissolve into the water. The concentration of lead in drinking water can vary greatly, depending on the corrosiveness of the water, the type and age of the plumbing materials and the length of time that the water stands in the pipes. The highest levels of lead occur when very corrosive water stands motionless in lead or lead soldered pipe for long periods of time.

## **How do I know if my tap water is contaminated with lead?**

The only way to know whether your tap water contains lead is to have it tested. You cannot see, taste, or smell lead in drinking water. There are different sampling methods for sampling lead in drinking water. To determine your household risk, it is recommended to take a first draw sample.

## **Does lead in my tap water cause health effects?**

Lead can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. Lead in water can be a special problem for infants, whose diets may be mostly liquids, such as baby formulas or concentrated juices mixed with water. Smaller bodies can absorb lead more rapidly than bigger ones. A child's mental and physical growth can be permanently harmed by too much lead. Risk will vary, depending on the individual, the circumstances, and the amount of water consumed.

## **What can I do to reduce or eliminate lead in my tap water?**

Flush your cold-water pipes by running the water for approximately 5 minutes. The longer the water has been sitting in the pipes, the more lead it may contain. You can fill containers for later use, after the flushing process. Use only water from the cold-water tap for drinking, cooking, and especially for making baby formula. Hot water is likely to contain higher levels because it dissolves more lead. You may choose to install a water filter that is NSF-certified for lead removal. If a water filter is installed, replace filters at least as often as recommended by the manufacturer.

Buy a lead-free faucet. The legal definition of "lead-free" still allows brass faucets to contain up to 8 percent lead. However, faucets marked with "NSF 61/9" and/or "California Proposition 65" meet stricter limits. Regularly clean particles from faucet aerators.

**Is it safe to take a bath or shower, if my water has high lead levels?**

Yes. Bathing and showering should be safe for you and your children, even if the water contains lead over EPA's action level. Human skin does not absorb lead in water. This information applies to most situations and to a large majority of the population, but individual circumstances may vary. Some situations, such as cases involving highly corrosive water, may require additional recommendations or more stringent actions.

**Who do I contact for more information?**

The local water authority is always your first source for testing and identifying lead contamination in your tap water. You can visit the City of Flint Website at [www.cityofflint.com](http://www.cityofflint.com) or contact the Flint Water Department at 810-787-6537.

[WWW.EPA.GOV](http://WWW.EPA.GOV)

[WWW.MDEQ.GOV](http://WWW.MDEQ.GOV)



## **CITY OF FLINT**

### **DPW - PUBLIC INFORMATION PLAN**

September 24<sup>th</sup> – Press Conference at Hurley Hospital

September 25<sup>th</sup> – Press Conference at City Hall (Heath Information)

September 30<sup>th</sup> – DPW Committee Meeting (Water Update)

October 7<sup>th</sup> – Technical Advisory Meeting

October 9<sup>th</sup> – Quarterly Water Report

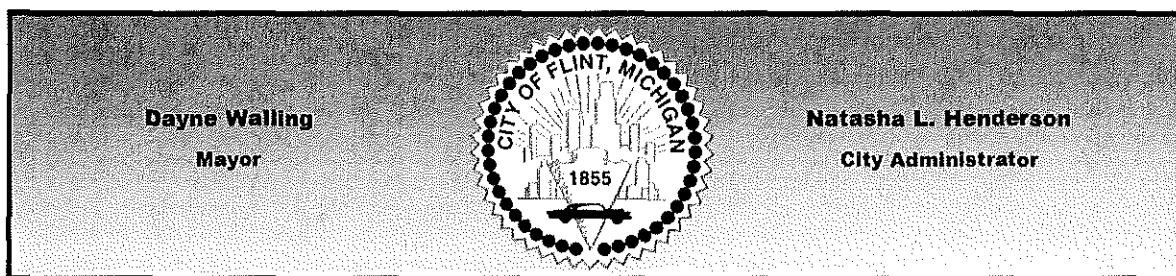
October 13<sup>th</sup> – Meeting with the Board of Health

November 16<sup>th</sup> - Technical Advisory Meeting (Tentative)

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DPW Director will be available for Radio Interviews and Neighborhood Meetings

\*To be scheduled through the City's Public Information Officer



**Jason Lorenz**  
**Public Information Officer**  
Office: (810) 237-2039  
Cell: (810) 875-2576  
[jlorenz@cityofflint.com](mailto:jlorenz@cityofflint.com)

**For Immediate Release**

### **City of Flint Issues Lead Advisory**

**Flint, Michigan – September 25, 2015** – The City of Flint is issuing a Lead Advisory for residents to be aware of lead levels in drinking water after hearing concerns from the medical community. While the City is in full compliance with the Federal Safe Drinking Water Act, this information is being shared as part of a public awareness campaign to ensure that everyone takes note that no level of lead is considered safe.

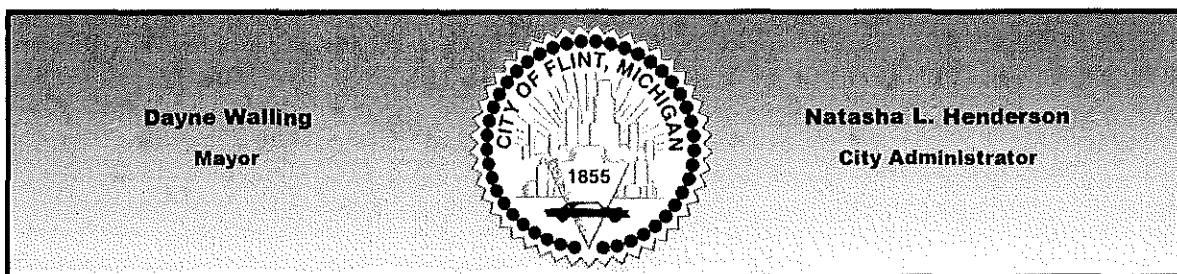
The Genesee County Health Department has issued a fact sheet regarding lead precautions for residents. The fact sheet can be found on their website at [www.gchd.us](http://www.gchd.us). Here are a few of the suggestions the Health Department recommends:

- Flush your cold-water pipes by running the water for approximately 5 minutes
- Use only water from the cold-water tap for drinking, cooking, and especially for making baby formula.
- Install a water filter that is NSF-certified for lead removal.

Lead contamination can leach into water from a home's lead water service lines, lead solder, and leaded plumbing materials including fixtures, faucets, and fittings. Older service lines with pipes and fixtures installed before 1986 can sometimes be more susceptible to lead issues due to materials used in the home such as lead based paint and lead pipes.

This message is meant as a precaution to residents and does not mean that all homes in the City will experience the same issue. Residents with concerns about lead service lines

City Hall  
1101 S. Saginaw Street - Flint, Michigan 48502  
810-766-7346 FAX: 810-766-7218 [www.cityofflint.com](http://www.cityofflint.com)



and lead in home plumbing fixtures are encouraged to contact the City's Utilities Division to schedule a free water testing by calling the Water Treatment Plant at 810-787-6537 and pressing #1 after prompted or by emailing [flintwater@cityofflint.com](mailto:flintwater@cityofflint.com).

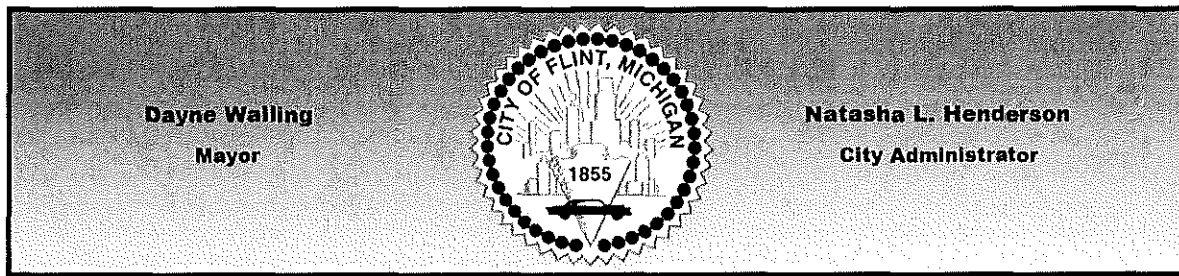
The City of Flint is working proactively along with the County Health Department, the Michigan Department of Environmental Quality, and the U.S. Environmental Protection Agency to improve the water system throughout the City. An accelerated plan to add a corrosion control agent to our water within 30 to 60 days with expedited approval from the Michigan Department of Environmental Quality is already underway. This will reduce corrosion which can cause lead in old pipes to leach into the water.

This plan is in addition to Mayor Walling's letter requesting \$30 Million in water infrastructure assistance funding from the State of Michigan. \$10 Million of that request would be for the replacement of lead service lines in households to ensure that lead no longer presents a danger to the drinking water of our residents. As the letter states, "It is the City's position that the abatement of lead through the removal of lead containing pipes and fixtures in homes is the best long term solution to keeping our residents' water safe."

Mayor Walling further stated: "I am extremely concerned about the risks around lead with Flint's children and I will be working tirelessly to ensure the water is safe and all of our families have the information they need. I also will continue to pursue funding for infrastructure improvements and a comprehensive healthy homes initiative that addresses lead in paint and pipes. We have to get the lead out of our community to eliminate the threat of childhood lead poisoning."

The City of Flint continues working proactively with the County Health Department, the Michigan Department of Environmental Quality, and the U.S. Environmental Protection Agency to improve the water system throughout the City. The City remains committed to working with all of our partners in the Water Technical Advisory Committee to address all





issues of public health and quality concerns that face the community. Updates on progress made in addressing this issue will be made during regular public meetings including City Council and other scheduled meetings. Information on this and all related matters will continue to be posted on the City of Flint's website, [cityofflint.com](http://cityofflint.com).

—END—

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Thursday, September 24, 2015 6:31 PM  
**To:** Wurfel, Brad (DEQ); Wyant, Dan (DEQ); Pallone, Maggie (DEQ); Sygo, Jim (DEQ)  
**Subject:** Fwd: Alert about Soon-to-be Published Associated Press Story on Aging Water Infrastructure  
**Attachments:** AWWA Alert on AP Story.docx; ATT00001.htm; Response to AP (9-24-15)2.docx; ATT00002.htm

FYI.

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

Sent from my iPhone

Begin forwarded message:

**From:** "Benzie, Richard (DEQ)" <[BENZIER@michigan.gov](mailto:BENZIER@michigan.gov)>  
**Date:** September 24, 2015 at 6:27:52 PM EDT  
**To:** "Bloemker, Jon (DEQ)" <[BLOEMKERJ@michigan.gov](mailto:BLOEMKERJ@michigan.gov)>, "Busch, Stephen (DEQ)" <[BUSCHS@michigan.gov](mailto:BUSCHS@michigan.gov)>, "Donaldson, Kristina (DEQ)" <[DONALDSONK@michigan.gov](mailto:DONALDSONK@michigan.gov)>, "Lachance, Amy (DEQ)" <[LACHANCEA1@michigan.gov](mailto:LACHANCEA1@michigan.gov)>, "Thomas, Chuck (DEQ)" <[THOMASC3@michigan.gov](mailto:THOMASC3@michigan.gov)>  
**Cc:** "Philip, Kris (DEQ)" <[PHILIPK@michigan.gov](mailto:PHILIPK@michigan.gov)>, "Butler, Sonya (DEQ)" <[BUTLERS2@michigan.gov](mailto:BUTLERS2@michigan.gov)>, "Fitzner, Wendy (DEQ)" <[FITZNERW@michigan.gov](mailto:FITZNERW@michigan.gov)>, "Green, Kelly (DEQ)" <[GreenK1@michigan.gov](mailto:GreenK1@michigan.gov)>  
**Subject:** FW: Alert about Soon-to-be Published Associated Press Story on Aging Water Infrastructure

FYI. Note that Flint and Detroit are some of the utilities that are reportedly going to be mentioned in this story. They probably got the same alert from AWWA so I don't know that you need to make them aware, but it wouldn't hurt to touch base with them.

The AWWA Alert is using this issue as an opportunity to promote WIFIA. The ASDWA response (second attachment) provides some anticipated questions and answers AND promotes the SRF programs as a possible solution.

ASDWA also suggests each state insert some state specific SRF details (see below) that I am hoping we can provide.

*What is being done in my state to address the problem?*

*Suggest providing your state's figures on SRF funds expended, loans made, and compliance problems addressed. Suggest also mentioning assistance to water systems in*

*preparing projects for funding so they can take advantage of available monies – as well as state technical assistance to operate and maintain their facilities.*

Some of this info was included in the DEQ Update presentation made at the UP Rural Water Conference, the Fall UP Water Institute and the Michigan Section AWWA Annual Conference, and will likely be in the DEQ Update at the four Fall Regional Meetings in October.

You may want to share this info with your staff that could receive calls.

Richard

**From:** Taft, Jim [<mailto:jtaft@asdwa.org>]

**Sent:** Thursday, September 24, 2015 9:56 AM

**To:** Jim Taft

**Subject:** Alert about Soon-to-be Published Associated Press Story on Aging Water Infrastructure

Good morning State Drinking Water Administrators –

We wanted to share this AWWA alert with you (our thanks to AWWA), along with some suggested talking points, for your consideration and use, as you interact with your local press and other stakeholders.

The Associated Press has apparently been working on a drinking water study for several months and is expected to release, some time on Friday, a multi-media news package about the state of drinking water infrastructure, quality, and supply. While we're not able to see and react to the article yet, we believe it will speak to the magnitude of the infrastructure gap in this country and the state of aging and decaying infrastructure -- that is largely hidden from the public. We believe it will also address the issue of appropriated but unspent funds (i.e., ULOs) as well as touch on contaminated sources of drinking water. To prepare for questions that may arise in your states, we've prepared the attached set of Qs and As.

Please let us know if you have any questions on these materials or need more background information. Thank you.

\*\*\*\*\*

**Jim Taft**

Executive Director

Association of State Drinking Water Administrators

1401 Wilson Blvd.; Suite 1225

Arlington, VA 22209

[jtaft@asdwa.org](mailto:jtaft@asdwa.org)

Phone: 703-812-9507

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# ALERT!

## TO UTILITY MEMBERS

### Public Affairs Advisory

**Who: AWWA**

**What: Associated Press series on water**

**When: Friday**

AWWA has learned that on Friday the Associated Press will release a multi-media news package about the state of water infrastructure, quality and supply.

AP has been working on this series for several months, and water utilities should be prepared to answer local questions that arise from the reports. Utilities may wish to reach out to their local media before Friday, offering to provide perspective that makes the series more relevant to local audiences.

The overarching theme of the package, as stated in an article that appeared online before the official series release date, appears to be:

"Around the country, scores of decaying drinking water systems built around the time of World War II and earlier are in need of replacement. The costs to rebuild will be staggering. The costs of inaction are already piling up. The challenge is deepened by drought conditions in some regions and government mandates to remove more contaminants.

"At stake is the continued availability of clean, cheap drinking water — a public health achievement that has fueled the nation's growth for generations."

Among the topics the series will explore are:

- Aging and failing pipes

AWWA urges members to use the AP series as a springboard for urging Congress to repeal the ban on using tax-exempt debt in combination with Water Infrastructure Finance and Innovation Act (WIFIA) loans. Key points: 1) Two trillion dollars in water and wastewater projects are needed over the next 25 years. 2) WIFIA could fix more with less if only tax-exempt debt were allowed to fund the non-WIFIA portion of projects.

Find more information on how Congress can improve WIFIA [here](#). AWWA's Buried No Longer report is also helpful in framing the scope of the drinking water infrastructure challenge.

- Increasing rates
- Harmful algal blooms and cyanotoxins (Find helpful resources in AWWA's Cyanotoxins Resource Community)

- Nitrates from farm fertilizers, with reference to blue baby syndrome
- Drought and climate change
- Desalination, reuse, potable reuse (Access the new Framework for Direct Potable Reuse [here](#).)
- State Revolving Funds and finance issues (It appears at least one story will point out that "the largest federal aid program for improving the nation's crumbling drinking water infrastructure has struggled to spend money in a timely fashion despite demand that far outpaces the amount available.")
- Lead (Consumer information on lead is available on [Drinktap.org](#)).

While the series has not been formally released, there are portions of it posted on a few news outlets. A series of photos from the series suggests there will be some local focus on Ames and Des Moines, Iowa; Orange County (Fountain Valley) and Carlsbad, Calif.; Philadelphia, Pa.; Toledo, Ohio; Pretty, Prairie, Kan.; New Orleans, La.; Flint and Detroit, Mich.

AWWA has many technical and communications resources on each of the topics listed above. Please contact Greg Kail in AWWA Communications with questions.



#### **AWWA Delivers Valuable Member Benefits**

Members receive news and information, periodicals and Section membership, as well as discounts on technical resources, conferences and other online learning opportunities. [Learn more.](#)

Comments or questions? Email [custsvc@awwa.org](mailto:custsvc@awwa.org).  
We welcome your thoughts and suggestions.

*Association of State Drinking Water Administrators*

**Questions & Answers in Anticipation of  
Associated Press Story on Aging Drinking Water Infrastructure  
September 24, 2015**

1. *Is the state of aging drinking water infrastructure in this country as bad as the AP story indicates?*

Yes; the 20-year estimate of needed infrastructure in the most recent EPA survey was about \$384 billion over 20 years. AWWA's estimate, in their "Buried No Longer" report of a few years ago is \$1 trillion. (Their estimate included the replacement costs of more distribution system pipeline than does the EPA estimate.) By any estimate, the magnitude of the need is great. *In my state, we estimate the current drinking water infrastructure need of about \$X over the next 20 years.*

2. *Does aging infrastructure correlate with unsafe water and increased public health risk?*

Sometimes; it depends on the nature of the problem. In some cases, water systems are not able to construct, on a timely basis, needed treatment to comply with some of the more recently promulgated drinking water contaminant rules. In other cases, aging pipelines can break and allow contaminants to be introduced into the water system.

3. *What can be done to address the problem?*

The solutions need to be multi-faceted and involve multiple parties -- there are things that can be done at Federal, state, and local levels. We believe Congress needs to appropriate more funding for Drinking Water State Revolving Loan Funds -- the primary means by which states help water systems build infrastructure by using Federal funds on either a loan or grant basis (or, sometimes, a combination of the two). Approximately \$900 million has been appropriated yearly by Congress for the past few years for this purpose, but it's not nearly enough -- given the \$384 *billion* need. But Federal funds alone can't solve the problem. Local jurisdictions also need to do their part -- setting water rates that adequately recover the costs needed to operate and maintain their

facilities as well as set aside reserve funds for repair/replacement. Water rates in the U.S. have, on average, been relatively low and, in many cases, have not been adequate to recoup the costs of operation and to allow sufficient future planning.

**4. *What about WIFIA (the infrastructure funding program being advocated by the utility groups) is that part of the solution to the problem?***

WIFIA is a newly enacted, Federally-run infrastructure funding program that is designed to operate, on a pilot basis, over a five year period -- and to then be evaluated to determine whether or not it's been effective. In our view, the "jury's still out" on whether WIFIA can perform as envisioned by its proponents. In any case, we believe Congress' principal obligation is to adequately fund the Drinking Water SRF.

**5. *What is being done in my state to address the problem?***

*Suggest providing your state's figures on SRF funds expended, loans made, and compliance problems addressed. Suggest also mentioning assistance to water systems in preparing projects for funding so they can take advantage of available monies -- as well as state technical assistance to operate and maintain their facilities.*

**6. *The article also talks about funds provided by Congress but not yet spent by states -- why is that the case and what's being done to address this problem?***

The issue being referred to is the challenge of Unliquidated Obligations (ULOs) -- i.e., funds appropriated by Congress and made available to states by EPA, but not yet spent. We believe there are several important points to bear in mind here. There will always be some level of ULOs; the complexity of the SRF program and the number of Federally-imposed hurdles can be daunting (e.g., Davis-Bacon, Endangered Species Act, Historic Preservation Act, Buy American Iron & Steel, etc.). In addition, local challenges of working with loan recipients can be time-consuming and contribute to ULO build-up. Despite those various challenges, states have made very good progress in reducing ULOs and are committed to EPA's April 2014 strategy in this regard. The bottom line is that all SRF funds are ultimately spent and spent well. While there are some temporary "pipeline" issues (for some of the reasons mentioned), all of the funds are eventually spent for their intended purpose. Any assertion that SRF appropriations should be scaled back because states can't spend the money in a timely fashion is without merit, in our view. *(It may also be appropriate to describe*

*actions taken, in your state, to speed up the SRF process to get funds out more quickly and projects started sooner.)*

**7. *Is protecting sources of drinking water part of the challenge here?***

Absolutely. Contaminated sources of drinking water place more pressure on the water utility to remove the contamination – making the process more costly and less reliable. The chemical spills upstream of the Charleston, West Virginia drinking water intake and the algal toxins that threatened Toledo, Ohio's drinking water are recent, prominent examples of the threats posed by contaminated source waters. Further, some "emerging" contaminants can pass through or be only partially treated by water systems. Effective provision of safe drinking water at the tap requires a "multi-barrier" approach -- with protection of ground and surface drinking water supplies as the first barrier, followed by water treatment facilities and adequately maintained distribution systems. Protecting sources of drinking water is challenging and requires a multi-party, multi-authority collaborative effort by all concerned parties.

**8. *What about increasingly extreme weather across the country? How does play into this set of considerations?***

It exacerbates the problem. Extreme weather events, including heavy rains and flooding, increase opportunities for source water contamination. Heavy rains and floods can carry contaminants from roadways and agricultural lands into source waters. Heavy rain and flooding can also overwhelm sewers and wastewater infrastructure which can ultimately lead to water-borne disease outbreaks. On the flip side of the extreme weather coin, prolonged drought can force communities to seek out alternative water supplies, which may be significantly more contaminated than their normal water source and more costly to treat.



**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Monday, November 02, 2015 4:19 PM  
**To:** Krisztian, George (DEQ)  
**Subject:** Fwd: City of Flint - Corrosion Control Treatment Operation  
**Attachments:** Flint CCT Operation Letter 10-30-15.pdf; ATT00001.htm

Stephen Busch, P.E.  
 Lansing and Jackson District Supervisor  
 Office of Drinking Water and Municipal Assistance  
 MDEQ  
 517-643-2314

Sent from my iPhone

Begin forwarded message:

**From:** "Shaler, Karen (DEQ)" <[SHALERK@michigan.gov](mailto:SHALERK@michigan.gov)>  
**To:** "[mglasgow@cityofflint.com](mailto:mglasgow@cityofflint.com)" <[mglasgow@cityofflint.com](mailto:mglasgow@cityofflint.com)>  
**Cc:** "[bwright@cityofflint.com](mailto:bwright@cityofflint.com)" <[bwright@cityofflint.com](mailto:bwright@cityofflint.com)>, "[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)" <[hcroft@cityofflint.com](mailto:hcroft@cityofflint.com)>, "Natasha Henderson" <[nhenderson@cityofflint.com](mailto:nhenderson@cityofflint.com)>, "[lytle.darren@epa.gov](mailto:lytle.darren@epa.gov)" <[lytle.darren@epa.gov](mailto:lytle.darren@epa.gov)>, "[SFMatta@lan-inc.com](mailto:SFMatta@lan-inc.com)" <[SFMatta@lan-inc.com](mailto:SFMatta@lan-inc.com)>, "[jwgreen@lan-inc.com](mailto:jwgreen@lan-inc.com)" <[jwgreen@lan-inc.com](mailto:jwgreen@lan-inc.com)>, "[jhenry@gchd.us](mailto:jhenry@gchd.us)" <[jhenry@gchd.us](mailto:jhenry@gchd.us)>, "Dykema, Linda D. (DHHS)" <[DykemaL@michigan.gov](mailto:DykemaL@michigan.gov)>, "Sygo, Jim (DEQ)" <[SygoJ@michigan.gov](mailto:SygoJ@michigan.gov)>, "Busch, Stephen (DEQ)" <[BUSCHS@michigan.gov](mailto:BUSCHS@michigan.gov)>, "Rosenthal, Adam (DEQ)" <[ROSENTHALA@michigan.gov](mailto:ROSENTHALA@michigan.gov)>, "Prysby, Mike (DEQ)" <[PRYSBYM@michigan.gov](mailto:PRYSBYM@michigan.gov)>, "Rennaker, Joanne (DEQ)" <[RENNAKERJ@michigan.gov](mailto:RENNAKERJ@michigan.gov)>  
**Subject:** City of Flint - Corrosion Control Treatment Operation

Mr. Mike Glasgow,

Please see the attached letter from Michael F. Prysby, P.E., District Engineer, Office of Drinking Water and Municipal Assistance, Michigan Department of Environmental Quality. The original will be sent via U.S. Mail on Monday, November 2, 2015.

Karen Shaler, Management Assistant to  
 Chief Deputy Director Jim Sygo  
 Michigan Department of Environmental Quality  
 Constitution Hall, 6th Floor South  
 Phone: 517-284-6709  
 Fax: 517-241-7401  
[shalerk@michigan.gov](mailto:shalerk@michigan.gov) <<mailto:shalerk@michigan.gov>>



RICK SNYDER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING DISTRICT OFFICE



DAN WYANT  
DIRECTOR

October 30, 2015

VIA E-MAIL and U.S. MAIL

Mr. Mike Glasgow  
Utilities Administrator  
City of Flint  
4500 North Dort Highway  
Flint, Michigan 48505

Dear Mr. Glasgow:

SUBJECT: Water Supply – City of Flint (City) – Corrosion Control Treatment Operation

The purpose of this letter is to outline additional requirements and recommendations regarding the additional corrosion control treatment measures being taken by the City water system.

The City has been purchasing drinking water from the Detroit Water and Sewerage Department (DWSD)/Great Lakes Water Authority (GLWA) since Friday, October 16, 2015. DWSD/GLWA provides corrosion control treatment to its water and DWSD/GLWA has been deemed by the Michigan Department of Environmental Quality (MDEQ) to have fully optimized corrosion control treatment. This optimization requires DWSD/GLWA to provide orthophosphate addition, maintain a minimum dose of 0.9 milligrams per liter (mg/L) as  $\text{PO}_4$ , and maintain a DWSD/GLWA plant tap residual of 0.8 mg/L as  $\text{PO}_4$ . As part of its optimization, DWSD/GLWA is also required to maintain a minimum pH of 7.0 at the DWSD/GLWA plant tap.

Corrosion Control Treatment and Operation

To further enhance pipe passivation in the City water distribution system, customer service lines, and customer plumbing, **the City shall dose additional orthophosphate to increase distribution system phosphate residual to a minimum of 3.1 mg/L as  $\text{PO}_4$  (1.0 mg/L as P).** The City has obtained a Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), water system construction permit for the installation of this treatment equipment at Control Station 2 and Pump Station 4, construction permit number W151104, issued on October 28, 2015.

The City should also maintain a minimum pH level of 7.0 throughout the City's water distribution system. If pH levels of 7.0 or less are detected, the City shall immediately notify the MDEQ.

**As part of the City water system operations, the City shall conduct:**

- Daily monitoring of incoming DWSD/GLWA water for pH and for orthophosphate residual, as  $\text{PO}_4$
- Daily monitoring of additional orthophosphate dosage, as  $\text{PO}_4$
- Daily monitoring of water entering the City distribution system for pH and for orthophosphate residual, as  $\text{PO}_4$

This information shall be included in the City's monthly operation report and shall be reported to the MDEQ as required under Administrative Rule 1502 (R 325.11502) of the administrative rules promulgated pursuant to Act 399.

### **Enhanced Water Quality Parameter Monitoring**

The City's revised monitoring schedule dated October 22, 2015, requires quarterly Water Quality Parameter Monitoring at 25 sites throughout the City's water distribution system for temperature (Celcius), Conductivity (mS), pH, Total Alkalinity (mg/L as  $\text{CaCO}_3$ ), Calcium (mg/L as  $\text{Ca}^{2+}$ ), and orthophosphate (mg/L  $\text{PO}_4$ ). Ten of these 25 sites are also used by the City to conduct required total coliform bacteria and chlorine residual monitoring (location numbers 1, 2, 3, 4, 5, 6, 7, 8, CS, and WS). **At these ten locations, the City shall also conduct weekly monitoring for the following parameters at the same time that total coliform bacteria and chlorine residual monitoring is conducted to further assess water stability:**

- |                                               |                                       |
|-----------------------------------------------|---------------------------------------|
| - Turbidity (NTU)                             | - Calcium (mg/L as $\text{Ca}^{2+}$ ) |
| - Iron (mg/L)                                 | - Chloride (mg/L as $\text{Cl}^-$ )   |
| - Orthophosphate (mg/L $\text{PO}_4$ )        | - Temperature (Celcius)               |
| - pH                                          | - Conductivity (mS)                   |
| - Total Alkalinity (mg/L as $\text{CaCO}_3$ ) |                                       |

In addition to the 10 locations, the entry point to the distribution system should be one of the locations for enhanced water quality parameter monitoring.

If orthophosphate residual levels less than 3.1 mg/L as  $\text{PO}_4$  (1.0 mg/L as P) are detected at any of these locations, then orthophosphate dosage shall be increased to achieve the minimum phosphate residual of 3.1 mg/L as  $\text{PO}_4$  (1.0 mg/L as P) at all locations. In addition, if pH levels of 7.0 or less are detected at any of these locations, the City shall immediately notify the MDEQ.

### **Corrosion Control Treatment Test Loops**

To further confirm the effectiveness of corrosion control treatment and the City's operations, it is recommended that the City construct, install, and monitor test loops of service line and plumbing materials. Instructions for construction, installation, and monitoring of these test loops can be obtained from the United States Environmental Protection Agency's (U.S. EPA) Office of Research and Development. The U.S. EPA has also offered to provide analytical services to support this investigative effort. Please contact Mr. Darren Lytle, Acting Branch Chief, at 512-569-7432 or [lytle.darren@epa.gov](mailto:lytle.darren@epa.gov).

### **Lead Service Line Verification Sampling**

The City has been reviewing customer service connection records in order to confirm customer service line materials at each connection. The U.S. EPA has developed a sampling procedure that can be used to help verify the presence of lead service lines and it is recommended that the City conduct this sampling at a selection of customer locations for this purpose. Information regarding this verification sampling can also be obtained from Mr. Lytle. Any water analysis for samples meeting the criteria for inclusion in the 90<sup>th</sup> percentile calculation for lead and copper compliance must be completed by a certified laboratory.

Mr. Mike Glasgow

3

October 30, 2015

**Customer Household Exposure Assessment**

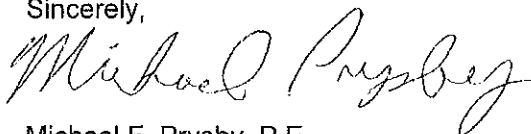
The Michigan Department of Health and Human Services (MDHHS) is continuing to conduct blood lead level testing for children in the City. Families with children found to have elevated blood lead levels will be asked to have an elevated blood lead level investigation conducted at their residence that will include a lead exposure assessment, including the contribution of lead from water service lines and premise plumbing. This diagnostic testing is different than the first draw sampling being conducted by the City and should help further substantiate the effectiveness of corrosion control treatment. Any water analysis samples meeting the criteria for inclusion in the 90<sup>th</sup> percentile calculation for compliance purposes for lead and copper must be completed by a certified laboratory.

**Flint Water Treatment Plant Evaluation of Karegnondi Water Authority (KWA) Raw Water**

The City is planning to change source water in the next year to raw water from Lake Huron purchased from the KWA. The City is required to evaluate the Flint Water Treatment Plant (WTP) processes related to optimization of corrosion control treatment using source water purchased from the KWA to determine if any adjustments are necessary. It is recognized that full scale testing at the Flint WTP may not be feasible. A report of this evaluation shall be provided to our office for review and approval prior to initiating service of this treated water to its customers.

If you have any questions regarding this correspondence, please contact me at the number below or at prysbym@michigan.gov.

Sincerely,



Michael F. Prysby, P.E.  
District Engineer  
Field Operations Section  
Office of Drinking Water and  
Municipal Assistance  
517-290-8817

cc: Mr. Brent Wright, City of Flint  
Mr. Howard Croft, City of Flint  
Ms. Natasha Henderson, City of Flint  
Mr. Darren Lytle, U.S. EPA  
Mr. Samir F. Matta, P.E., Lockwood, Andrews & Newnam, Inc.  
Mr. Warren Green, Lockwood, Andrews & Newnam, Inc.  
Mr. James Henry, Genesee County Health Department  
Dr. Linda Dykema, MDHHS  
Mr. Jim Sygo, Chief Deputy Director, MDEQ  
Mr. Stephen Busch, MDEQ  
Mr. Adam Rosenthal, MDEQ

**Rennaker, Joanne (DEQ)**

---

**From:** Busch, Stephen (DEQ)  
**Sent:** Tuesday, January 27, 2015 5:34 PM  
**To:** Wurfel, Brad (DEQ)  
**Subject:** Fwd: Flint - one more question

Here you go.

Stephen Busch, P.E.  
Lansing and Jackson District Supervisor  
Office of Drinking Water and Municipal Assistance  
MDEQ  
517-643-2314

Sent from my iPhone

Begin forwarded message:

**From:** Chastity Pratt <[cpratt@bridgemi.com](mailto:cpratt@bridgemi.com)>  
**Date:** January 27, 2015 at 4:16:56 PM EST  
**To:** "Busch, Stephen (DEQ)" <[BUSCHS@michigan.gov](mailto:BUSCHS@michigan.gov)>  
**Subject:** Flint - one more question

Hi, Steve,  
The city's website says the water is being monitored daily. When will the MDEQ next notify the public about the water quality?

--

Chastity Pratt Dawsey  
Reporter  
Bridge Magazine/The Center for Michigan  
28 W. Adams Suite 330, Detroit, MI 48226  
[www.bridgemi.com](http://www.bridgemi.com)  
C: 313-310-7867