Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Tuesday, May 28, 2013 3:43 PM
To: Koryzno, Edward (Treasury)
Cc: Sygo, Jim (DEQ); Busch, Stephen (DEQ)
Subject: FW: DWSD response on sunk costs and non-contracted rates
Attachments: SKMBT_65213051611350.pdf

Ed –

Please see the note below.

Staff have identified that delays regarding future cost estimates are impacting the city of Flint's ability to move forward with decisions regarding water treatment plant planning. Based on the attached letter from DWSD, it appears that a cost estimate may not be available for Flint until at least the end of the calendar year.

Does your office have the ability to intervene or persuade parties to cooperate? Is it possible to for your Office to prompt a quicker response?

Appreciate any assistance your Office can provide.

Regards,
Liane

Liane J. Shekter Smith, P.E., Chief
Office of Drinking Water and Municipal Assistance
Michigan Department of Environmental Quality
517-373-9523

From: Busch, Stephen (DEQ)
Sent: Thursday, May 23, 2013 10:36 AM
To: Shekter Smith, Liane (DEQ)
Cc: Bloemker, Jon (DEQ); Benzie, Richard (DEQ); Donaldson, Kristina (DEQ); Prysby, Mike (DEQ)
Subject: DWSD response on sunk costs and non-contracted rates

Liane,

Attached is the letter from DWSD (Sue McCormick) to Treasurer Dillon regarding stranded or sunk costs and non-contracted water rates to the City of Flint and Genesee County water systems. These were requested by the Governor during the meeting I attended on April 20, though DWSD was supposed to provide actual figures by the April 24 response.

While the DEQ does not involve itself in rate negotiations between parties, continued delays in not having these costs and rates negotiated creates burdens on both sides which places the ability to complete other capital improvement and rehabilitation projects in limbo, creating the potential for compliance issues. Uncertainties regarding the future of the DWSD also add complexity to this situation.

As both the City of Flint and City of Detroit will continue to reside under auspices of emergency financial managers administered by the Treasury Department for the near future, it is hoped that resolutions to these issues can be reached in a timely manner.

We would greatly appreciate it if you and/or Director Wyant could relay these concerns as part of the DEQ's continued discussions with the Treasury Department and keep things moving forward. We of course, will continue to provide any technical assistance they might request.

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

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
OFFICE OF THE DIRECTOR

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

April 24, 2013

Mr. Andy Dillon, Treasurer
Michigan Department of Treasury
Lansing, Michigan 48922

Dear Mr. Dillon:

Regarding: Rate Proposal for Flint / Genesee County

As you are aware, during our meeting on Friday, April 20, 2013, the Detroit Water and Sewerage Department (DWSD) was requested to provide a rate proposal to Flint and Genesee County by today based upon the specifications that Flint provided to DWSD on Monday, April 22, 2013. Early this morning, DWSD responded to that request with several documents that were also provided to your office by electronic communication.

In addition to the proposal document, the State of Michigan requested that DWSD include cost figures concerning DWSD's stranded costs associated with capital investment made by DWSD over the years related to serving both Flint and Genesee County as water customers. This issue of "stranded costs" has received significant media attention over the past several months, and my impression is that the State was looking for a clear figure so that there could be subsequent discussion and negotiation over all costs associated with Flint's decision on whether to join Karegondi Water Authority (KWA).

As you may know, State law requires that public utilities such as DWSD must base their rates upon the actual cost of service to particular customers. Additionally, state law limits the length of utility contracts to thirty years, while the useful life of capital assets in the water utility can greatly exceed that thirty year term.

Unfortunately, the computation of stranded costs for DWSD's capital investments in capacity and transmission attributable to Flint's and Genesee's consumption of DWSD water, is a complex calculation that cannot be performed with any level of certainty over the short time period provided by the State of Michigan for this analysis. Further, I have been advised by DWSD's General Counsel that it would not be prudent to engage in a process of trying to guestimate a price range for such a complex computation.

Based upon DWSD's termination of Flint's existing water contract last week, DWSD has roughly twelve months to determine the appropriate cost structure for Flint and Genesee's water consumption over the remaining term of their non-contracted water service from DWSD. DWSD will, however, endeavor to finalize the rate impact of the stranded costs by the end of the current calendar year.

Please rest assure that DWSD's computation will be in accordance with State Law which dictates that such rates will not result in a rate structure that would generate a profit for DWSD. Our intent is simply to compute the rates so that costs properly attributable to Flint and Genesee County will not be borne by the remaining DWSD water customers.

Sincerely,

Sue McCormick
Director

xc: The Honorable Rick Snyder, Governor State of Michigan
Ed Kurtz, Emergency Financial Manager, City of Flint
Kevyn Orr, Emergency Financial Manager, City of Detroit
James Fausone, Chairman, Board of Water Commissioners
William Wolfson, DWSD General Counsel
Nicolette Bateson, DWSD Chief Financial Officer

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Friday, January 09, 2015 1:04 PM
To: Busch, Stephen (DEQ); Rosenthal, Adam (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ)
Subject: FW: Facility Notification: Flint State Office Building

Steve,

Appears certain state departments are concerned with Flint's WQ. I will return the call....

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

From: Wolf, Jennifer (DEQ)
Sent: Friday, January 09, 2015 10:42 AM
To: Prysby, Mike (DEQ)
Cc: VanOtteren, Bruce (DNR); Doll, Jeanette (DTMB)
Subject: FW: Facility Notification: Flint State Office Building

Hi Mike!

Are you handling this one? If so are you able to address Jeanette's below?

SGT. JEN WOLF
MI DEPT. OF ENVIRONMENTAL QUALITY
MI DEPT. OF NATURAL RESOURCES
LAW ENFORCEMENT DIVISION
EMERGENCY MANAGEMENT
DESK: 517-284-6231
CELL: 517-719-0028

From: Doll, Jeanette (DTMB)
Sent: Friday, January 09, 2015 7:33 AM
To: VanOtteren, Bruce (DNR); Wolf, Jennifer (DEQ)
Subject: FW: Facility Notification: Flint State Office Building

Good morning!

My phone call was referencing the advisory our Real Estate Division received from the City of Flint. Just wanted to know if we would know sooner than March 1 on the TTHM levels.

Jeanette

From: DTMB Facilities [mailto:dtmb@govsubscriptions.michigan.gov]
Sent: Wednesday, January 07, 2015 11:49 AM
To: Doll, Jeanette (DTMB)
Subject: Facility Notification: Flint State Office Building

Flint Water Advisory

Date/Time:

Effective Wednesday, January 7, 2015

Details:

The City of Flint recently sent out the attached notice regarding violations to the drinking water standards. While the City of Flint states that corrective actions are not necessary, DTMB is in the process of providing a water cooler on each occupied floor, positioned near the water fountain, so you can choose which water to drink. The coolers will arrive today and will be provided as long as the public water does not meet treatment requirements.

- Flint Water.pdf

Contact:

DTMB Customer Service Center, DTMB-Customerservice@michigan.gov or (517) 373-6227

	Since we spend about 40 hours a week at our workplaces, isn't the office the best place to try out some new energy-saving tricks? The Energy Information Administration estimates that if commercial and industrial buildings improved their energy efficiency by 10 percent, our economy could see yearly savings of nearly $20 billion.

This email was sent to dolli@michigan.gov using GovDelivery, on behalf of DTMB · Lewis Cass Building · 320 South Walnut Street · Lansing, MI 48933 (517) 373-1004

Rennaker, Joanne (DEQ)

From: Wurfel, Brad (DEQ)
Sent: Tuesday, February 03, 2015 11:19 AM
To: Datema, Maggie (DEQ); Wyant, Dan (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: FW: FDCVT - Preliminary Press Release Info
Attachments: Flint (Incinerator)_Redacted.pdf

-----Original Message-----
From: Cole, Evah (Treasury)
Sent: Tuesday, February 03, 2015 9:56 AM
To: Stanton, Terry A. (Treasury)
Cc: Connors, Paul (Treasury); Wurfel, Brad (DEQ); Kolka, Carolyn (Treasury)
Subject: RE: FDCVT - Preliminary Press Release Info

Terry,

Below is additional information regarding the Flint Incinerator also attached is the Incinerator application. Let us know if you need additional information. Thank you.

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	$50,000
Total	$1,100,000

-----Original Message-----
From: Stanton, Terry A. (Treasury)
Sent: Monday, February 02, 2015 4:54 PM
To: Cole, Evah (Treasury)
Cc: Connors, Paul (Treasury); Wurfel, Brad (DEQ)
Subject: Re: FDCVT - Preliminary Press Release Info

Dick now says he talked to Sheldon and he is all set for now. No meeting needed.

He did ask "how the $1.1m for the incinerator" can be used?

Please advise

From: Cole, Evah (Treasury)
Sent: Monday, February 2, 2015 4:03 PM
To: Stanton, Terry A. (Treasury)
Subject: RE: FDCVT - Preliminary Press Release Info

Ok Thanks for the info

From: Stanton, Terry A. (Treasury)
Sent: Monday, February 2, 2015 8:51 AM
To: Cole, Evah (Treasury)
Subject: Fw: FDCVT - Preliminary Press Release Info

Evah...

I may need you to attend a meeting with Dick Posthumus, Paul Connors and me...with Rep. Sheldon Neely from Flint sometime tomorrow.

Dick P is apparently working to schedule it. I will keep you posted as I can.

Thanks, Terry

From: Posthumus, Dick (GOV)
Sent: Monday, February 2, 2015 9:42 AM
To: Stanton, Terry A. (Treasury)
Subject: Re: FDCVT - Preliminary Press Release Info

I will see about scheduling it tomorrow morning and get back with you

Sent from my iPhone

On Feb 2, 2015, at 9:40 AM, "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov<mailto:StantonT@michigan.gov>> wrote:

Dick...

Will the meeting with Rep Neely will be rescheduled? If so, I will need to pass word along to Brad at DEQ and my staff.

Thanks, Terry

From: Posthumus, Dick (GOV)
Sent: Friday, January 30, 2015 4:06 PM
To: Stanton, Terry A. (Treasury)

Subject: Re: FDCVT - Preliminary Press Release Info

We should. Would you call him?

Sent from my iPhone

On Jan 30, 2015, at 4:02 PM, "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov<mailto:StantonT@michigan.gov>> wrote:

Do you want someone from DEQ also (Brad Wurfel?), given their relationship with the city on the water quality?

From: Posthumus, Dick (GOV)
Sent: Friday, January 30, 2015 3:38 PM
To: Stanton, Terry A. (Treasury)
Subject: Re: FDCVT - Preliminary Press Release Info

That and technical issues about the water

Sent from my iPhone

On Jan 30, 2015, at 3:32 PM, "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov<mailto:StantonT@michigan.gov>> wrote:
Will do. Safe to assume their questions revolve around the FDCVT grants?

From: Posthumus, Dick (GOV)
Sent: Friday, January 30, 2015 3:16 PM
To: Stanton, Terry A. (Treasury)
Subject: Re: FDCVT - Preliminary Press Release Info

I'll call him and get him there too. ThNks

Sent from my iPhone

On Jan 30, 2015, at 3:12 PM, "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov<mailto:StantonT@michigan.gov>> wrote:
I'd be happy to Dick, but would suggest that Paul Connors and someone from our Office of Revenue and Tax Analysis, who is very familiar with the grant process, etc. come over as well.

Terry

From: Posthumus, Dick (GOV)
Sent: Friday, January 30, 2015 2:43 PM
To: Stanton, Terry A. (Treasury)
Subject: Re: FDCVT - Preliminary Press Release Info

Terry
Are you available to meet with me and the two Representatives from Flint at 11 on Friday in Rep Sheldon"a office Dick

Sent from my iPhone

On Jan 30, 2015, at 1:46 PM, "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov<mailto:StantonT@michigan.gov>> wrote:

TS

Begin forwarded message:
From: "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov<mailto:StantonT@michigan.gov>>
Date: January 30, 2015 at 1:37:53 PM EST
To: "Murray, David (GOV)" <MurrayD1@michigan.gov<mailto:MurrayD1@michigan.gov>>, "Muchmore, Dennis (GOV)" <muchmored@michigan.gov<mailto:muchmored@michigan.gov>>, "Hollins, Harvey (GOV)" <hollinsh@michigan.gov<mailto:hollinsh@michigan.gov>>, "Clement, Elizabeth (GOV)" <clemente@michigan.gov<mailto:clemente@michigan.gov>>, "Wurfel, Sara (GOV)" <Wurfels@michigan.gov<mailto:Wurfels@michigan.gov>>
Subject: Fwd: FDCVT - Preliminary Press Release Info Here is the prelim grant spreadsheet.

TS

Begin forwarded message:
From: "Stibitz, Brom (Treasury)" <StibitzB@michigan.gov<mailto:StibitzB@michigan.gov>>
Date: January 30, 2015 at 10:22:36 AM EST
To: "Gelisse, Ashley (TREASURY)" <GelisseA@michigan.gov<mailto:GelisseA@michigan.gov>>
Cc: "Stanton, Terry A. (Treasury)" <StantonT@michigan.gov<mailto:StantonT@michigan.gov>>
Subject: FW: FDCVT - Preliminary Press Release Info Do we have any exposure here on grants we have turned down? IE do we have good reasons for the denials?

From: Cole, Evah (Treasury)
Sent: Friday, January 30, 2015 9:24 AM
To: Stibitz, Brom (Treasury); Koryzno, Edward (Treasury)
Cc: Kolka, Carolyn (Treasury)
Subject: FW: FDCVT - Preliminary Press Release Info

Brom & Ed,

Attached for your information is the listing of FDCVT grant awardees. We will be announcing the grants on Monday.

Any questions, let us know.

Thank you.

Evah
3-2864

From: Kolka, Carolyn (Treasury)
Sent: Thursday, January 29, 2015 4:58 PM
To: Allard, Claire (GOV); Stanton, Terry A. (Treasury)
Cc: Cole, Evah (Treasury)
Subject: RE: FDCVT - Preliminary Press Release Info

We have tweaked the descriptions and one funding item.

Carrie

From: Kolka, Carolyn (Treasury)
Sent: Thursday, January 29, 2015 4:37 PM
To: Allard, Claire (GOV); Stanton, Terry A. (Treasury)
Cc: Cole, Evah (Treasury)
Subject: FDCVT - Preliminary Press Release Info

Claire & Terry,

Attached is the preliminary press release for the Financially Distressed Cities, Villages, and Townships (FDCVT) Grant Program. The listing is sorted alphabetically by local unit.

We are awarding the full $8.0 million that was appropriated.

The tentative plan is to make an announcement on Monday, February 2.

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

Carrie
241-7417
<FDCVT FY 15 - Preliminary Press Release Info 01 29 15.xlsx>

RECEIVED
OCT 31 2014
Office of Revenue & Tax Analysis

5193 (08-14), Page 6

Application Due Date: October 31, 2014

Financially Distressed Cities, Villages, and Townships Application (FY 2015)

Issued under authority of 2014 Public Act 252.

PART 1: APPLICANT INFORMATION

1. Applicant Name	2. Applicant Local Unit Code
City of Flint	252040
3. Applicant FEIN	**4. Applicant County**
[redacted]	Genesee

5. Mailing Address	6. City	7. State	8. ZIP Code
1101 S. Saginaw St.	Flint	MI	48502

PART 2: PROPOSAL OVERVIEW

9. Proposal Title
Water Pollution Control Incinerator Shutdown

10. Estimated Start Date	11. Estimated Completion Date
09/01/2014	09/30/2015
12. Estimated Total Proposal Cost	**13. Grant Amount Requested**
$ 2,012,000.00	$ 1,412,000.00

14. Additional Local Units, if Participating in a Shared Service Project (include county and local unit code). Attach letters of support from each of the participating local units.
See attached.

15. Is the applicant(s) willing to devote appropriate resources and time to this proposal?

☒ Yes ☐ No If no, explain why the applicant(s) is unable to devote appropriate resources and time to the proposal.

PART 3: PROPOSAL CONTACT INFORMATION

Note: The proposal contact individual should be a vital part of the grant proposal and will be the Michigan Department of Treasury's contact.

16. Contact Name	17. Contact Title
Howard Croft	Director of Department of Public Works
18. Contact Telephone Number	**19. Contact Fax Number**
(810) 237-2043	(810) 766-7218

20. Contact E-mail Address
hcroft@cityofflint.com

21. Contact Entity Name
City of Flint

PART 4: CONDITIONS OF PROBABLE FINANCIAL DISTRESS

22. Indicate the conditions affecting the applicant that indicate probable financial distress (check all that apply and attach proof of existence for each condition checked).

☐ 1. The governing body or the chief administrative officer of the city, village or township has requested a preliminary review. The request shall be in writing and shall identify the existing or anticipated financial conditions or events that make the request necessary.

☐ 2. The state financial authority has received a written request from a creditor with an undisputed claim that remains unpaid 6 months after its due date against the city, village, or township that exceeds the greater of $10,000.00 or 1% of the annual general fund budget of the city, village, or township, provided that the creditor has notified the city, village or township in writing at least 30 days before the creditor's request to the state financial authority of the creditor's intention to submit a written request.

☐ 3. The state financial authority has received a petition containing specific allegations of financial distress signed by a number of registered electors residing within the city's, village's, or township's jurisdiction equal to not less than 5% of the total vote cast for all candidates for governor within the city's, village's, or township's jurisdiction at the last preceding election at which a governor was elected. The petition shall not have been filed within 60 days before any election of the city, village, or township.

☐ 4. The state financial authority has received a written notification that the city, village, or township has not timely deposited its minimum obligation payment to the city's, village's, or township's pension fund, as required by law.

CITY OF FLINT

OFFICE OF THE EMERGENCY MANAGER

Darnell Earley, ICMA-CM, MPA
Emergency Manager

October 30, 2014

Michigan Department of Treasury
Office of Revenue and Tax Analysis
P.O. Box 30722
Lansing, MI 48909

County: Genesee Local Unit Code: 252040

Please accept this letter as the City of Flint's commitment for the Michigan Department of Treasury Financially Distressed Cities, Villages, and Townships Grant Program. I am in full support of implementing the Water Pollution Control Incinerator Shutdown Project.

The City of Flint needs to implement this project to realize a net $400,000 in annual savings from reduced purchase of natural gas, reduced maintenance and the avoidance of costly federally mandated incinerator upgrades. This savings will strengthen the Sewer Enterprise Fund and provide the capability for necessary investment in the water pollution control infrastructure.

I am committed to ensuring the success and sustainability of this initiative.

Sincerely,

Darnell Earley, ICMA-CM, MPA
Emergency Manager

PART 4: CONDITIONS OF PROBABLE FINANCIAL DISTRESS, CONTINUED

- ☐ 5. The state financial authority has received a written notification that the city, village, or township has failed for a period of 7 days or more after the scheduled date of payment to pay wages and salaries or other compensation owed to employees or benefits owed to retirees.
- ☐ 6. The state financial authority has received a written notification from a trustee, paying agent, bondholder, or auditor engaged by the city, village, or township of a default in a bond or note payment or a violation of 1 or more bond or note covenants.
- ☐ 7. The state financial authority has received a resolution from either the senate or the house of representatives requesting a preliminary review of the city, village, or township.
- ☐ 8. The city, village, or township has violated a requirement of, or a condition of an order issued pursuant to, former 1943 PA 202, revenue bond act of 1933, 1933 PA 94, MCL 141.101 to 141.140, the revised municipal finance act, 2001 PA 34, MCL 141.2101 to 141.2821, or any other law governing the issuance of bonds or notes.
- ☐ 9. The city, village, or township has violated the conditions of an order issued by the local emergency financial assistance loan board pursuant to the emergency municipal loan act, 1980 PA 243, MCL 141.931 to 141.942.
- ☐ 10. The city, village, or township has violated a requirement of sections 17 to 20 of the uniform budgeting and accounting act, 1968 PA 2, MCL 141.437 to 141.440.
- ☐ 11. The city, village, or township has failed to timely file an annual financial report or audit that conforms with the minimum procedures and standards of the state financial authority and is required for cities, villages, and townships under the uniform budgeting and accounting act, 1968 PA 2, MCL 141.421 to 141.440a.
- ☐ 12. The city, village, or township is delinquent in the distribution of tax revenues, as required by law, that it has collected for another taxing jurisdiction, and that taxing jurisdiction requests a preliminary review.
- ☐ 13. The city, village, or township is in breach of its obligations under a deficit elimination plan or an agreement entered into pursuant to a deficit elimination plan.
- ☐ 14. A court has ordered an additional tax levy without the prior approval of the governing body of the city, village, or township.
- ☒ 15. The city, village, or township has ended a fiscal year in a deficit condition as defined in section 21 of the Glenn Steil state revenue sharing act of 1971, 1971 PA 140, MCL 141.921, or has failed to comply with the requirements of that section for filing or instituting a financial plan to correct the deficit condition.
- ☐ 16. The city, village, or township has been assigned a long-term debt rating within or below the BBB category or its equivalent by 1 or more nationally recognized credit rating agencies.
- ☒ 17. There is an existence of other facts or circumstances that, in the state treasurer's sole discretion for a city, village or township, are indicative of probable financial stress. (See attached, additional information)

PART 5: PROPOSAL DETAILS

23. Describe Current Services: What is working well? What is not working?

See attached.

24. Describe Strategy, Project, or Service Proposal:

See attached.

Water Pollution Control Incinerator Shutdown Project Grant Application

Supplemental Responses

Part 4 Question 17.

The City of Flint has been in receivership since December 2011. At that time the State of Michigan Financial Review Team found:

- The City has a general fund deficit of $14,621,546 as of June 30, 2010 which was not eliminated within the two year preceding period.
- The City previously submitted a five year deficit elimination plan for a cumulative general fund deficit of $7,046,820 as of June 30, 2008. However, by June 30, 2010 the cumulative general fund deficit had grown to $14,621,546. An updated plan submitted for 2010 does not purport to eliminate the cumulative deficit until 2030 and that relies upon the issuance of an additional $12 million of debt in 2013.
- A structural operating deficit existed in the general fund as of June 30, 2007, 2008, 2009, 2010 and the general fund is projected to have a $6,768,864 deficit as of June 30, 2011.

The Comprehensive Annual Financial Report for the Fiscal Year ended June 30, 2011 was received in December 2011. The City's General Fund, which had a $14.6 million deficit at the beginning of the year, ended it with an $8.9 million deficit. The reduction in the deficit was due solely to an $8 million Fiscal Stabilization Bond issued by the city in March 2011. In total, excluding the impact of the FSB proceeds and the Genesee Towers judgment levy, expenses in the General Fund exceeded revenues.

The City's Water Supply and Sewage Disposal systems also reported losses of $6.6 million and $14.1 million respectively. Increases in water and sewer fees have been implemented since the end of the fiscal year in an effort to forestall additional losses. However, the increases do not appear sufficient to address past deficits.

The City had actuarial accrued liability for post-employment benefits other than pension (OPEB) of $862 million at June 30, 2011. Currently, the City is operating on a pay-as-you-go basis. In FY11, $19.6 million was spent on premiums for health care, compared to the recommended amount of $61.4 million.

The Auditors comments continued to note concerns with cash flow and with the timeliness of certain account and bank reconciliations.

Part 5. Question 23

Describe Current Services. What is working well? What is not working?

The City of Flint's Water Pollution Control Facility utilizes a sewage sludge incinerator to combust the organic solid or semi-solid by-product of the sewage treatment process for the purpose of reducing the volume of sludge to an ash end product. Incineration is a sludge disposal method that involves firing of

sewage by-product at high temperatures in an enclosed structure. All sludge incinerators use auxiliary fuel (natural gas) for burning. The incinerator is a highly mechanized system of burning and air pollution control that must be managed with a high level of expertise and maintenance. The cost of natural gas has continued to increase. This is a high cost operation for process operator labor and maintenance personnel. New Environmental Protection Agency requirements for incinerator emission limits and operator training must be in compliance by May 2016 following approval of a State plan. In order to meet the new compliance standards capital expenditures must be made which will total $8.75million.

Question 24.

Describe strategy, Project or Service Proposal

The City of Flint has chosen to avoid the costly upgrades required to comply with the new EPA regulations by shutting down the incinerator process and to build a load-out facility which will landfill (Type II Landfill) the sewage sludge by-product and eventually to develop a land application process for the sewage sludge. This project includes the construction of a new biosolids loading building (BLB) – see attached Water Pollution Control Facility drawing, and the proposed load out facility drawing. This project will include the provision of equipment in both the new building and an existing dewatering building to enable conveyance and loading of biosolids cake into trucks or large roll-off containers. Major pieces of equipment will be supplied by the City, such as conveyance equipment in the new building and the existing dewatering building, and biosolids cake pumps to be used to move the cake from the dewatering to the BLB. The existing biosolids dewatering and incineration must be kept functional and in operation during construction. As an end result the incinerator can be shut down and the maintenance staff can be reduced.

Part 5 Question 30

Detailed List of proposed expenditures. Explain how the expenditures support and are essential to the proposal.

Construction Contractor $1,362,000

See Bid Tabulation Sheet – tasks described, includes cost per task and estimated time to completion for each task. This is the construction work necessary to implement the incinerator shutdown.

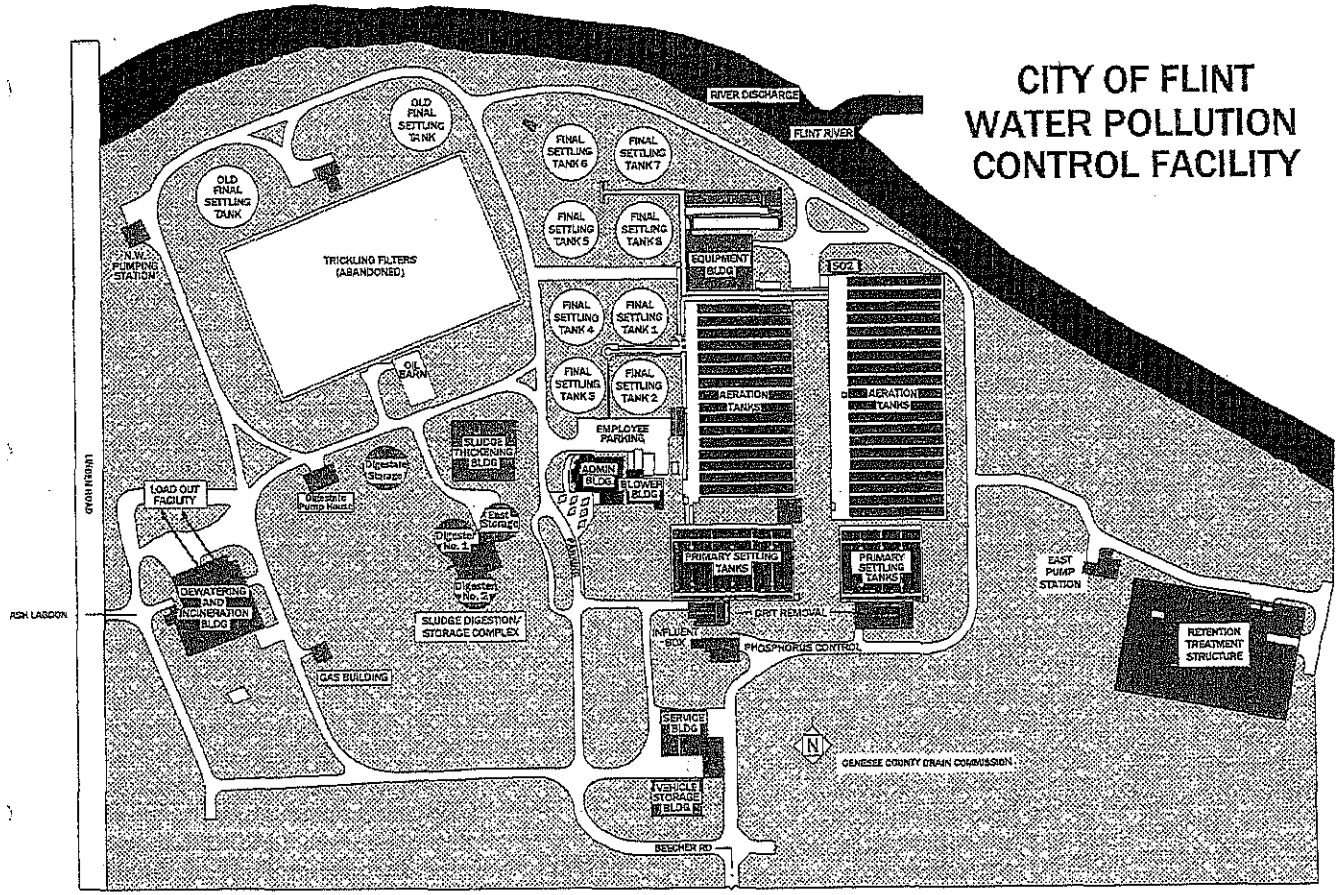
Capital Equipment $600,000

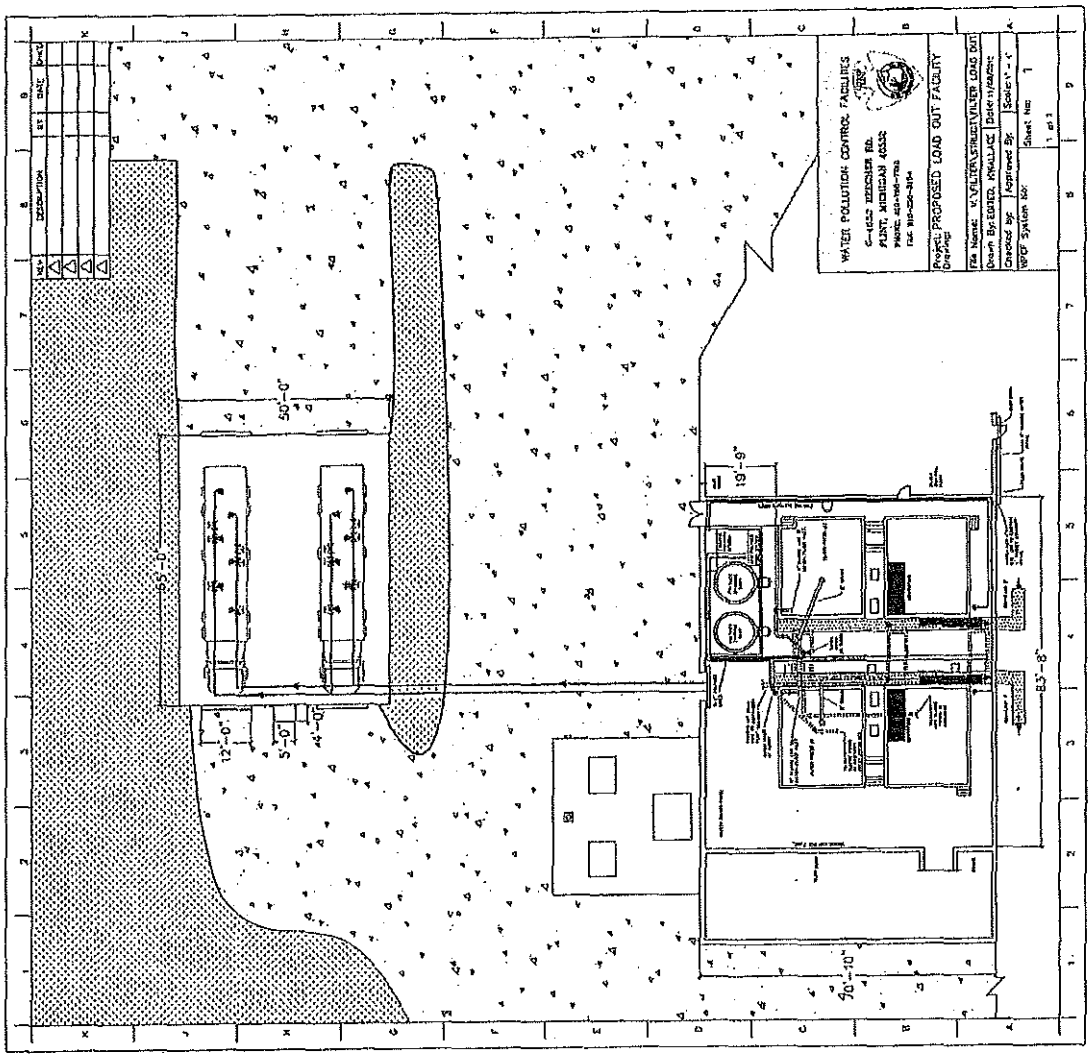
The City of Flint is providing capital equipment needed for this project, including conveyance equipment in the new building and the existing dewatering building; also the biosolid cake pumps which will move the cakes to the biosolids load building (load-out facility).

Project Management $50,000

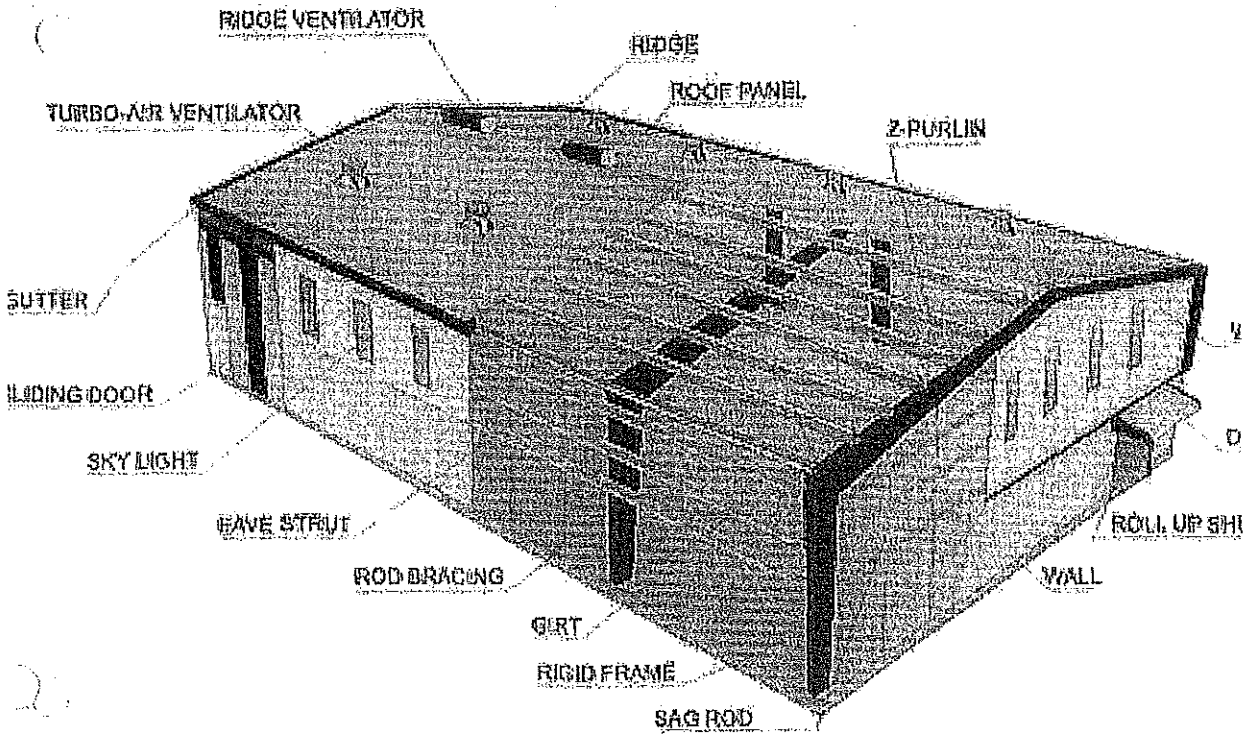
The City does not have an in-house City Engineering staff; project management is therefore contracted with a local engineering firm. The engineer will be responsible for project oversight and necessary reporting.

CITY OF FLINT WATER POLLUTION CONTROL FACILITY




WATER POLLUTION CONTROL FACILITIES
Project: PROPOSED LOAD OUT FACILITY
50'-0"
55'-0"
12'-0"
5'-0"
44'-0"
19'-9"
83'-8"
30'-10"

Pre-Engineering Building



Question 28 C Calulations of Cost Savings

		Incinerator Current Process	Incinerator W/ Required Upgrades	Biosolids w/ Load-Out Facility
Operations Personnel		$312,523	$375,027	$109,383
Maintenance Personnel		$56,098	$49,086	$14,024
Electrical Personnel		$7,487	$7,487	$4,492
Natural Gas		$215,000	$215,000	$0
Electricity		$127,000	$127,000	$30,000
Speciality Contracted Services		$15,000	$15,000	
Landfill Contract		$60,000	$60,000	$250,000
Repair Parts		$30,000	$30,000	$30,000
CEMS Monitoring Supplies		$7,947	$70,000	$0
Process Chemicals		$50,050	$70,000	$50,050
Annual Emissions Testing			$120,000	
Operator Training and Certif.			$20,000	
Recordkeeping and Reporting			$40,000	
	TOTALS Per Year Expenses	$881,105 (See Chart #1)	$1,198,600 (See Chart #2)	$487,949 (See Chart #3)
Capital Expenses			$8,750,000 (see Chart #4)	$1,976,000 (See Attached Bid Tabulation + $600,000 City supplied capital equipment + $50,000 project mgt.)

Summation:

There is an annual savings of **$393,156** by changing from current incinerator process to the load-out facility and closing the incinerator. This is the annual long term savings.

There is an annual cost avoidance savings of **$317,495** comparing the current incinerator process to the upgraded incinerator.

Additionally, there is a **$6,738,000** project cost avoidance by not upgrading the incinerator and instead building the load-out facility. This is the short term savings.

5 Year Total Savings = $6,738,000 (Yr 1) + (4 x $393,156) (Yr 2-5) = $8,310,624

City of Flint
WATER POLLUTION CONTROL DIVISION

Incineration Processing Cost Estimate 2014

Current: O+M Only

DESCRIPTION	COST Per Year*			Per Day	
Operations Personnel	$ 312,522.86	$ 22.00	shifts per week	$ 856.23	
Maintenance Personnel	$ 56,097.95	$ 4.00	shifts per week	$ 153.69	
Electrical Personnel	$ 7,486.82	$ 0.50	shifts per week	$ 20.51	
Natural Gas	$ 215,000.00		FY 2014 Usage	$ 589.04	
Electricity	$ 127,000.00			$ 347.95	
Specialty Contracted Services	$ 15,000.00			$ 41.10	
Repair Parts	$ 30,000.00			$ 82.19	
CEMS Monitoring Supplies	$ 7,947.00			$ 21.77	
Process Chemicals	$ 50,049.60		FBP Polymer	$ 137.12	
Total Cost of Incineration	$ 821,104.22			$ 2,249.60	
Sludge Processed (Wet Tons)	10,870		per calendar year	29.8	per calendar day
COST OF INCINERATION per WET TON OF SLUDGE				$ 75.54	per WT

RJC 10-28-14
orig - 03/18/2013

Chart #1

City of Flint
WATER POLLUTION CONTROL DIVISION

Incineration Processing Cost Estimate 2016

DESCRIPTION	COST Per Year*		Per Day	
Operations Personnel (full staff)	$ 375,027.43	$ 22.00 shifts per week	$ 1,027.47	
Maintenance Personnel	$ 49,085.70	$ 3.50 shifts per week	$ 134.48	
Electrical Personnel	$ 7,486.82	$ 0.50 shifts per week	$ 20.51	
Natural Gas	$ 215,000.00	FY 2014 Usage	$ 589.04	
Electricity	$ 127,000.00		$ 347.95	
Specialty Contracted Services	$ 15,000.00		$ 41.10	
Mechanical and Instrumentation Par	$ 60,000.00		$ 164.38	
CEMS Monitoring and Supplies	$ 70,000.00		$ 191.78	
Process Chemicals	$ 70,000.00	FBP Polymer	$ 191.78	
Ash Disposal	$ 60,000.00		$ 164.38	
NEW REQUIREMENTS				
Annual Emission Testing	$ 120,000.00			
Operator training and Certification	$ 20,000.00			
Recordkeeping and Reporting	$ 40,000.00			
Total Cost of Incineration	$ 1,228,599.95		$ 3,366.03	
Sludge Processed (Wet Tons)	10,870	per calendar year	29.8	per calendar day
COST OF INCINERATION per WET TON OF SLUDGE			$ 113.03	per WT

RJC 10-28-14
orig - 03/18/2013

Chart #2

City of Flint
WATER POLLUTION CONTROL DIVISION

Biosolids Landfilling Cost Estimate 2016

Future Proj.: O+M Only

DESCRIPTION	COST Per Year*			Per Day	
Operations Personnel	$ 109,383.00	$ 7.00	shifts per week	$ 299.68	
Maintenance Personnel	$ 14,024.49	$ 1.00	shifts per week	$ 38.42	
Electrical Personnel	$ 4,492.09	$ 0.30	shifts per week	$ 12.31	
Natural Gas	$ -			$ -	
Electricity	$ 30,000.00			$ 82.19	
Landfill Contract Tip and Haul Service	$ 250,000.00			$ 684.93	
Repair Parts	$ 30,000.00			$ 82.19	
CEMS Monitoring Supplies	$ -			$ -	
Process Chemicals	$ 50,049.60		FBP Polymer	$ 137.12	
Total Cost of Incineration	$ 487,949.18			$1,336.85	
Sludge Processed (Wet Tons)	10,870		per calendar year	$29.78	per calendar day
COST OF INCINERATION per WET TON OF SLUDGE				$ 44.89	per WT

Loadout Facility

RJC 10-28-14
orig - 03/18/2013

Chart #3

Required Upgrades: Part 60

City of Flint
WATER POLLUTION CONTROL DIVISION

Incineration Cost Study:

Projected Regulatory Compliance Expenses for New MACT Standards

The following are major capital expense estimates to comply with new incinerator emissions regulations under Section 129 of the Clean Air Act. (40 CFR Part 60, Subpart MMMM).

DESCRIPTION	ESTIMATED COST
Upgraded more powerful ID Fans	$ 480,000.00
VenturiPak and Other Scrubber Add-ons	$ 6,400,000.00
Low Nox Burners	$ 560,000.00
Upgraded Instrumentation and Controls	$ 320,000.00
New CEMS (Emission Monitors)	$ 480,000.00
Emissions Testing - Startup	$ 160,000.00
Operator Training	$ 50,000.00
New Permit (Title V) Preparation	$ 60,000.00
Administration and Engineering	$ 240,000.00
Total Cost of Incinerator Upgrades for Part 60 MMMM Compliance	$ 8,750,000.00

KLW - 03/18/2013

S:\CONTRACT\Truck Loading Facility\Incinerator Reg Compl 129 Expense 2014.xls

Chart #4

REQUIREMENT / TABULATION

Bidder herby agrees to complete the Work in accordance with the Contract Documents for the following lump sum price(s):

TASK	GENERAL DESCRIPTION	ESTIMATED TIME TO COMPLETE	COST
1	Installation of two new Owner-supplied progressive cavity cake pumps for dewatered biosolids.	6 wks.	91,902.00
2	Modification of existing conveyor belts.	1 wk.	28,553.00
3	Installation of Owner-supplied new screw conveyors in the Dewatering Building.	4 wks.	54,878.00
4	Installation of a piping system to conduct the biosolids from the dewatering building to the new building.	14 wks.	217,755.00
5	Construction of a new building to house truck loading equipment for the biosolids.	18 wks.	745,022.00
6	Installation of Owner-supplied new screw conveyors in the new building.	5 wks.	67,150.00
7	Site improvements to facilitate trucking of the biosolids off plant grounds, including a new automatic gate and paving work.	1 wk.	156,740.00
100% Complete		GRAND TOTAL	$ 1,362,000.00

Bidder certifies that:

This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

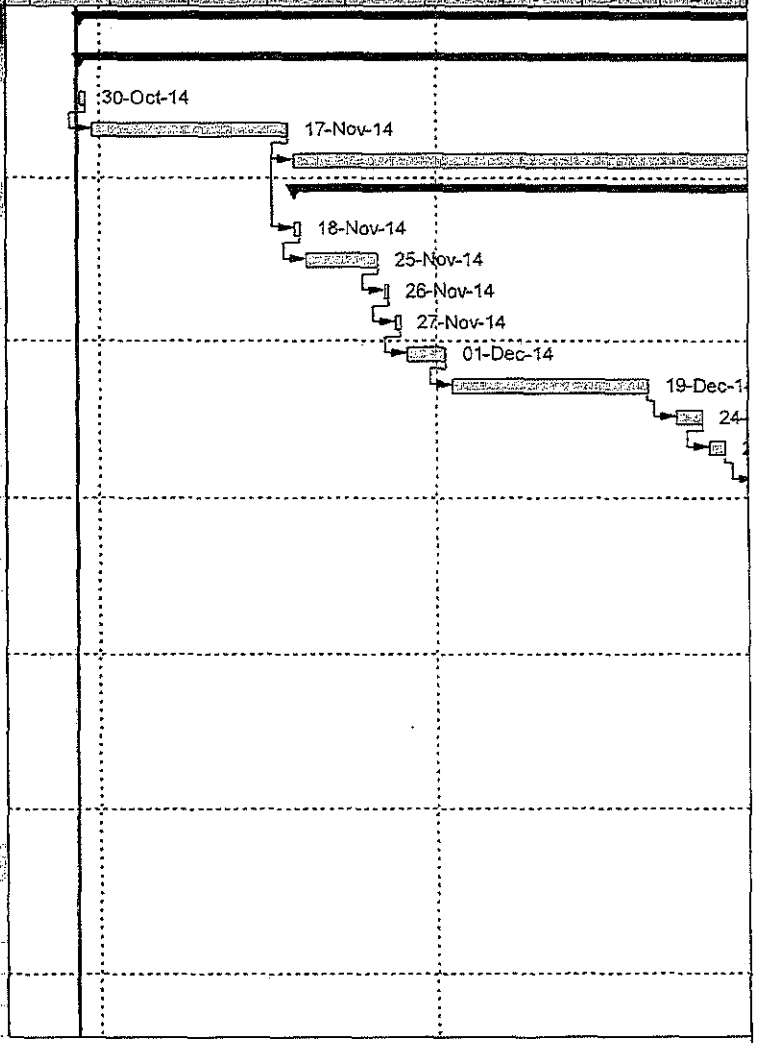
Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

Bidder has not solicited or induced any individual or entity to refrain from bidding; and

Alt. #1: Deduct $20,500 –

City of Flint Bio-Solids Building | Classic WBS Layout w/ 3 line timescale | 30-Oct-14 09:34

Activity ID	Activity Name	Start	Finish
City of Flint Bio-Solids Building		30-Oct-14	13-Oct-15
Pre-Construction		30-Oct-14	03-Feb-15
A1000	Pre Construcion Meeting	30-Oct-14	30-Oct-14
A1010	Submittals	31-Oct-14	17-Nov-14
A1020	Building Procurement	18-Nov-14	03-Feb-15
Phase #1 Construction		18-Nov-14	27-Jan-15
A1030	Mobilization	18-Nov-14	18-Nov-14
A1040	Site Clearing	19-Nov-14	25-Nov-14
A1050	Sesc Measures	26-Nov-14	26-Nov-14
A1060	Cut Site to Proposed Depth	27-Nov-14	27-Nov-14
A1070	Layout	28-Nov-14	01-Dec-14
A1080	Site Piping	02-Dec-14	19-Dec-14
A1090	Bore For Casons	22-Dec-14	24-Dec-14
A1100	Set Resteel	25-Dec-14	26-Dec-14
A1110	Pour Casons	29-Dec-14	31-Dec-14
A1120	Form Footing	01-Jan-15	01-Jan-15
A1130	pour Footings	02-Jan-15	02-Jan-15
A1140	Cure	05-Jan-15	07-Jan-15
A1150	Form Foundations	08-Jan-15	09-Jan-15
A1160	Pour Foundations	12-Jan-15	12-Jan-15
A1170	Cure	12-Jan-15	14-Jan-15
A1180	Backfill	15-Jan-15	16-Jan-15
A1190	Form Slab	19-Jan-15	19-Jan-15
A1200	Pour Slab	20-Jan-15	21-Jan-15
A1210	Cure	22-Jan-15	26-Jan-15
A1230	Cover Slab until Spring	27-Jan-15	27-Jan-15
Phase #2 Construction		18-Mar-15	28-Sep-15
A1240	Erect Steel Building	18-Mar-15*	28-Apr-15
A1250	Masonry	29-Apr-15	04-May-15
A1260	Form Approns	05-May-15	06-May-15
A1270	Pour Approns	07-May-15	07-May-15
A1280	COld Mill Site	08-May-15	12-May-15



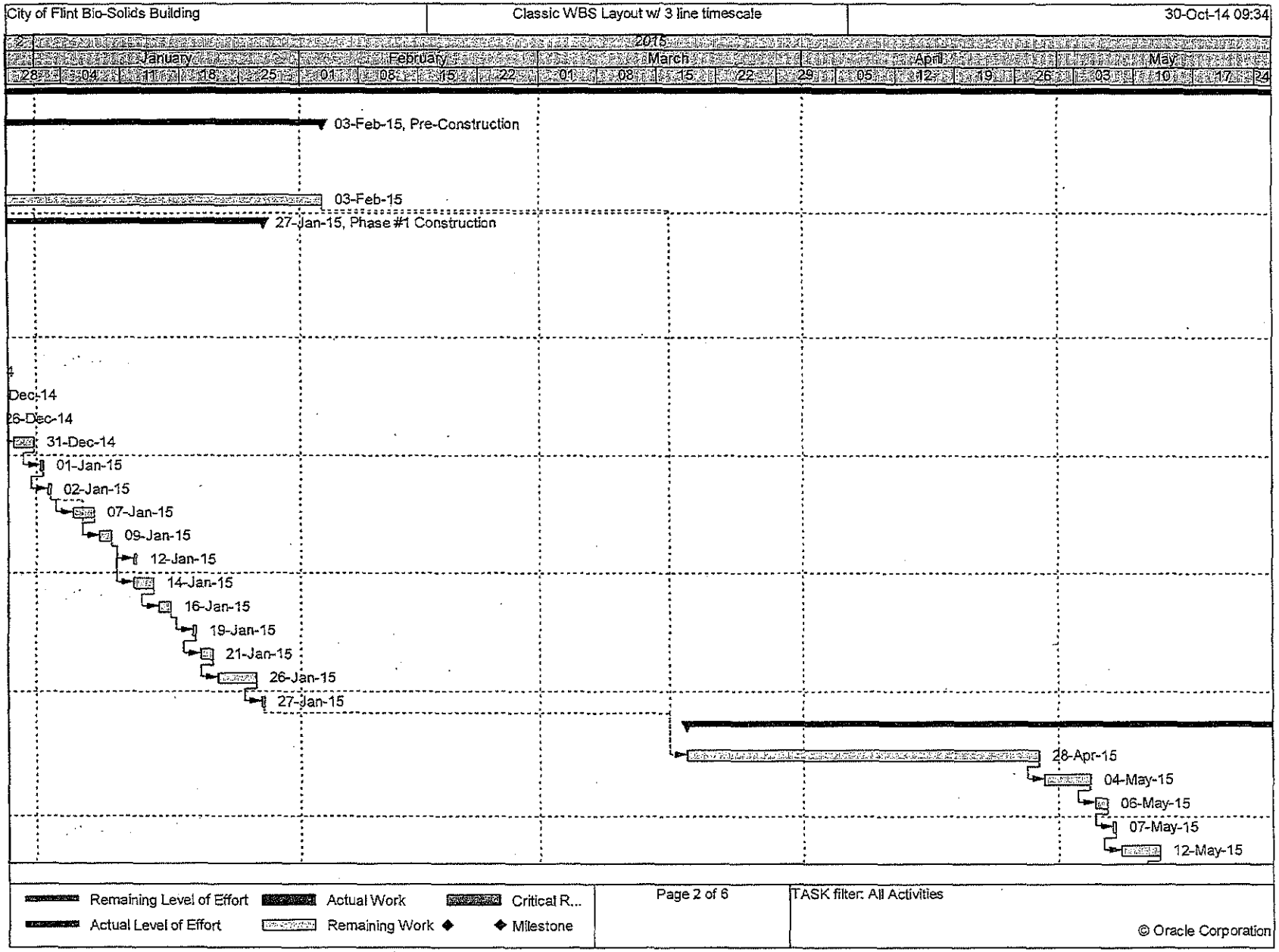
Remaining Level of Effort | Actual Work | Critical R...
Actual Level of Effort | Remaining Work | Milestone

Page 1 of 6

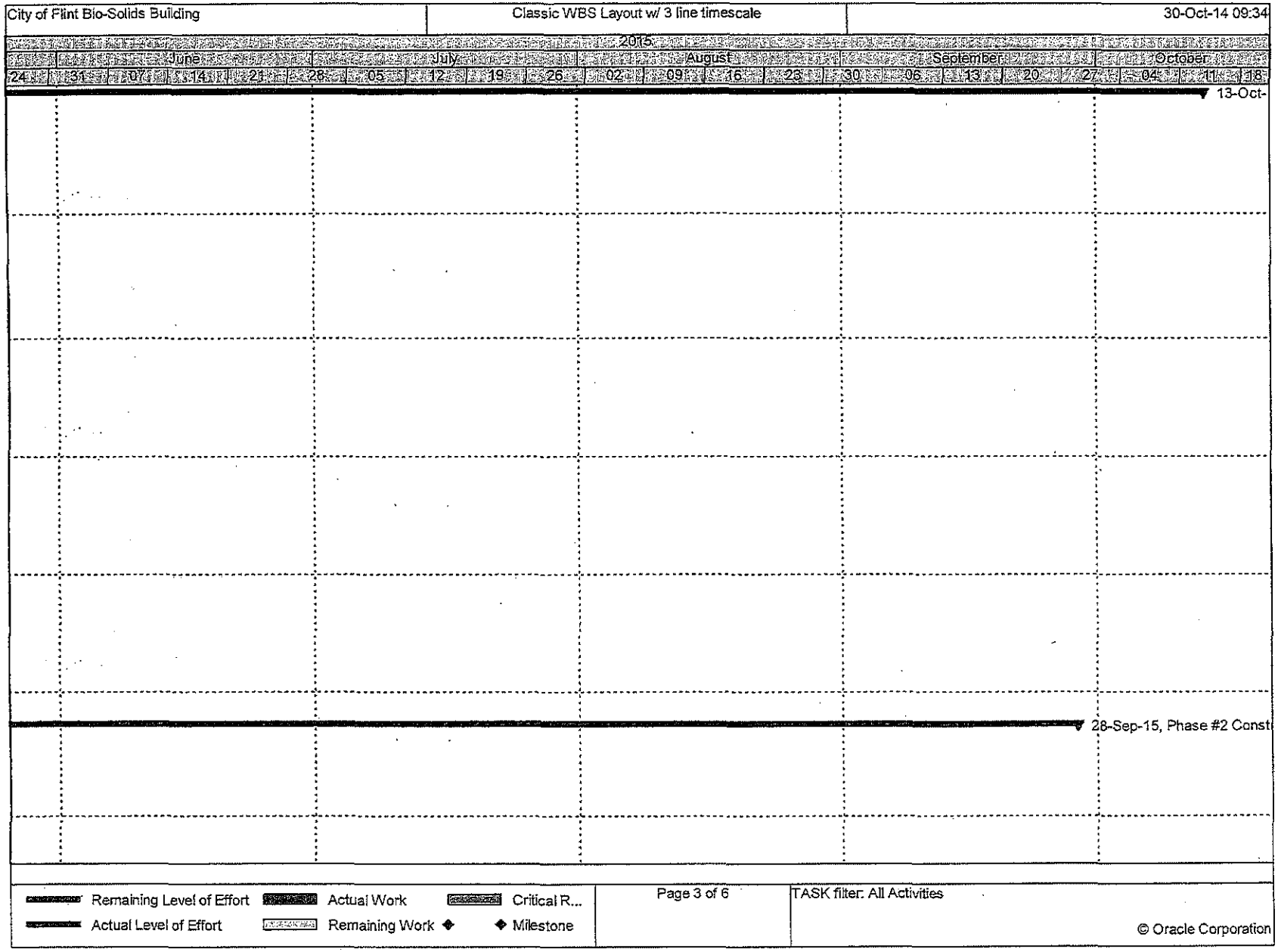
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WORK PLAN p. 1 of 6



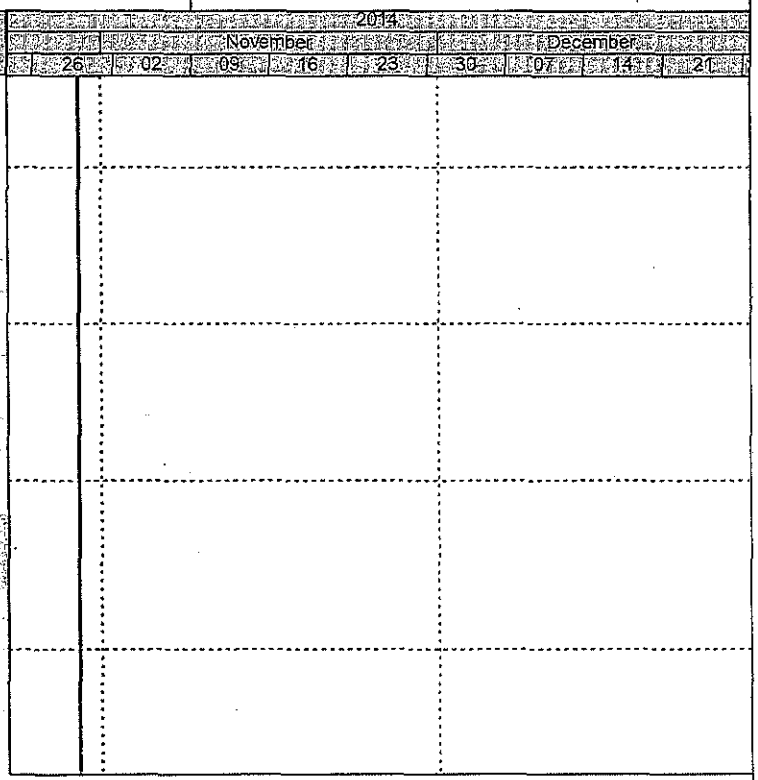
WORK PLAN P. 2 of 6



WORKPLAN p. 3 of 6

City of Flint Bio-Solids Building | Classic WBS Layout w/ 3 line timescale | 30-Oct-14 09:34

Activity ID	Activity Name	Start	Finish
A1290	Structural Steel Mezzanine	13-May-15	28-May-15
A1300	Install owner supplied Pumps	29-May-15	25-Jun-15
A1310	Install Screw Conveyor system	26-Jun-15	16-Jul-15
A1320	Rough Electrical	17-Jul-15	30-Jul-15
A1330	Rough Plumbing	31-Jul-15	20-Aug-15
A1340	GHU Unit	21-Aug-15	25-Aug-15
A1350	Set Overhead Doors	26-Aug-15	27-Aug-15
A1360	Set Man Doors	28-Aug-15	28-Aug-15
A1370	Painting	31-Aug-15	02-Sep-15
A1380	Start Up of New System	03-Sep-15	09-Sep-15
A1390	Demo Existing	10-Sep-15	16-Sep-15
A1400	Asphalt	17-Sep-15	22-Sep-15
A1410	Site Resotration	23-Sep-15	24-Sep-15
A1420	New Gate	25-Sep-15	28-Sep-15
Site Work			
Substantial Completion		29-Sep-15	13-Oct-15
A1430	Substaintal Completion	29-Sep-15	29-Sep-15
A1440	Walk Through	30-Sep-15	30-Sep-15
A1450	Punch List	01-Oct-15	07-Oct-15
A1460	Final Completion	12-Oct-15	12-Oct-15
A1470	Training	08-Oct-15	09-Oct-15
A1480	Closeout Docs	13-Oct-15	13-Oct-15

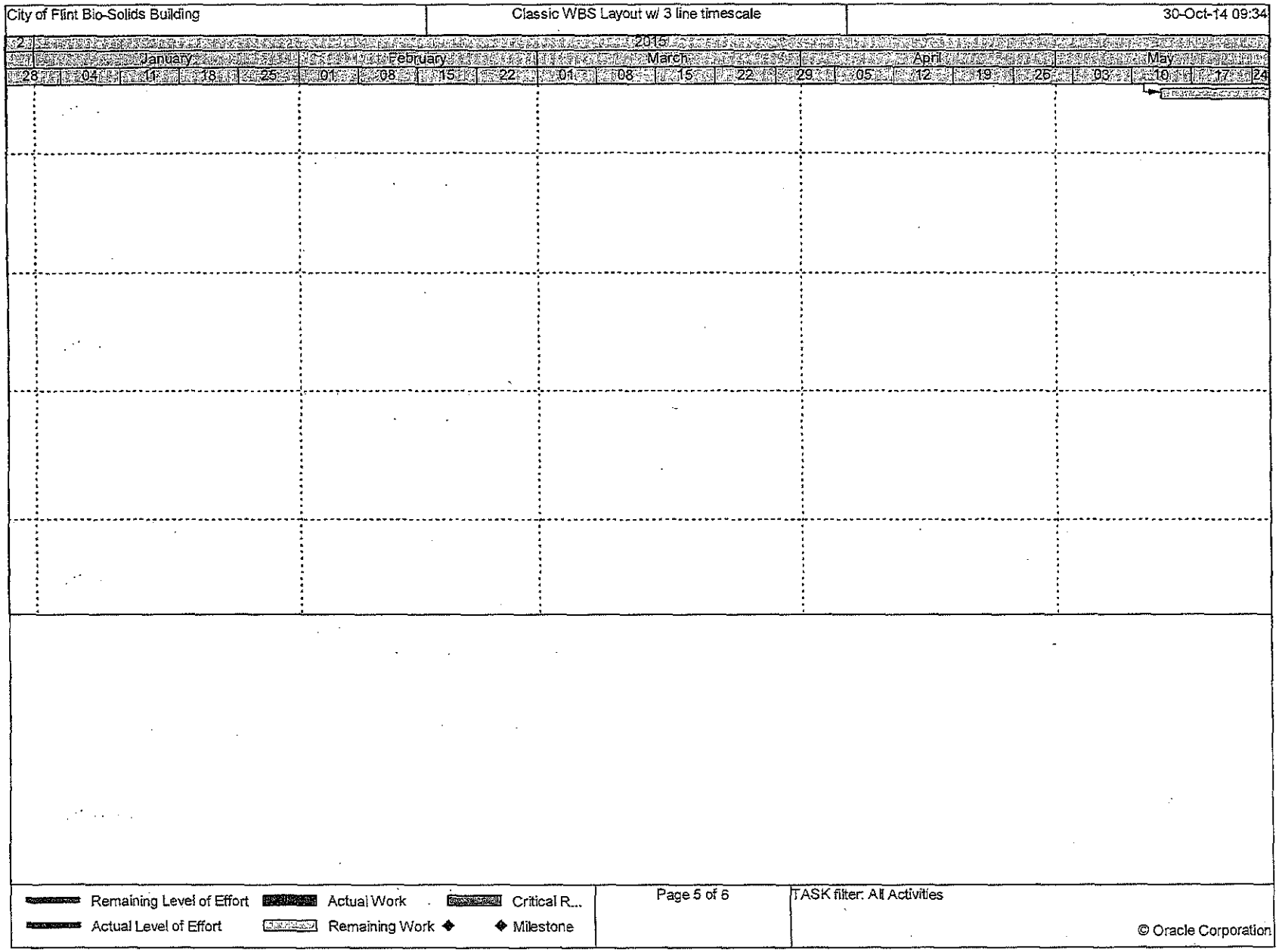


Remaining Level of Effort | Actual Work | Critical R...
Actual Level of Effort | Remaining Work | Milestone

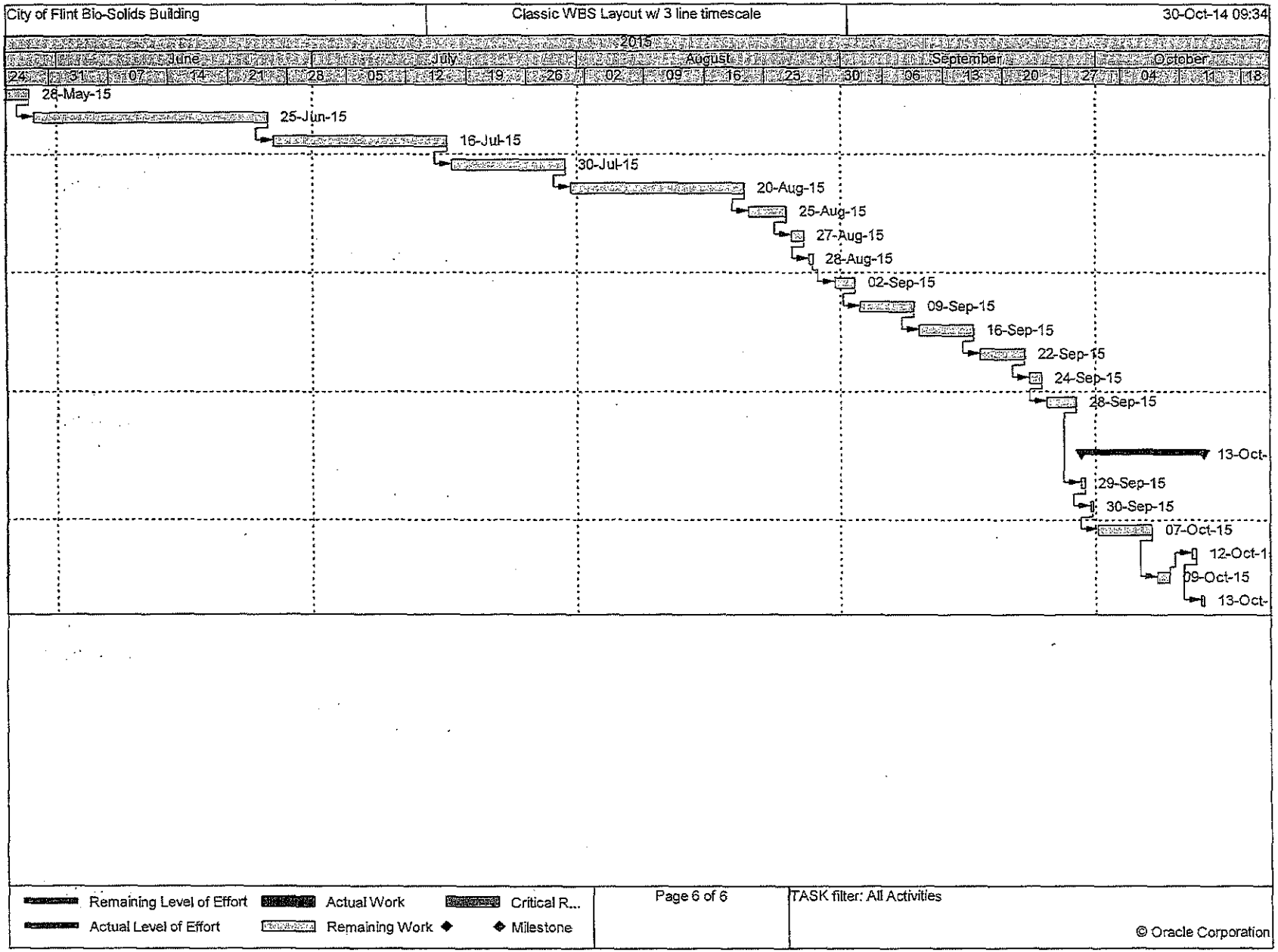
TASK filter: All Activities

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WORKPLAN D.4 of 6



WORKPLAN P. 5 of 6



WORK PLAN p. 6 of 6

PART 5: PROPOSAL DETAILS, CONTINUED

25. Describe How Grant Funding will Lead the Applicant Toward Financial Stability:

The Water Pollution Control Facility is funded through the Sewage Enterprise Fund which receives revenue via residential water bills and commercial sewage strength calculations and billing. The fund has been replenished in recent years, though significant rate increases were required to do so. The City seeks savings in operations to decrease expenditures, realize savings and stabilize rates. Maintaining a healthy fund balance allows the City the opportunity to make needed investments in the water pollution control infrastructure.

26. Goals, Measures, and Business Objectives of this Proposal: What are the outcomes you hope to achieve? How will you measure the outcomes? Provide the measures which will be used to determine the success of the proposal.

The goal is shut down of the Water Pollution Control Facility incinerator. This shut down will mean an immediate savings in natural gas purchase, a reduction in maintence staff and the cost avoidance of a very expensive EPA compliance requirement. Savings will be reflected in the quarterly budget expense reports and year over year expense comparisons.

27. Potential Barriers: Describe any barriers that currently exist that may have an impact on the implementation of the proposal.

The City has sent requests for proposals; this was followed by selecting a construction vendor and executing a contract. Seven task areas were identified and the estimated completion time and costs for each task is attached as part of Question #29. As the end of the 2014 construction season is approaching the vendor has been encouraged to get outdoor work underway as quickly as possible. At this point it is still expected that the project can be completed and be fully operational by December 1, 2015.

28. Cost Savings: Will the proposal save money? ☒ Yes ☐ No

A. SHORT-TERM (1 year or less) ☒ Yes ☐ No		Estimated Short-Term Savings $ 6,738,000.00
B. LONG-TERM (Greater than 1 year) ☒ Yes ☐ No		Estimated Annual Long-Term Savings $ 393,156.00
		Estimated 5 Year Total Savings $ 8,310,624.00

C. Did you attach a detailed calculation of the cost savings and provide an explanation of how the cost savings were calculated?

☒ Yes ☐ No

29. Work Plan and Proposal Timeline: What are the implementation steps to ensure this proposal's success? What are the projected outcomes at each step?

See attached Workplan - 6 pages:

PART 5: PROPOSAL DETAILS, CONTINUED

30. Total Grant Budget Worksheet: For each budget category, attach a detailed list of proposed expenditures. Explain how the expenditures support and are essential to the proposal.

Budget Category	Estimated Total Proposal Cost	Grant Budget Amount Requested (Total Limited to $2.0 million)
Construction Contractor	$ 1,362,000.00	$ 1,362,000.00
Capital Equipment (COF)	$ 600,000.00	$ 0.00
Project Management	$ 50,000.00	$ 50,000.00
	TOTAL ESTIMATED PROPOSAL COST $ 2,012,000.00	TOTAL GRANT AMOUNT REQUESTED $ 1,412,000.00

31. Additional Information and Comments:

Attachments also include the request for proposal project requirements, the summary of EPA Regulations Controlling Air Emissions from Sewage Sludge Incinerators, and a letter of support from Flint's State Senator Jim Ananich.

PART 6: CERTIFICATION

32. I certify that all statements in this application, including all requested supplemental information, are true, complete and accurate to the best of my knowledge. If awarded, I agree to allow the Michigan Department of Treasury and the State Auditor General's Office (and/or any of their duly authorized representatives) access, for the purposes of inspection, audit, and examination, to any books, documents, papers, and records of the grantee which are related to this proposal. I agree to allow the Michigan Department of Treasury to conduct periodic program reviews of the proposal. The purpose of these reviews will be to determine adherence to stated proposal goals and to review progress of the proposal in meeting its objectives. I agree to submit semiannual and final narrative and financial status reports and a one-year Final Follow-up Report to the Michigan Department of Treasury. I understand that failure to submit any required reports may result in the termination of the grant. I understand that this grant may be terminated if the Michigan Department of Treasury concludes that I am not in compliance with the conditions and provisions of this grant, or have falsified any information. By way of signature, I agree with all conditions of this grant program.

Applicant's Chief Administrative Officer Signature (as defined in MCL 141.422b)	Date
Darnell Earley	10-31-2014
Printed Name of Applicant's Chief Administrative Officer (as defined in MCL 141.422b)	**Title**
Darnell Earley, ICMA-CM, MPA	Emergency Manager

Applications are due October 31, 2014. Completed applications submitted via mail or e-mail must be received by the Michigan Department of Treasury no later than 11:59 p.m. on Friday, October 31, 2014. Incomplete applications may not be considered.

A signed and completed application (including attachments) can be submitted by e-mail to TreasRevenueSharing@michigan.gov or by mail to:

Michigan Department of Treasury
Office of Revenue and Tax Analysis
PO Box 30722
Lansing, MI 48909

What are the compliance dates?

EXISTING SOURCES:

Emission limits: As expeditiously as practicable after State plan approval, but no later than 3 years after State plan approval or by May 20, 2016, whichever is earlier.

Operator training: Must be completed by the later of: the final compliance date; 6 months after unit startup; or 6 months after an employee assumes responsibility for operating the unit or supervising operation of the unit.

NEW SOURCES:

Emission limits: Within 60 days after your SSI unit reaches the feed rate at which it will operate, or within 180 days after initial startup, whichever is earlier.

Operator training: Six months after your SSI unit starts up, or before an employee assumes responsibility for supervising or operating the unit.

What reports are required?

- New sources: Notification of construction (including a siting analysis) and notification of initial startup.
- Existing sources taking more than 1 year to comply: Final control plan and notification of increments of progress.

All Sources:

- Monitoring plan for each continuous monitoring system, bag leak detection system and ash handling system.
- Initial and annual compliance reports and deviation reports.
- Submittal to EPA's Central Data Exchange of performance test data and relative accuracy test audit data for continuous monitors (using EPA's Electronic Reporting Tool).

What records are required?

- Records of operator training.
- Records that demonstrate compliance with emission limits, including records for testing, operating parameters, and continuous monitoring.
- Records of air pollution control device inspections.
- Records of all plans, reports, and notifications.
- Records of inspections, calibrations, validation checks, monitoring plans, and performance evaluation results of monitoring control devices.
- Records of bypass stack usage.
- Records of malfunctions.

For More Information

Copies of the rule and other materials are located at:
http://www.epa.gov/ttn/atw/129/ssi/ssipg.html

For more information on this regulation, please call your state or local air pollution control agency or the EPA Regional Office covering your state. EPA Regional contact information can be found on the Internet, at the following address:
http://www.epa.gov/aboutepa/index.html#regional

For more information on state requirements, please contact your state representative found at the following link:
http://www.4cleanair.org/contactUsaLevel.asp

United States Environmental Protection Agency
http://www.epa.gov/ttn/atw/129/ssi/ssipg.html

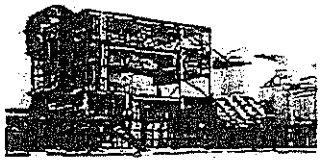
September 2011

Office of Air Quality Planning & Standards

EPA

Summary of Regulations Controlling Air Emissions from

Sewage Sludge Incinerators



Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Sewage Sludge Incineration Units (40 CFR Part 60, Subparts LLLL and MMMM)

FINAL RULE
March 21, 2011 (76 FR 15372)

Which SSI units are affected?

- SSI units located at wastewater treatment facilities that are designed to treat domestic sewage sludge.

What is an SSI unit?

- An SSI unit is an incineration unit combusting sewage sludge for the purpose of reducing the volume of the sewage sludge by removing combustible matter.
- An SSI unit includes the following:
  - Sewage sludge feed system, auxiliary fuel feed system, grate system, flue gas system, waste heat recovery equipment, and bottom ash system.
  - All ash handling systems connected to the bottom ash handling system.

How do I comply?

You comply by obtaining operator training and demonstrating that your SSI meets specified air pollutant emission limits, as summarized in the table above. The emission limits are based on the construction date of the unit and the type of unit.

Obtain Operator Training and Qualification

- Obtain operator training through a state-approved program or by completing the requirements in the rule, which include a state-approved examination.
- Establish a program for reviewing with plant personnel the operator training procedures and information such as how to operate the incinerator and air pollution control systems to meet the rule's requirements.
- Complete an annual review or refresher course.

Summary of Sewage Sludge Incinerator Emission Limits and Operator Training Requirements

SSI Unit [1]	Summary of Requirements [2]
Existing SSI units: Commenced construction or reconstruction of the unit on or before October 14, 2010	
Fluidized bed Multiple hearth	• Obtain and maintain operator training and qualification. • Meet emission limits for PM, HCl, dioxins/furans, Hg, NOx, SO_2, Cd, Pb, and CO. • Limit visible emissions of combustion ash from an ash conveying system to ≤5 percent.
New SSI units: Commenced construction/reconstruction of the unit after October 14, 2010	
Fluidized bed Multiple hearth	• Obtain and maintain operator training and qualification. • Meet emission limits for PM, HCl, dioxins/furans, Hg, NOx, SO_2, Cd, Pb, and CO. • Install and operate CEMS to monitor CO. • Limit visible emissions of combustion ash from an ash conveying system to ≤5 percent.

[1] Fluidized bed incinerator: Enclosed device in which organic and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.
Multiple hearth incinerator: Circular steel furnace that contains a number of solid refractory hearths and a central rotating shaft; rabble arms that are designed to slowly rake the sludge on the hearth are attached to the rotating shaft.
[2] Existing and new FB and MH incinerators must all meet emission limits for the same nine pollutants; however, the numerical emission limits are different for each of the subcategories.

Meet Emission Limits

- Conduct initial performance test and establish operating parameters.
- Repeat performance test every year.
- Monitor and collect data to demonstrate compliance with operating limits.
- Conduct initial and annual inspections of the air pollution control device.
- Continuously monitor the minimum temperature of the combustion chamber.
- Prepare a site-specific monitoring plan for each continuous monitoring system, bag leak detection system, and ash handling system.
- Conduct initial and periodic performance evaluation of each continuous monitoring system, bag leak detection system, and ash handling system.

Do the rules provide flexibility?

- You may install and operate continuous monitoring systems (CEMS) for PM, HCl, dioxins/furans, Hg, NOx, SO_2, Cd, and Pb and CO instead of conducting annual performance tests. New units must install CO CEMS.
- You may install a continuous automated sampling system for Hg and dioxins/furans instead of annual performance testing.
- To demonstrate initial compliance, existing units may use results from a test conducted within 2 previous years, if the test was conducted under the same conditions and no process changes have been made since.
- You may conduct performance tests every third year if performance tests for a pollutant for at least 2 consecutive years show that emissions are at or below 75 percent of the emission limit.

BID REQUIREMENTS / TABULATION

Water Pollution Control
G-4652 Beecher Rd.
Flint, MI 48532

PROVIDE TO WATER POLLUTION CONTROL ALL THE LABOR AND MATERIALS AS SPECIFIED IN THE ATTACHED BID DOCUMENTS TO CONSTRUCT A BIOSOLIDS LOADING FACILTY. ADDITIONAL ITEMS AS REQUESTED.

QUANTITIES (DOLLAR AMOUNTS) ARE NOT GUARANTEED.

FOR FURTHER INFORMATION PLEASE CONTACT ROBERT J. CASE, WPC SUPERVISOR OR JOHN FLORSHINGER, AUTOMATION SUPERVISOR AT (810) 766-7210 EXTENSION 3641.

Only the specifier has the responsibility and judgment for determining whether a proposed substitution is an "or equal or exceeding" specification. Mfg., model #, and supporting documentation of specifications for alternates must be provided.

City of Flint - Water Pollution Control
Solids Handling Improvements – Biosolids Loading Facilities

This project includes the construction of a new Biosolids Loading Building (BLB) and provision of equipment in both the new building and an existing Dewatering Building to enable conveyance and loading of biosolids cake into trucks or large roll-off containers. Major pieces of equipment will be Owner-supplied, such as the conveyance equipment in the new building and the existing dewatering building, and biosolids cake pumps to be used to move the cake from the Dewatering to the BLB.

The existing biosolids dewatering and incineration must be kept functional and in operation during the construction. However, it is only necessary to have one of the two dewatering equipment trains (East or West) operational at one time.

Specifics include all required labor, material, and equipment to perform the work as noted:

1. Installation of two new Owner-supplied progressive cavity cake pumps for dewatered biosolids.

2. Modification of existing conveyor belts.

3. Installation of Owner-supplied new screw conveyors in the Dewatering Building to enable use of any of four dewatering centrifuges or belt filter presses.

4. Installation of a piping system to conduct the biosolids from the Dewatering Building to the new building. Provide all required bonds, insurance, warranties, and guarantees.

5. Construction of a new building to house truck loading equipment for the biosolids.

6. Installation of Owner-supplied new screw conveyors to distribute the cake into containers in the new building.

7. Site improvements to facilitate trucking of the biosolids off plant grounds, including a new automatic gate and minor paving work.

A Pre-Bid meeting will be held at Water Pollution Control on **Thurs., July, 24, 2014** at 10:00 a.m. EST. Attendance is not mandatory, but highly recommended.
Bids are due on **Thurs., August 7, 2014** by 3:00 p.m. EST.

ARTICLE 1 - QUALIFICATIONS OF BIDDERS

Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

To demonstrate Bidder's qualifications to perform the Work, within 3 days of Owner's request, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as may be called for below.

ARTICLE 2 - **BIDDER'S ACKNOWLEDGEMENTS**

Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 120 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 -BIDDER'S REPRESENTATIONS

In submitting this Bid, Bidder represents that Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.	Addendum Date

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE (Subsurface and Physical Conditions)

4.01 The Supplementary Conditions identify

A. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.
B. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
C. Copies of reports and drawings referenced in Paragraphs 4.01.A-B will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.01 has been identified and established in Paragraph 4.02.

D. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown and/or indicated in such drawings/documents.

4.02 Underground Facilities

Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.03Hazardous Environmental Condition

A. The Supplementary Conditions identify any reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.
B. Copies of reports and drawings referenced in Paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.01 of the General Conditions has been identified and established in Paragraph 4.01 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

4.04 Adequacy of Data

Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02 and 4.03 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.03 of the General Conditions.

4.05Site Restoration

On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

REVISED

REQUIREMENT / TABULATION

Bidder herby agrees to complete the Work in accordance with the Contract Documents for the following lump sum price(s):

TASK	GENERAL DESCRIPTION	ESTIMATED TIME TO COMPLETE	COST
1	Installation of two new Owner-supplied progressive cavity cake pumps for dewatered biosolids.		
2	Modification of existing conveyor belts.		
3	Installation of Owner-supplied new screw conveyors in the Dewatering Building.		
4	Installation of a piping system to conduct the biosolids from the dewatering building to the new building.		
5	Construction of a new building to house truck loading equipment for the biosolids.		
6	Installation of Owner-supplied new screw conveyors in the new building.		
7	Site improvements to facilitate trucking of the biosolids off plant grounds, including a new automatic gate and paving work.		
100% Complete	GRAND TOTAL		$
8	DEDUCTIBLE ALTERNATE NO. 1 – Polymer Piping to Solids Loading Building Provide the following deduct from the Base Bid if the Polymer Piping to the Solids Loading Building identified on the DRAWINGS is not constructed:		

All specified cash allowances are included in the price(s) set forth above, and have been computed in accordance with Paragraph 11.02 of the General Conditions.

1. Included in the Bid Price is an Allowance for SCADA programming in the amount of $20,000.00.

2. Included in the Bid Price is an Allowance for Security Cameras in the amount of $15,000.00.

3. Included in the Bid Price is an Allowance for use tax for Owner furnished equipment in the amount of $50,000.00.

4. Included in the Bid Price is an Allowance for Safety/Walkway Modifications in the amount of $15,000.00.

Bidder certifies that:

This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

Bidder has not solicited or induced any individual or entity to refrain from bidding; and

Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph:

A. "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
B. "Fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
C. "Collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
D. "Coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

All BIDS will be evaluated on the following criteria:

1. Failure to use this bid form may result in bid disqualification.
2. Failure to bid on all items may result in an "incomplete bid" determination.
3. List value-added considerations on a separate sheet of paper.

THIS PAGE MUST BE COMPLETED AND INCLUDED WITH SUBMITTAL:

JIM ANANICH
27TH DISTRICT
P.O. BOX 30036
LANSING, MI 48909-7536
PHONE: (517) 373-0142
FAX: (517) 373-3938

THE SENATE
STATE OF MICHIGAN

October 29, 2014

Michigan Department of Treasury
Office of Revenue and Tax Analysis
P.O. Box 30722
Lansing, MI 48909

To Whom It May Concern:

I am pleased to have this opportunity to submit a letter of support for the City of Flint's application to the Michigan Department of Treasury Financially Distressed Cities, Villages, and Townships Grant Program for the ***Water Pollution Control Incinerator Shutdown Project.***

Given the recent water contamination crisis that the City of Flint faced (http://www.washingtontimes.com/news/2014/sep/8/flint-expands-water-advisory-after-bacteria-found/), it is critical that they have adequate resources to update their water infrastructure to avoided repeated contamination cases. This grant would help the City of Flint start that process.

Additionally, the City of Flint needs to implement this project to realize a net $400,000 in annual savings from reduced purchase of natural gas, reduced maintenance and the avoidance of costly federally mandated incinerator upgrades. This savings will strengthen the Sewer Enterprise Fund and provide the capability for necessary investment in the water pollution control infrastructure.

For the above reasons and many more, I want to again express my strong support of this proposal. It is my hope that you give the ***Water Pollution Control Incinerator Shutdown*** proposal strong consideration. If you have any additional questions about this proposal and my reasons for supporting it, please don't hesitate to contact me at my office: (517) 373-0142.

Sincerely,

Jim Ananich
State Senator
27th District
517-373-0142

Recycled Paper

Elowsky, Denise (Treasury)

From: Maxine Murray <mmurray@cityofflint.com>
Sent: Friday, October 31, 2014 4:23 PM
To: TreasRevenueSharing
Subject: Financially Distressed Cities, Villages, and Townships Application - Water Pollution Control Incinerator Shutdown Project
Attachments: WPC Incinerator Shutdown 10312014.pdf

Good afternoon:

Please find attached the Water Pollution Control Incinerator Shutdown Project from the City of Flint.

Thank you.

--
Maxine Murray
Executive Assistant to
Mayor Dayne Walling
Darnell Earley, Emergency Manager
1101 S. Saginaw Street
Flint, MI 48502
810.237.2035 Telephone
810.766.7218 Fax

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, July 01, 2015 8:31 AM
To: Busch, Stephen (DEQ); Benzie, Richard (DEQ); Sygo, Jim (DEQ)
Cc: Shaler, Karen (DEQ); Devereaux, Tracy Jo (DEQ); Monosmith, Carrie (DEQ)
Subject: Fw: Flint

We'll need to discuss after we receive Miguel's report, but before the call later this month.

From: Hyde, Tinka <hyde.tinka@epa.gov>
Sent: Tuesday, June 30, 2015 4:40 PM
To: Shekter Smith, Liane (DEQ)
Cc: Monosmith, Carrie (DEQ); Henry, Timothy; Poy, Thomas; Bair, Rita; Damato, Nicholas
Subject: Flint

Hi Liane – I'm following up on the voicemail I left for you earlier today. I'm also copying Carrie Monosmith as I did get a chance to chat with her. In advance of our call scheduled for 7/21/15, I wanted to provide you with an update related to water quality challenges in Flint. I understand that some discussion occurred on June 10th with Tom Poy and staff during the semi-annual call regarding MDEQ's implementation of the LCR rule and the status of Flint. The Region is concerned about the lead situation in Flint and suggested that additional ORD assistance could be provided to Flint's Advisory Committee. We understand that the city is finishing up its second set of 6-month initial monitoring and I have scheduled a call with you on July 21st so we can discuss the Flint situation in more detail.

As you know, my staff have been out to Flint to collect samples and data which we felt could uniquely inform the NDWAC process and ultimately better inform the LCR rulemaking. Tom Poy asked Miguel Del Toral to prepare a report summarizing the visits and findings. Last week Miguel completed a draft interim report and provided it to management. Once Miguel addresses our comments, we will provide you with a copy of that report. In most cases, an internal EPA memo would not be distributed outside the agency, but given his interaction with the homeowner for one of the sampling locations, Miguel has shared a copy of the draft interim report as a courtesy with this Flint resident. Based on Miguel's initial analysis, elevated lead levels were found at this residence. In addition, it appears that the source of the lead may be from outside the home (Note: plumbing in the home is largely plastic).

Please know that Region 5 management is still being briefed on the lead issues in Flint and we look forward to the opportunity to discuss the situation with you in more detail so we can better characterize what MDEQ is already doing in Flint and how public health protection can best be provided to the citizens of Flint. If you would like to discuss this in advance of our call, please feel free to contact myself, or Tim Henry (312-886-6107). Thanks

Tinka G. Hyde
Water Division Director
USEPA W-15J
77 W. Jackson Blvd
Chicago, IL 60604

Office: 312-886-9296
Cell: 312-735-9428

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, August 28, 2015 1:12 PM
To: Busch, Stephen (DEQ)
Cc: Benzie, Richard (DEQ)
Subject: FW: Flint Citizen Sampling

From: Poy, Thomas [mailto:poy.thomas@epa.gov]
Sent: Friday, August 28, 2015 12:35 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Cc: Hyde, Tinka; Crooks, Jennifer
Subject: Flint Citizen Sampling

Liane/Richard: FYI...Marc Edwards (Virginia Tech) is working with some of the citizens in Flint and they are finding lead at levels above 5 ppb and some above 15 ppb. There's no indication of whether any of these homes were also sampled and analyzed by Flint and will now part of their compliance calculations. Virginia Tech sent out 300 bottles and have gotten 48 back. We are not involved in this effort by Dr. Edwards.

https://flintwaterstudyupdates.wordpress.com/

Tom

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

Rennaker, Joanne (DEQ)

From: Cook, Pat (DEQ)
Sent: Thursday, April 30, 2015 12:15 PM
To: Rosenthal, Adam (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: FW: Flint Corrosion Control?

HI Adam - what is the reporting/detection limit for lead on the CMET2 scan?

From: Cook, Pat (DEQ) <COOKP@michigan.gov>

Sent: Friday, April 24, 2015 12:45 PM
To: Deltoral, Miguel
Subject: RE: Flint Corrosion Control?

Total Lead collected from the plant tap on 5/22/14 was zero.

pat

From: Deltoral, Miguel [mailto:deltoral.miguel@epa.gov]
Sent: Friday, April 24, 2015 11:59 AM
To: Cook, Pat (DEQ)
Cc: Poy, Thomas; Porter, Andrea
Subject: Re: Flint Corrosion Control?

What was the source water lead level?

Miguel A. Del Toral
Regulations Manager
U.S. EPA R5 GWDWB
77 West Jackson Blvd, (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

From: Cook, Pat (DEQ) <COOKP@michigan.gov>
Sent: Friday, April 24, 2015 10:43 AM
To: Deltoral, Miguel
Cc: Poy, Thomas; Porter, Andrea
Subject: RE: Flint Corrosion Control?

Hi Miguel - Flint is currently not practicing corrosion control treatment at the WTP. When they started treating water at their WTP last spring, we placed them on full chart (100 sites) Pb/Cu monitoring for two consecutive 6 month periods. WQ monitoring is also being conducted. The first round of samples after switch-over from DWSD (July 1, 2014 – Dec 31, 2014) had 90th percentiles of 6 ppb for Lead and 110 ppb for Copper. The second round of samples (Jan 1, 2015 – June 30, 2015) is underway with approximately 20 of the 100 sample site results in. The highest lead result out of the 20 received thus far is 13 ppb.

Based on the matrix of recommended corrosion control study components for Large PWS's for both Lead and Copper, there are no additional requirements for the City of Flint based on the levels of lead and copper in the current source water and the results of the lead and copper distribution monitoring. The only provision of the Lead & Copper Rule which classifies the existing treatment of large PWSs as optimized for corrosion control is when the difference between the 90% Pb-TAP and Pb-POE is less than the lead practical quantitative level (PQL) for each six-month period of the initial monitoring program. By definition, the PQL for lead is 0.005 mg/L; and the lead value for the source water used in this determination is the highest source water lead concentration. If this condition is met, then no study or testing is required. We believe this condition has been met for Flint. However, we will re-evaluate this after the 2nd round of 6 month sampling is completed.

If you have any further questions, please contact the Lansing District Supervisor, Steve Busch at (517) 643-2314 or at buschs@michigan.gov.

Have a good (and hopefully warm) weekend!

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

From: Deltoral, Miguel [mailto:deltoral.miguel@epa.gov]
Sent: Thursday, April 23, 2015 12:33 PM
To: Cook, Pat (DEQ)
Cc: Poy, Thomas; Porter, Andrea
Subject: Flint Corrosion Control?

Hi Pat,

What's Flint doing now (post Detroit) for corrosion control treatment?

Miguel A. Del Toral
Regulations Manager
Ground Water and Drinking Water Branch
77 West Jackson Blvd (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

Rennaker, Joanne (DEQ)

From: Cook, Pat (DEQ)
Sent: Friday, April 24, 2015 10:28 AM
To: Prysby, Mike (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint Corrosion Control?

Other than sampling for Pb/Cu, I don't think Flint is doing anything regarding corrosion control. I'm guessing that we are waiting for two rounds of monitoring before we make a determination regarding optimal corrosion control. The fact that they will be switching raw water sources in a year also complicates things.

Let's get together ASAP to discuss our reply to Miguel.

pat

From: Deltoral, Miguel [mailto:deltoral.miguel@epa.gov]
Sent: Thursday, April 23, 2015 12:33 PM
To: Cook, Pat (DEQ)
Cc: Poy, Thomas; Porter, Andrea
Subject: Flint Corrosion Control?

Hi Pat,

What's Flint doing now (post Detroit) for corrosion control treatment?

Miguel A. Del Toral
Regulations Manager
Ground Water and Drinking Water Branch
77 West Jackson Blvd (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

Rennaker, Joanne (DEQ)

From: Cook, Pat (DEQ)
Sent: Tuesday, April 28, 2015 9:09 AM
To: Benzie, Richard (DEQ); Philip, Kris (DEQ)
Cc: Busch, Stephen (DEQ)
Subject: FW: Flint Corrosion Control?

I think you should be aware of this. Steve and I will respond to Miguel later in the week regarding his 4-25-15 email.

pat

From: Cook, Pat (DEQ)
Sent: Monday, April 27, 2015 9:35 AM
To: Busch, Stephen (DEQ)
Cc: Prysby, Mike (DEQ)
Subject: RE: Flint Corrosion Control?

Hi Steve – I agree, the constant second guessing of how we interpret and implement our rules is getting tiresome. I think what Miguel is saying is that since Flint did not comply with "optimal" criteria stated below (Rule 604(f)(2)(b)(D)(iii) in Act 399) in the first 6 month monitoring period, they cannot meet it for two consecutive 6 month periods that is required. However, we have always waited for 2 rounds of results before making that decision.

Any ways, when you have a minute please give me a call so we can figure out how to respond to Miguel.

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

From: Busch, Stephen (DEQ)
Sent: Monday, April 27, 2015 8:27 AM
To: Cook, Pat (DEQ)
Cc: Prysby, Mike (DEQ)
Subject: RE: Flint Corrosion Control?

He continues to base his concern on a single location which has/had a lead service line and "pre-flushing" concerns which are not part of the current regulations.

Flint is now below the criteria for a large system. Technically they don't have to do any of this.

Flint has also only been through one round of lead copper sample not the two rounds needed to make the determination he lists below.

If he continues to persist we may need Liane or Director Wyant to make a call to EPA to help address his over-reaches.

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: Monday, April 27, 2015 7:59 AM
To: Busch, Stephen (DEQ)
Cc: Prysby, Mike (DEQ)
Subject: FW: Flint Corrosion Control?

Hi Steve and Mike - I knew this was going to happen. Miguel is questioning that Flint is in compliance with optimal corrosion control. Please read the below email and let me know what you think. While it's not a big hurry at this time since Miguel is out till next week, we eventually will have to respond to him.

pat

From: Deltoral, Miguel [mailto:deltoral.miguel@epa.gov]
Sent: Saturday, April 25, 2015 10:11 AM
To: Cook, Pat (DEQ)
Cc: Porter, Andrea; Crooks, Jennifer; Poy, Thomas
Subject: Re: Flint Corrosion Control?

Hi Pat,

I'll be heading out to MI for RTCR tomorrow and won't see email until next Tuesday, but I wanted to follow up on this because Flint has essentially not been using any corrosion control treatment since April 30, 2014 and they have LSLs. Given the very high lead levels found at one home and the pre-flushing happening at Flint, I'm worried that the whole town may have much higher lead levels than the compliance results indicated, since they are using pre-flushing ahead of their compliance sampling.

If the source water lead is non-detect (zero), then according to 141.89(a)(3) they should use zero for that source water value:

"All lead and copper levels measured between the PQL and MDL must be either reported as measured or they can be reported as one-half the PQL specified for lead and copper in paragraph (a)(1)(ii) of this section. All levels below the lead and copper MDLs must be reported as zero."

As far as the treatment determination, there are only two scenarios for a large system to be deemed to have optimized corrosion control without treatment and Flint does not appear to meet either:

The first is at 141.81(b)(3)

Any water system is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with § 141.86 and source water monitoring conducted in accordance with § 141.88 that demonstrates for two consecutive 6-month monitoring periods that the difference between the 90th

percentile tap water lead level computed under §141.80(c)(3), and the highest source water lead concentration is less than the Practical Quantitation Level for lead specified in § 141.89(a)(1)(ii).

If Flint's highest source water lead was zero, and their 90th percentile was 0.006, then Flint does not meet this criteria, because the difference must be LESS THAN the PQL (i.e., 0.004 or less). 0.006 - 0 = 0.006.

The second is at 141.81(b)(3)(i):

Those systems whose highest source water lead level is below the Method Detection Limit may also be deemed to have optimized corrosion control under this paragraph if the 90th percentile tap water lead level is less than or equal to the Practical Quantitation Level for lead for two consecutive 6-month monitoring periods.

Although Flint's source water lead was non-detect (zero), the 90th percentile lead level is 0.006 which is above the PQL of 0.005, so Flint would not meet this criteria either.

Am I missing something?

Miguel A. Del Toral
Regulations Manager
U.S. EPA R5 GWDWB
77 West Jackson Blvd, (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

From: Cook, Pat (DEQ) <COOKP@michigan.gov>
Sent: Friday, April 24, 2015 12:45 PM
To: Deltoral, Miguel
Subject: RE: Flint Corrosion Control?

Total Lead collected from the plant tap on 5/22/14 was zero.

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Sent: Friday, April 24, 2015 11:59 AM
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Cc: Poy, Thomas; Porter, Andrea
Subject: Re: Flint Corrosion Control?

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Miguel A. Del Toral
Regulations Manager
U.S. EPA R5 GWDWB
77 West Jackson Blvd, (WG-15J)

Chicago, IL 60604
Phone: (312) 886-5253

From: Cook, Pat (DEQ) <COOKP@michigan.gov>
Sent: Friday, April 24, 2015 10:43 AM
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If you have any further questions, please contact the Lansing District Supervisor, Steve Busch at (517) 643-2314 or at buschs@michigan.gov.

Have a good (and hopefully warm) weekend!

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

From: Deltoral, Miguel [mailto:deltoral.miguel@epa.gov]
Sent: Thursday, April 23, 2015 12:33 PM
To: Cook, Pat (DEQ)
Cc: Poy, Thomas; Porter, Andrea
Subject: Flint Corrosion Control?

Hi Pat,

What's Flint doing now (post Detroit) for corrosion control treatment?

Miguel A. Del Toral
Regulations Manager
Ground Water and Drinking Water Branch
77 West Jackson Blvd (WG-15J)

Chicago, IL 60604
Phone: (312) 886-5253

Rennaker, Joanne (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Tuesday, July 28, 2015 11:14 AM
To: Scherbarth, John (AG)
Cc: Busch, Stephen (DEQ); Prysby, Mike (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation - 2nd quarter 2015
Attachments: Flint VN TTHM 6_9_15.pdf

John, the April 3rd letter was for a different rule and not a violation letter. The attached is the latest violation notice regarding the disinfection byproduct MCL.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

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

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, *MCL*s, 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.

TTHM Results (mg/L)						
	8/21/14	11/20/14	2/17/15	5/18/15	LRAA	OEL
DBP1 McDonalds 3719 Davison	**0.145**	0.059	0.0162	0.0514	0.068	0.044
DBP2 Liquor Palace 3302 South Dort Highway	**0.127**	0.033	0.0168	0.0635	0.060	0.044
DBP3 North Flint Auto 6204 North Saginaw St.	**0.118**	0.041	0.0149	0.0452	0.055	0.037
DBP4 University Market 2501 Flushing Road	**0.196**	**0.094**	0.0245	0.0598	**0.094**	0.059
DBP5 Taco Bell 3606 Corunna Road	**0.181**	0.034	0.0151	0.0547	0.072	0.040
DBP6 Rite-Aid Pharmacy 5018 Clio Road	**0.144**	0.054	0.0192	0.0605	0.069	0.048
DBP7 Salem Housing 3216 MLK Boulevard	**0.112**	0.050	0.0285	0.0727	0.066	0.056
DBP8 BP Gas Station 822 South Dort Highway	**0.112**	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 325.10719l, *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.

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 Glascow, 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 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 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.

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 Department of Environmental Quality.

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Wednesday, December 17, 2014 5:12 PM
To: Byrne, Randall (Treasury)
Cc: Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint Drinking Water TTHM Standard Violation
Attachments: City of Flint VN - MCL TTHM 12_16_14.pdf

Randy –

FYI - Attached is the letter we sent to the city of Flint earlier this week.

Liane

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: Tuesday, December 16, 2014 10:17 AM
To: Datema, Maggie (DEQ); Wurfel, Brad (DEQ)
Cc: Prysby, Mike (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ)
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

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

RICK SNYDER
GOVERNOR

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
4th 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 R325.10719l, *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 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 3719 Davison	**0.162**	**0.145**	0.059	**0.092**	**0.106**
DBP2 Liquor Palace 3302 S. Dort Highway	**0.112**	**0.127**	0.033	0.068	0.076
DBP3 North Flint Auto 6204 N. Saginaw St.	**0.097**	**0.118**	0.041	0.064	0.074
DBP4 University Market 2501 Flushing Road	**0.106**	**0.196**	**0.094**	**0.099**	**0.122**
DBP5 Taco Bell 3606 Corunna Road	0.079	**0.181**	0.034	0.074	**0.082**
DBP6 Rite-Aid Pharmacy 5018 Clio Road	**0.088**	**0.144**	0.054	0.072	**0.085**
DBP7 Salem Housing 3216 MLK Boulevard	**0.082**	**0.112**	0.050	0.061	0.074
DBP8 BP Gas Station 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 719l (R325.10719l) 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 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 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: Datema, Maggie (DEQ)
Sent: Tuesday, December 16, 2014 10:37 AM
To: senjananich@senate.michigan.gov; woodrowstanley@house.mi.gov; repphelps@house.mi.gov
Cc: Busch, Stephen (DEQ); Howes, Sarah (DEQ); DEQ-Legislative-Contact
Subject: FW: Flint Drinking Water TTHM Standard Violation
Attachments: City of Flint VN - MCL TTHM 12_16_14.pdf

Senator Ananich and Representatives Stanley and Phelps,

Today the DEQ will be issuing a violation notice to the City of Flint for exceedances in the Maximum Containment Level standard for Total Trihalomethanes within the City's water distribution system. I am providing you this information as a courtesy head's up in case you get any calls from constituents.
The DEQ has been actively working with the City to resolve this issue and has seen progress in getting these levels under control. We will continue to work with the City to implement additional management practices and protocols to better manage the exceedances of this drinking water standard.

If you have any questions, please contact Steve Busch, whose contact info is listed below.

Thank you,
Maggie

Maggie Datema
Director of Legislative Affairs
Michigan Department of Environmental Quality
517-599-6190
DatemaM@michigan.gov

From: Busch, Stephen (DEQ)
Sent: Tuesday, December 16, 2014 10:17 AM
To: Datema, Maggie (DEQ); Wurfel, Brad (DEQ)
Cc: Prysby, Mike (DEQ); Benzie, Richard (DEQ); Shekter Smith, Liane (DEQ); Rosenthal, Adam (DEQ)
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.

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

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING DISTRICT OFFICE

RICK SNYDER
GOVERNOR

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
4th 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 R325.10719l, *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 four of the City's eight sample site locations.

TTHM Results (mg/L)					
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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 719l (R325.10719l) 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.

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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

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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 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 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: Prysby, Mike (DEQ)
Sent: Friday, October 02, 2015 9:16 AM
To: Busch, Stephen (DEQ)
Subject: FW: Flint Elementary School water supply lines
Attachments: School water supply lines.xls; School water supply lines.xls

Steve,

See updated school list.

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

From: Robert Bincsik [mailto:rbincsik@cityofflint.com]
Sent: Thursday, October 01, 2015 5:22 PM
To: Prysby, Mike (DEQ)
Subject: Fwd: Flint Elementary School water supply lines

---------- Forwarded message ----------
From: **Alan Roberts** <aroberts@cityofflint.com>
Date: Thu, Oct 1, 2015 at 12:37 PM
Subject: Fwd: Flint Elementary School water supply lines
To: Robert Bincsik <rbincsik@cityofflint.com>

Rob,

Here is the spreadsheet updated with the Northwestern, Southwestern, Admin building and food service facility information.

Cordially,

Alan Roberts

---------- Forwarded message ----------
From: **Alan Roberts** <aroberts@cityofflint.com>
Date: Wed, Sep 30, 2015 at 3:03 PM
Subject: Flint Elementary School water supply lines
To: Robert Bincsik <rbincsik@cityofflint.com>

Rob,

Per your instructions, please find attached a spreadsheet of data for the listing of selected schools you provided.

Also, see the link for the Google map.

Cordially,

Alan Roberts

--

Thank you,

Robert Bincsik
Water Service Center Supervisor
City of Flint
3310 E. Court Street
Flint, MI 48506
Ph: 810.766.7202 ext. 3413
Fx: 810.743.5758

Row #	School Name	Street Address	Supply line size, inches
1	Brownell K2 Stem Academy	6302 Oxley Dr., Flint, MI 48504	4
2	Doyle Ryder Elementary School	1040 N. Saginaw St., Flint, MI 48503	4
3	Durant-Tuuri-Mott Elementary School	1518 University Ave., Flint, MI 48504	6
4	Eisenhower Elementary School	1235 Pershing St., Flint, MI 48503	4
5	Freeman Elementary School	4001 Ogema Ave., Flint, MI 48507	4
6	Holmes 3-6 Stem Academy	6602 Oxley Dr., Flint, MI 48504	6
7	Neithercut Elementary School	2010 Crestbrook Ln., Flint, MI 48507	4
8	Pierce Elementary School	1101 W. Vernon Dr., Flint, MI 48503	(n/a)
9	Potter Elementary School	2500 N. Averill Ave., Flint, MI 48506	4
10	Northridge Academy	530 W. Pierson Rd., Flint, MI 48505	4
11	International Academy of Flint	2820 S. Saginaw St., 48503	4
12	Richfield Public School Academy	3807 N. Center Rd., Flint, MI 48506	2
13	Powers Catholic High School	1505 W. Court St., Flint, MI 48503	8
14	Michigan School for the Deaf	1235 W. Court St., Flint, MI 48503	8
15	Mott Middle College High School	1401 E. Court St., Flint, MI 48503	8

Supply line material	Map page	Street name	house no.	Notes
cast iron	D-2 mains	Oxley Dr.	6302	
cast iron	H-10 mains	N. Saginaw St.	1040	
cast iron	F-12 mains	University Ave.	1518	
cast iron	F-14 mains	Pershing St.	1235	
cast iron	K-17 mains	Ogema Ave.	4001	
cast iron	D-2 mains	Oxley Dr.	6602	
cast iron	F-17 mains	Crestbrook Ln.	2010	
(n/a)	K-12 mains	W. Vernon Dr.	1101	only the 8 inch fire line noted on dwg.
cast iron	M-8 mains	N. Averill Ave.	2500	
cast iron	F-4 mains	W. Pierson Rd.	530	noted on dwg as St. Agnes Church and School
cast iron	I-15 mains	S. Saginaw St.	2820	noted on dwg as Lincoln School
copper	N-6 curb box	N. Center Rd.	3807	
cast iron	F-14 mains	W. Court St.	1505	Also see G-14 mains
cast iron	F-14 mains	W. Court St.	1235	Also see G-14 mains
ductile iron	J-11 mains	E. Court St.	1401	noted on dwg as "Student Center"

Row #	School Name	Street Address	Supply line size, inches
1	Brownell K2 Stem Academy	6302 Oxley Dr., Flint, MI 48504	4
2	Doyle Ryder Elementary School	1040 N. Saginaw St., Flint, MI 48503	4
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5	Freeman Elementary School	4001 Ogema Ave., Flint, MI 48507	4
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13	Powers Catholic High School	1505 W. Court St., Flint, MI 48503	8
14	Michigan School for the Deaf	1235 W. Court St., Flint, MI 48503	8
15	Mott Middle College High School	1401 E. Court St., Flint, MI 48503	8
16	Northwestern High School	2138 W. Carpenter Rd.	8
17	Southwestern High School	1420 W. Twelfth St.	6
18	Flint City Schools Admin Building	923 E. Kearsley St.	4
19	Main Kitchen - Flint Schools	305 Walnut St.	2

Supply line material	Map page	Street name	house no.	Notes
cast iron	D-2 mains	Oxley Dr.	6302	
cast iron	H-10 mains	N. Saginaw St.	1040	
cast iron	F-12 mains	University Ave.	1518	
cast iron	F-14 mains	Pershing St.	1235	
cast iron	K-17 mains	Ogema Ave.	4001	
cast iron	D-2 mains	Oxley Dr.	6602	
cast iron	F-17 mains	Crestbrook Ln.	2010	
(n/a)	K-12 mains	W. Vernon Dr.	1101	only the 8 inch fire line noted on dwg.
cast iron	M-8 mains	N. Averill Ave.	2500	
cast iron	F-4 mains	W. Pierson Rd.	530	noted on dwg as St. Agnes Church and School
cast iron	I-15 mains	S. Saginaw St.	2820	noted on dwg as Lincoln School
copper	N-6 curb box	N. Center Rd.	3807	
cast iron	F-14 mains	W. Court St.	1505	Also see G-14 mains
cast iron	F-14 mains	W. Court St.	1235	Also see G-14 mains
ductile iron	J-11 mains	E. Court St.	1401	noted on dwg as "Student Center"
ductile iron	E-1 mains	W. Carpenter Rd.	2138	
ductile iron	G-15 mains	W. Twelfth St.	1420	
cast iron	I-11	E. Kearsley St.	923	
copper	J-10 curb box	Walnut St.	305	

Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Thursday, May 21, 2015 4:11 PM
To: Busch, Stephen (DEQ)
Subject: FW: Flint Filter Media Change to GAC
Attachments: GAC-basis-of-design.pdf

Steve,

Below is Jeff's message regarding the use of GAC (Filtrasorb series) at some of our WTPs in Michigan.

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

From: Hansen, Jeff [mailto:jrhansen@lan-inc.com]
Sent: Wednesday, May 20, 2015 11:20 AM
To: Prysby, Mike (DEQ)
Cc: Matta, Samir; Green, Warren; Brent Wright (bwright@cityofflint.com); mglasgow@cityofflint.com
Subject: Flint Filter Media Change to GAC

Hi Mike,

Attached is our preliminary basis of design. We are currently working through details with GAC suppliers to determine the best specific media for Flint, but the Filtrasorb 300 and 400 series from Calgon or equivalent appear to be the best suited. Please note that both meet AWWA B604, but are questionable by Ten States Standards (TSS) as TSS are non-specific for GAC capping. According to Calgon, their Filtrasorb product has been approved by DEQ at numerous plants including Ann Arbor, Grosse Pointe Farms, Manistique, and Alpena.

Also note we intend to add a chlorine feed point following filtration while maintaining the intermediate feed point, with valving, so chlorine can be added at either point. The intermediate feed point prior to filtration can then be used as a means of disinfecting the filters in the future, if necessary.

Jeffrey R. Hansen
Senior Project Manager

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
1311 South Linden Road, Suite B • Flint, MI 48532
T 810.820.2682 **C** 810.333.3201
www.lan-inc.com • JRHansen@lan-inc.com

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CITY OF FLINT WTP
Filter Media Replacement
Basis of Design

					Notes
Max. Expected Flow Rate =	30.0 mgd =		20,833 gpm =	2,785 cft/min	
Max. Day May 2014 - April 2015 =	25.4 mgd =		17,639 gpm =	2,358 cft/min	
Avg. Day May 2014 - April 2015 =	18.3 mgd =		12,708 gpm =	1,699 cft/min	
Design Flow Rate =	24.0 mgd =		16,667 gpm =	2,228 cft/min	
Min. Expected Flow Rate =	8.0 mgd =		5,556 gpm =	743 cft/min	
Area / Filter =	700 sft				
Number of Filters =	12				

mgd	30.0	24.0	8.0
Loading (gpm/sft) =	2.48	1.98	0.66

Top of Underdrain elev =	723.58			
Washwater Trough Weir elev =	730.67			
Operating Water Level =	734.00			
Top of Filter Basin / Floor elev =	736.00			
Filter BW Dimensional D =	7.08			
Existing Sand D =	12.00 inches =		1.00 ft	
Existing Anthracite D =	18.00 inches =		1.50 ft	
Proposed Sand D =	12.00 inches =		1.00 ft	
Proposed GAC D =	18.00 inches =		1.50 ft	See following pages for details
Proposed Water Depth =			7.92 ft	
Max Cold BW Flow rate / filter =	9800 gpm =		14.0 gpm/sft	To match current BW flow rate
Max Warm BW Flow rate / filter =	14000 gpm =		20.0 gpm/sft	Use when water temp > 65 degrees
Max Sand Expanded D =	14.2 inches =		1.18 ft =	18% Occurs at cold temps
Max GAC Expanded D =	34.20 inches =		2.85 ft =	90%
Total BW Expanded D =	48.40 inches =		4.03 ft	
Proposed BW Freeboard =			3.05 ft	
Proposed # of Filters to Replace	12			
GAC Volume =	12,600 cft			
GAC apparent density =	33.7 lbs/cft			
GAC Total Weight =	424,620 lbs =		212.3 tons	

mgd	30.0	24.0	8.0
EBCT (min) =	4.5	5.7	17.0

Propose to relocate intermediate chlorine feed to inlet side of weir chamber following filtration
Intermediate CL2 feed point to remain in place as means to disinfect filters in the future, if needed

mgd	30.0	24.0	8.0	
Contact time (min) =	55.0	68.8	206.3	
CT =	99.0	123.8	371.4	Calculations attached separately

Required CT at 1.8 mg/l chlorine, less than 0.5 degrees C, and pH of 8.0 = 56 OK

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation

Filter Media Analysis 2015 1st Stage

Date: 05/20/15

By: JRH

Data Entry:

WATER INPUT DATA	
Backwash Rate (gpm/sf)	14.0
Water Temperature (F°)	32
Viscosity (centipoise)	1.79355
Dynamic Viscosity (# -sec/sf)	3.746E-05
Water Density (#/cf)	62.42
Mass Density (# -sec/ft^4)	1.940

COMMENTS

SITE LOCATION	10 States		10 States Interpreted		Filtrasorb 400		Filtrasorb 300		Alt	
Media Type	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC
Bed Depth (in)	12	18	12	18	12	18	12	18	12	18
Uniformity Coefficient	2.30	1.65	2.30	1.40	2.30	1.90	2.30	2.10	2.30	1.50
Effective Size (mm)	0.400	0.550	0.40	0.800	0.40	0.650	0.40	0.800	0.40	0.650
d60% Size (mm)	0.920	0.908	0.920	1.120	0.920	1.235	0.920	1.680	0.920	0.975
d90% Size (mm)	1.607	1.269	1.607	1.403	1.607	1.899	1.607	2.762	1.607	1.279
Porosity	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50
Specific Gravity	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45
Media Density (#/cf)	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.13	7.03	3.74	7.03	6.55	7.03	2.43
Reynolds Number	2.447	0.734	2.447	1.329	2.447	1.750	2.447	4.168	2.447	0.899
Correction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Min. Fluidization Rate (gpm/sf)	7.03	2.14	7.03	3.13	7.03	3.74	7.03	6.55	7.03	2.43
Unhindered Settling Vel. (ft/sec)	20.68	6.20	20.68	11.23	20.68	14.79	20.68	35.22	20.68	7.59
Expansion Coefficient (n)	3.287	3.708	3.287	3.494	3.287	3.399	3.287	3.117	3.287	3.633
Bed Porosity Coefficient (k)	142.82	27.92	142.82	35.31	142.82	39.49	142.82	56.85	142.82	30.22
Porosity (expanded)	0.493	0.830	0.493	0.767	0.493	0.737	0.493	0.638	0.493	0.809
Bed Depth Expanded (in)	14.2	53.0	14.2	38.7	14.2	34.2	14.2	24.9	14.2	47.2
% Expanded Bed	18.4	194.4	18.4	115.0	18.4	90.1	18.4	38.1	18.4	162.0
d90gac/d10s Ratio	3.173		3.508		4.746		6.905		3.198	
Discussion/Notes										

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

CITY OF FLINT- DEPARTMENT OF PUBLIC UTILITIES

GAC Filter Evaluation
Filter Media Analysis 2015 1st Stage

Date: 05/20/15
By: JRH
Data Entry:

WATER INPUT DATA	
Backwash Rate (gpm/sf)	20.0
Water Temperature (F°)	80
Viscosity (centipoise)	0.86134
Dynamic Viscosity (# -sec/sf)	1.799E-05
Water Density (#/cf)	62.22
Mass Density (# -sec/ft^4)	1.927

COMMENTS

SITE LOCATION	10 States		10 States Interpreted		Filtrasorb 400		Filtrasorb 300		Alt	
Media Type	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC	Ex. Sand	GAC
Bed Depth (in)	12	18	12	18	12	18	12	18	12	18
Uniformity Coefficient	2.30	1.65	2.30	1.40	2.30	1.90	2.30	2.10	2.30	1.50
Effective Size (mm)	0.400	0.550	0.400	0.800	0.400	0.650	0.400	0.800	0.400	0.650
d60% Size (mm)	0.920	0.908	0.920	1.120	0.920	1.235	0.920	1.680	0.920	0.975
d90% Size (mm)	1.607	1.269	1.607	1.403	1.607	1.899	1.607	2.762	1.607	1.279
Porosity	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50	0.40	0.50
Specific Gravity	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45	2.554	1.45
Media Density (#/cf)	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5	159.4	90.5
Min. Fluidization Rate (gpm/sf)	13.38	4.09	13.38	6.00	13.38	7.16	13.38	12.54	13.38	4.66
Reynolds Number	9.640	2.905	9.640	5.259	9.640	6.928	9.640	16.499	9.640	3.557
Correction Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.828	1.000	1.000
Min. Fluidization Rate (gpm/sf)	13.38	4.09	13.38	6.00	13.38	7.16	13.38	10.39	13.38	4.66
Unhindered Settling Vel. (ft/sec)	81.46	24.55	81.46	44.44	81.46	58.54	81.46	139.42	81.46	30.06
Expansion Coefficient (n)	2.866	3.231	2.866	3.045	2.866	2.962	2.866	2.716	2.866	3.166
Bed Porosity Coefficient (k)	184.94	38.40	184.94	49.50	184.94	55.84	184.94	68.25	184.94	41.83
Porosity (expanded)	0.460	0.817	0.460	0.743	0.460	0.707	0.460	0.636	0.460	0.792
Bed Depth Expanded (in)	13.3	49.2	13.3	35.0	13.3	30.7	13.3	24.8	13.3	43.3
% Expanded Bed	11.2	173.5	11.2	94.3	11.2	70.7	11.2	37.5	11.2	140.5
d90gac/d10s Ratio	3.173		3.508		4.746		6.905		3.198	
Discussion/Notes										

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

CITY OF FLINT WTP

CT CALCS

TIME FROM FILTERS EFFLUENT TO 1ST TAP

Label	Location	Diameter in	Diameter ft	L ft	W ft	D ft	Bottom elev	Vol cft	Flow Rate mgd	Flow Rate cft/s	Baffle Factor	Time min	Velocity fps	Flow Rate mgd	Flow Rate cft/s	Time min	Flow Rate mgd	Flow Rate cft/s	Time min
A	Weir chamber, pre-baffle			26.75	13.08	15.5	709.00	5423	30.0	46.4	1.0	1.95	0.23	24.0	37.1	2.43	8.0	12.4	7.30
B	Weir chamber, post-baffle			26.75	8.5	10.0	709.00	2274	30.0	46.4	1.0	0.82	0.55	24.0	37.1	1.02	8.0	12.4	3.06
	Effluent pipe																		
C	wc - bldg face	48	4.00	16.00				201	30.0	46.4	1.0	0.07	3.69	24.0	37.1	0.09	8.0	12.4	0.27
D	bldg face - junct well	48	4.00	401.00				5039	30.0	46.4	1.0	1.81	3.69	24.0	37.1	2.26	8.0	12.4	6.79
	Res. 3																		
E	Junct well			12.00	18.00	15.0	704.00	3240	30.0	46.4	1.0	1.16	0.17	24.0	37.1	1.45	8.0	12.4	4.36
F	Clear well			140.00	177	10.0	709.00	247,800	30.0	46.4	0.5	44.49	0.05	24.0	37.1	55.61	8.0	12.4	166.83
G	Transfer chamber			7.00	55.25	15.0	704.00	5,801	30.0	46.4	1.0	2.08	0.06	24.0	37.1	2.60	8.0	12.4	7.81
H	Suction well			9.00	25.75	15.0	704.00	3,476	30.0	46.4	1.0	1.25	0.12	24.0	37.1	1.56	8.0	12.4	4.68
	Pump																		
I	Suction pipe	36	3.00	12.00				85	30.0	46.4	1.0	0.03	6.57	24.0	37.1	0.04	8.0	12.4	0.11
J	Discharge pipe	30	2.50	20.00				98	30.0	46.4	1.0	0.04	9.46	24.0	37.1	0.04	8.0	12.4	0.13
K	Dis. pipe (to bldg face)	42	3.50	34.00				327	30.0	46.4	1.0	0.12	4.82	24.0	37.1	0.15	8.0	12.4	0.44
	Finish main 1																		
L1	bldg face - 1st tee	42	3.50	208.00				2001	30.0	46.4	1.0	0.72	4.82	24.0	37.1	0.90	8.0	12.4	2.69
M1	tee - WTP tap	42	3.50	223.00				2146	30.0	46.4	1.0	0.77	4.82	24.0	37.1	0.96	8.0	12.4	2.89
N1	WTP tap - bldg face	12	1.00	19.00				15	30.0	46.4	1.0	0.005	59.10	24.0	37.1	0.01	8.0	12.4	0.02
	Subtotal											1.49				1.87			5.60
	Finish main 2																		
L2	bldg face - 1st tee	42	3.50	73.00				702	30.0	46.4	1.0	0.25	4.82	24.0	37.1	0.32	8.0	12.4	0.95
M2	tee - 1st split	42	3.50	277.00				2665	30.0	46.4	1.0	0.96	4.82	24.0	37.1	1.20	8.0	12.4	3.59
	Subtotal											1.21				1.51			4.53
								Total CT time	@ 36 mgd =			55.0		@ 24 mgd =		68.8	@ 12 mgd =		206.3

	2014								2015							
Month	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr		Min	Avg	Max
Cl2	5.0	4.7	3.9	3.3	3.1	2.5	2.0	1.8	1.8	2.1	2.4	2.0		1.8	2.9	5.0
pH	7.37	7.48	7.62	7.78	7.82	7.71	7.87	8.07	7.74	7.84	7.89	7.83		7.4	7.8	8.1
Flow (mgd)	30.0	24.0	8.0													
CT =	99.0	123.8	371.4													

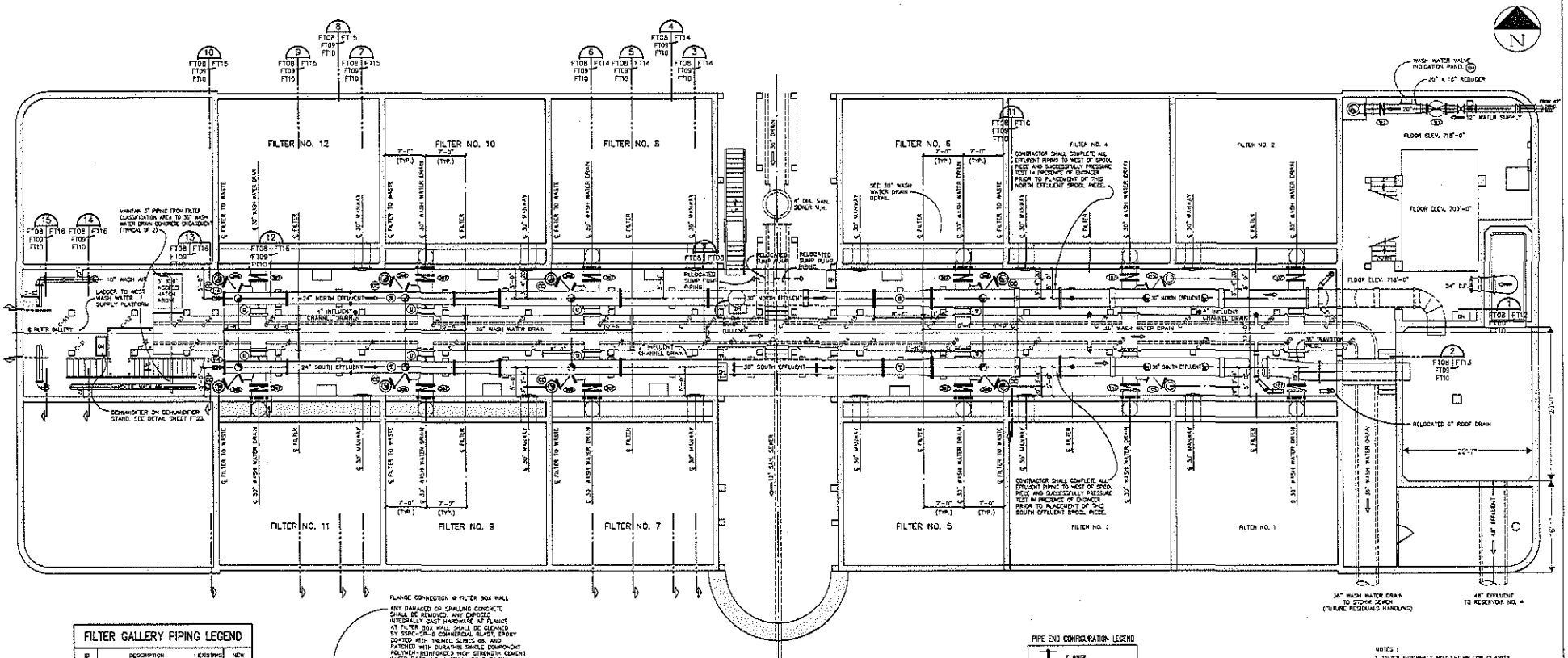
Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

Table C-1. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 0.5°C or Lower

CHLORINE CONCENTRATION	pH<=6 Log Inactivation						pH=6.5 Log Inactivation						pH=7.0 Log Inactivation						pH=7.5 Log Inactivation					
(mg/L)	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
<=0.4	23	46	69	91	114	137	27	54	82	109	136	163	33	65	98	130	163	195	40	79	119	158	198	237
0.6	24	47	71	94	118	141	28	56	84	112	140	169	33	67	100	133	167	200	40	80	120	159	199	239
0.8	24	48	73	97	121	145	29	57	86	115	143	172	34	68	103	137	171	205	41	82	123	164	205	246
1	25	49	74	99	123	148	29	59	88	117	147	176	35	70	105	140	175	210	42	84	127	169	211	253
1.2	25	51	76	101	127	152	30	60	90	120	150	180	36	72	108	143	179	215	43	86	130	173	216	259
1.4	26	52	78	103	129	155	31	61	92	123	153	184	37	74	111	147	184	221	44	89	133	177	222	266
1.6	26	52	79	105	131	157	32	63	95	126	155	189	38	75	113	151	188	226	46	91	137	182	228	273
1.8	27	54	81	108	135	162	32	64	97	129	161	193	39	77	116	154	193	231	47	93	140	186	233	279
2	28	55	83	110	138	165	33	66	99	131	164	197	39	79	118	157	197	236	48	95	143	191	238	286
2.2	28	56	85	113	141	169	34	67	101	134	169	201	40	81	121	161	202	242	50	99	149	198	248	297
2.4	29	57	86	115	143	172	34	68	103	137	171	205	41	82	124	165	206	247	50	99	149	199	248	298
2.6	29	58	88	117	146	175	35	70	105	139	174	209	42	84	126	168	210	252	51	101	152	203	253	304
2.8	30	59	89	119	148	178	36	71	107	142	178	213	43	86	129	171	214	257	52	103	155	207	258	310
3	30	60	91	121	151	181	36	72	109	145	181	217	44	87	131	174	218	261	53	105	158	211	263	316

CHLORINE CONCENTRATION	pH=8.0 Log Inactivation						pH=8.5 Log Inactivation						pH=9.0 Log Inactivation					
(mg/L)	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
<=0.4	46	92	139	185	231	277	55	110	165	219	274	329	65	130	195	260	325	390
0.6	48	95	143	191	238	286	57	114	171	228	285	342	68	136	204	271	339	407
0.8	49	98	148	197	246	295	59	113	177	236	295	354	70	141	211	281	352	422
1	51	101	152	203	253	304	61	122	183	243	304	365	73	146	219	291	364	437
1.2	52	104	157	209	261	313	63	125	188	251	313	376	75	150	226	301	376	451
1.4	54	107	161	214	268	321	65	129	194	258	323	387	77	155	232	309	387	464
1.6	55	110	165	219	274	329	66	132	199	265	331	397	80	159	239	318	398	477
1.8	56	113	169	225	282	338	68	136	204	271	339	407	82	163	245	326	408	489
2	55	115	173	231	288	346	70	139	209	278	348	417	83	167	250	333	417	500
2.2	59	118	177	235	294	353	71	142	213	284	355	426	85	170	256	341	426	511
2.4	60	120	181	241	301	361	73	145	218	290	363	435	87	174	261	348	435	522
2.6	61	123	184	245	307	368	74	148	222	296	370	444	89	178	267	355	444	533
2.8	63	125	188	250	313	375	75	151	226	301	377	452	91	181	272	362	453	543
3	64	127	191	255	318	382	77	153	230	307	383	460	92	184	276	369	460	552

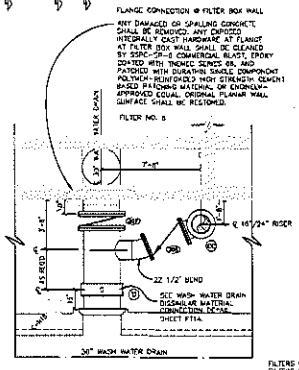
Source: AWWA, 1991.



FILTER PLAN — EL. 720'-0"

SCALE : 1/8" = 1'-0"

FILTER GALLERY PIPING LEGEND			
ID	DESCRIPTION	EXISTING	NEW
P	WASH WATER SUPPLY - GALLERY SERVING FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
Q	REMOVED FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	NO
R	EFFLUENT FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
S	NORTH EFFLUENT	YES	YES
T	SOUTH EFFLUENT	YES	YES
U	WASH WATER DRAIN FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
V	INFLUENT FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	YES
W	SURFACE WASH FILTERS NO. 5 – NO. 12, INCLUSIVE	YES	NO
XC	PLANT WATER AND SURFACE WASH	YES	NO
AA	WASH AIR SUPPLY – GALLERY	YES	NO
BB	WASH AIR SUPPLY FILTERS NO. 5 – NO. 12, INCLUSIVE	NO	YES
CC	FILTER TO WASTE SERVING FILTERS NO. 5 – NO. 12, INCLUSIVE	NO	YES
DD	PROCESS WATER	NO	YES
EE	WASH WATER SUPPLY – WEST	NO	YES



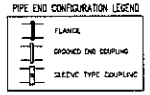
30" WASH WATER DRAIN DETAIL

SCALE : 1/4" = 1'-0"

EXISTING CAST IRON WASH WATER DRAIN DISTANCE FROM FILTER BOX WALL TO FLANGE/ FLANGE FACE	
FILTER NO.	DISTANCE "D"
5	6.0"±
6	10"±
7	8.5"±
8	8.5"±
9	6.0"±
10	8"±
11	9.75"±
12	9.5"±

FILTERS NO. 7, 9, & 11 SIMILAR.
FILTERS NO. 5, 8, 10, & 12 OPPOSITE HAND.

PIPE END CONFIGURATION LEGEND



NOTES :
1. FILTER INTERNALS NOT SHOWN FOR CLARITY.
2. SUPPORT MECHANISMS FOR VALVES, ACTUATORS, & PIPING NOT SHOWN FOR CLARITY. REFER TO 1/4 SCALE SECTIONS FOR SUPPORT LOCATIONS.
3. HANDRAIL NOT SHOWN FOR CLARITY. SEE NEW FILTER GALLERY SECTION FOR NEW HANDRAIL AT FLOOR ELEV. 718'-0" AT TOP OF 36" WASH WATER DRAIN CONCRETE ENCASEMENT.

GENERAL NOTE

ALL DRAWINGS ARE A REPRESENTATION OF ACTUAL CONDITIONS BASED ON 1952 CONSTRUCTION PLAN DRAWINGS. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, SIZES, AND LOCATIONS OF ALL RELEVANT ITEMS.

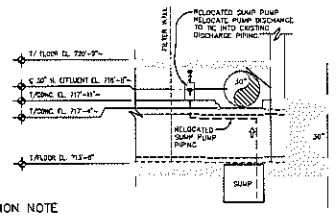
GENERAL NOTE NO. 1 ⚠

THIS NOTE APPLIES TO DRAWINGS FT01 THROUGH FT28

THE WORK ARE FOR ALL CONCRETE SURFACES THAT ARE REPAIRED, INFILLED OR PATCHED SHALL BE SMOOTH AND FLUSH WITH SURROUNDING CONCRETE SURFACES. IF NECESSARY THE CONTRACTOR SHALL GRIND THE NEW SURFACES TO BE FLUSH WITH THE ADJOINING SURFACES.

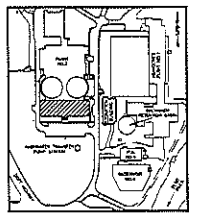
GENERAL CONSTRUCTION NOTE

NO MOUNTING OR FASTENING OF ANY TEMPORARY OR PERMANENT EQUIPMENT, SUPPORTS, OR DEVICES TO THE CONCRETE OF THE FILTER BOXES OR INFLUENT CHANNEL IS PERMITTED.



SECTION 1

SCALE : 1/4" = 1'-0" FT08 | FT08



KEY PLAN

THE DLZ TEAM

FLINT MICHIGAN

CITY OF FLINT
DEPARTMENT OF PUBLIC WORKS & UTILITIES

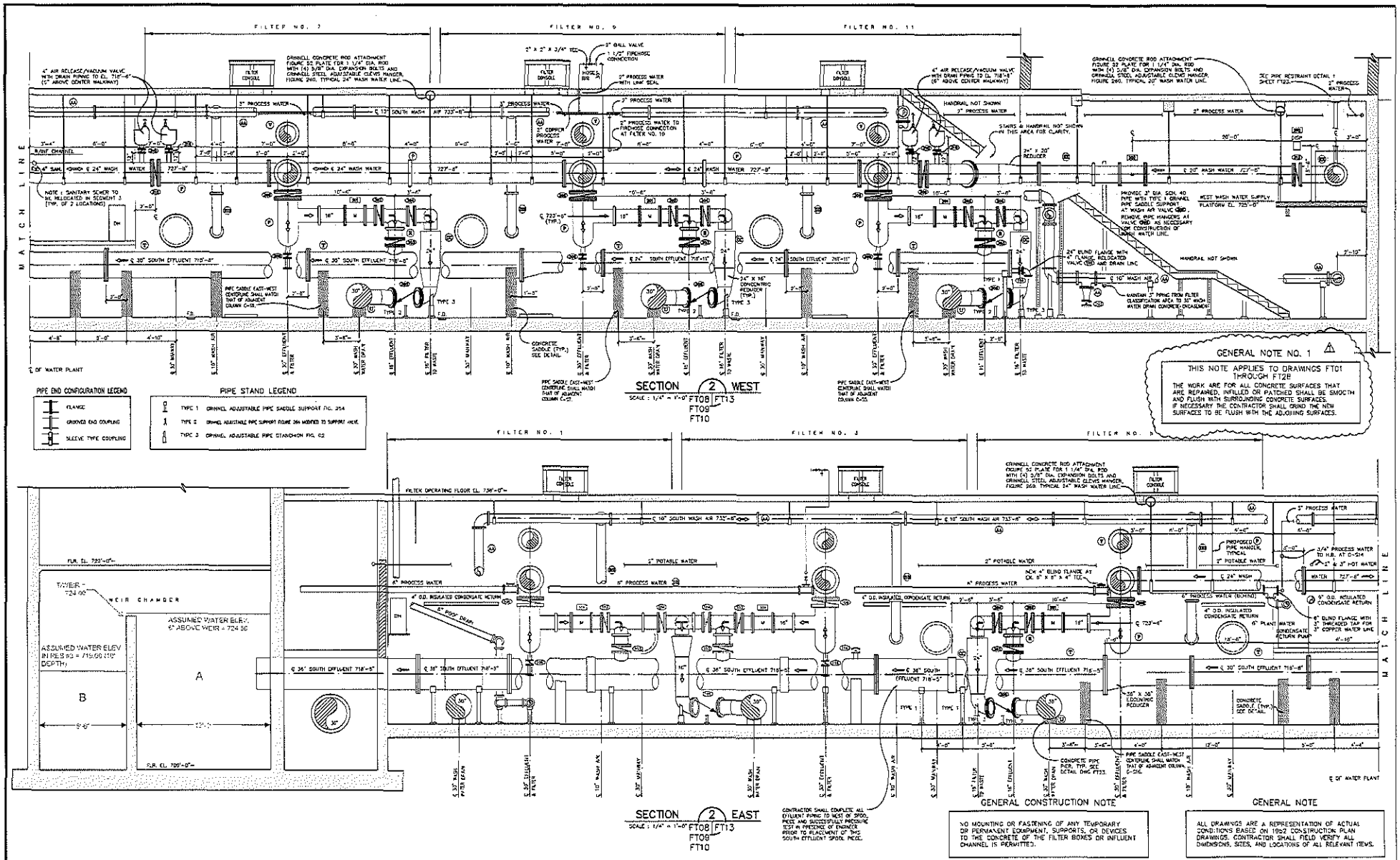
WATER TREATMENT PLANT REHABILITATION
PHASE I, SEGMENT 4

FILTER REHABILITATION
NEW FILTER PLAN — EL. 720'-0"

DRAWN	J.R.P.
CHK'D.	D.A.P.
APPR'D	D.A.P.
DATE	JUNE 2003
PROJECT NUMBER	7019-04

NO.	REVISION	BY	DATE
1	ADDENDUM NO. 1 REVISION	JD	10/03
2	AS-BUILT	DJV	8/05

SHEET
OF
DRAWING NUMBER
FT08



THE DLZ TEAM

FLINT MICHIGAN

CITY OF FLINT
DEPARTMENT OF PUBLIC WORKS & UTILITIES

WATER TREATMENT PLANT REHABILITATION
PHASE 1, SEGMENT 4

FILTER REHABILITATION
NEW FILTER GALLERY SECTIONS

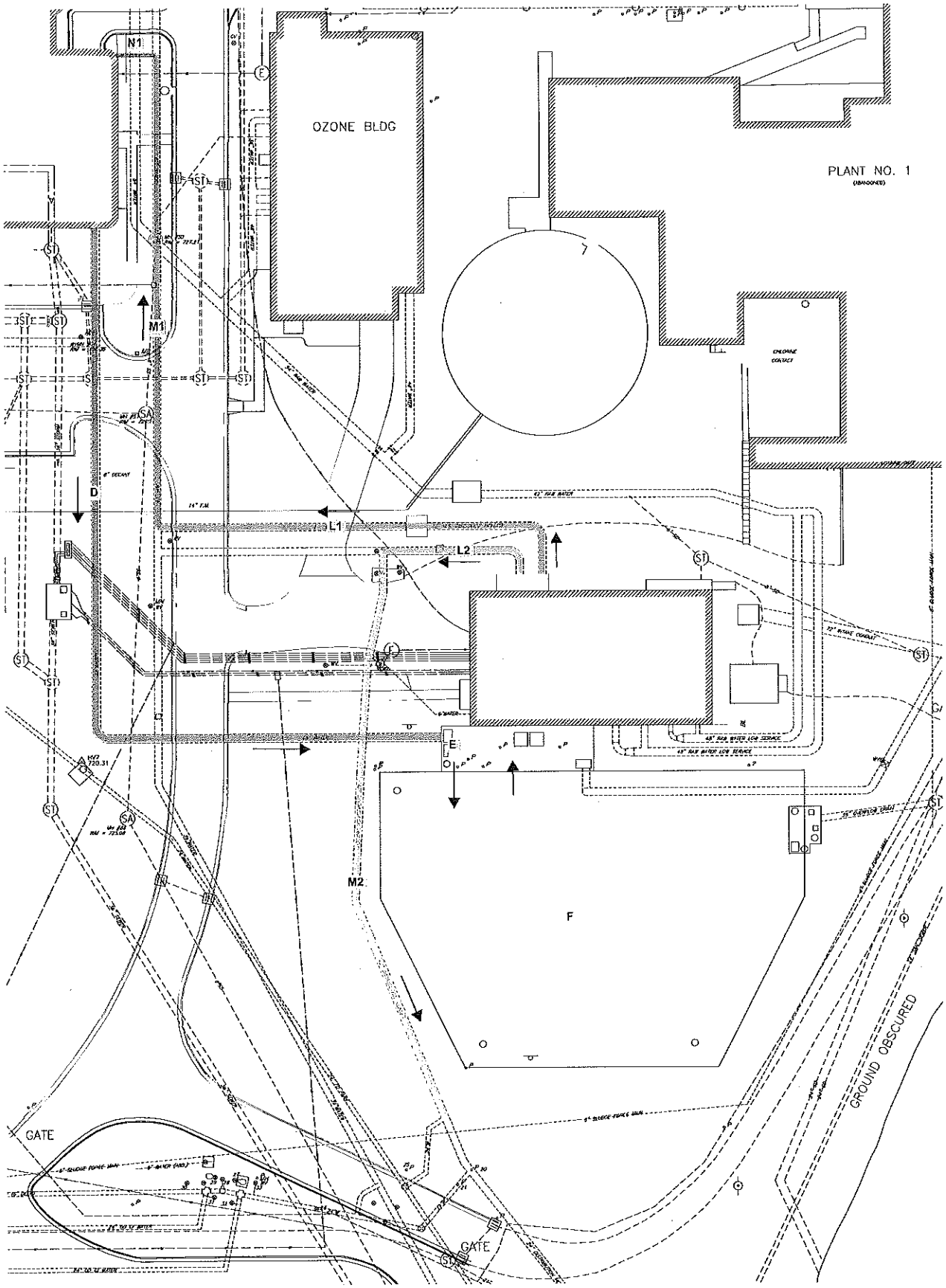
DRAWN	J.B.P.
CHK'D.	D.A.P.
APPR'D	D.A.P.
DATE	JUNE 2002
PROJECT NUMBER	7019-04

NO.	REVISION	BY	DATE
1	ADDENDUM NO. 1 REVISION	JD	10/03
2	AS-BUILT	DJV	8/05

SHEET
OF
DRAWING NUMBER
FT13

002481

002482


OZONE BLDG
PLANT NO. 1
N1
M1
D
L1
L2
M2
E
F
GATE
GATE
GROUND OBSCURED

002483



CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT

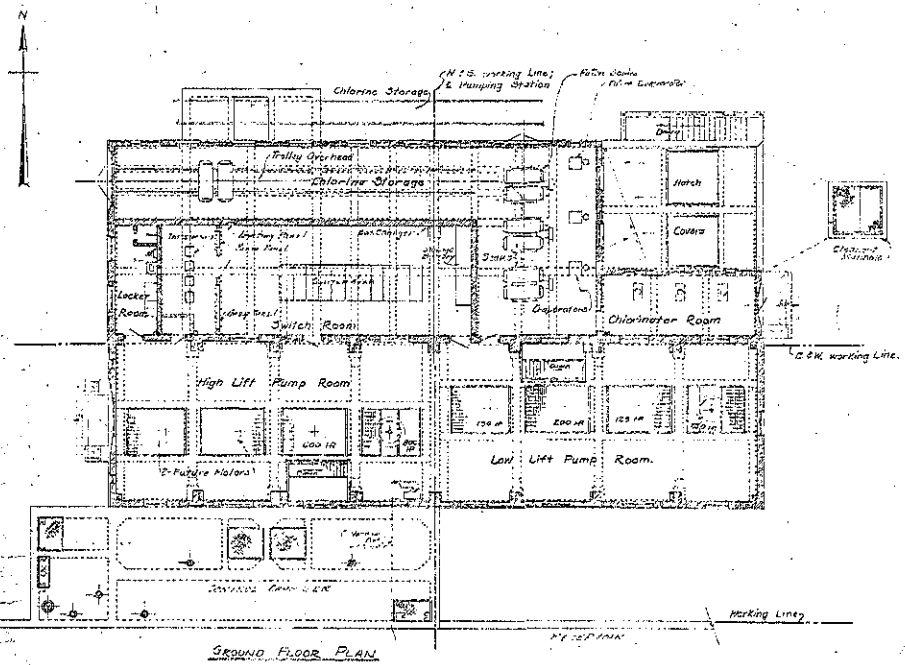
GENERAL PLAN

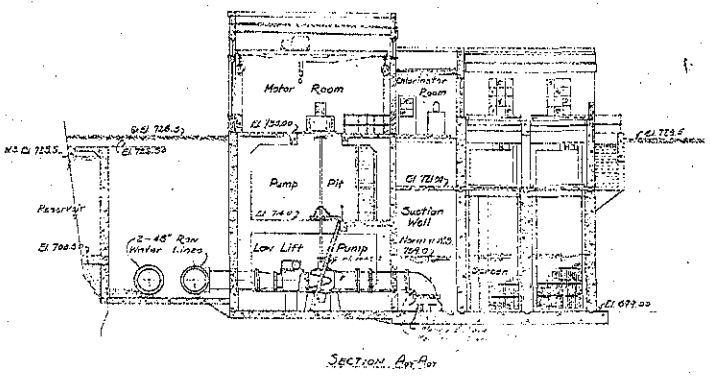
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

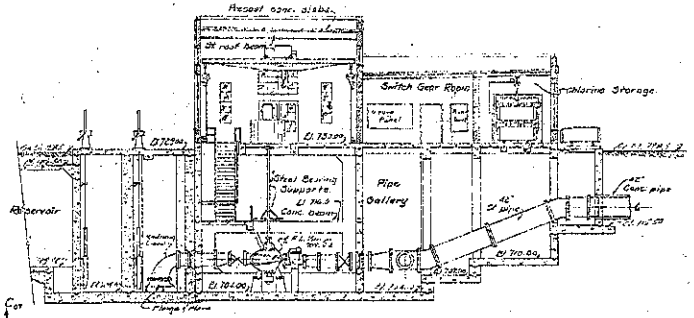
JUNE 1946

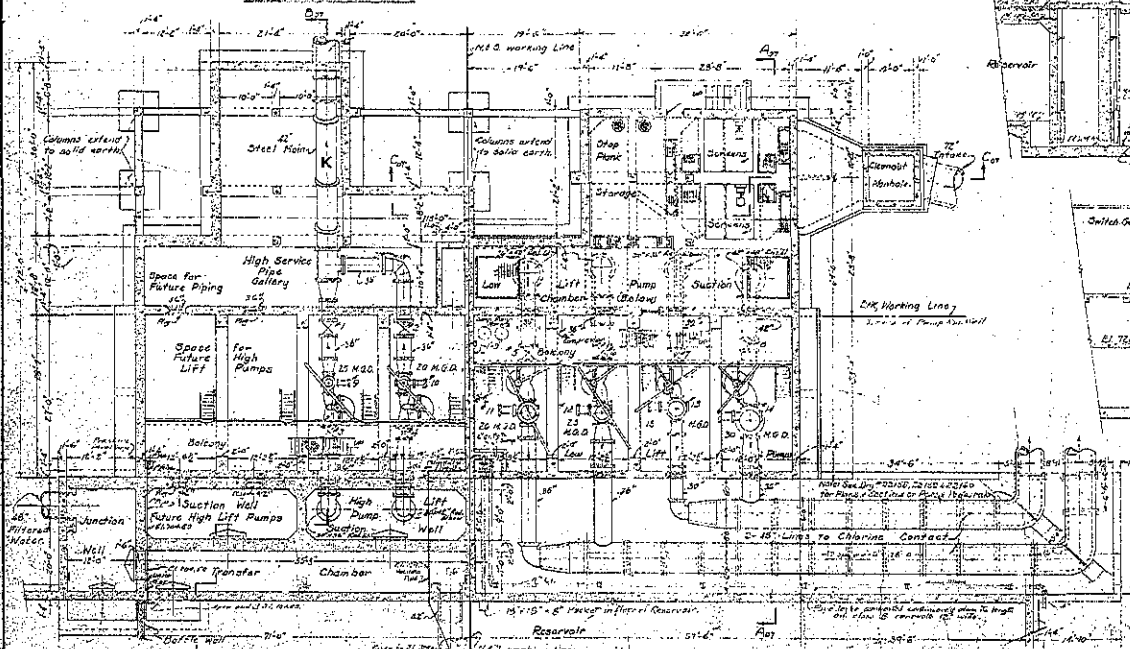
22101-2

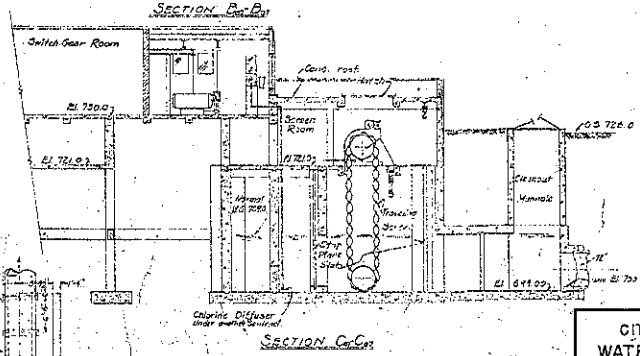
002484











CITY OF FLINT, MICHIGAN.
WATER TREATMENT PLANT.

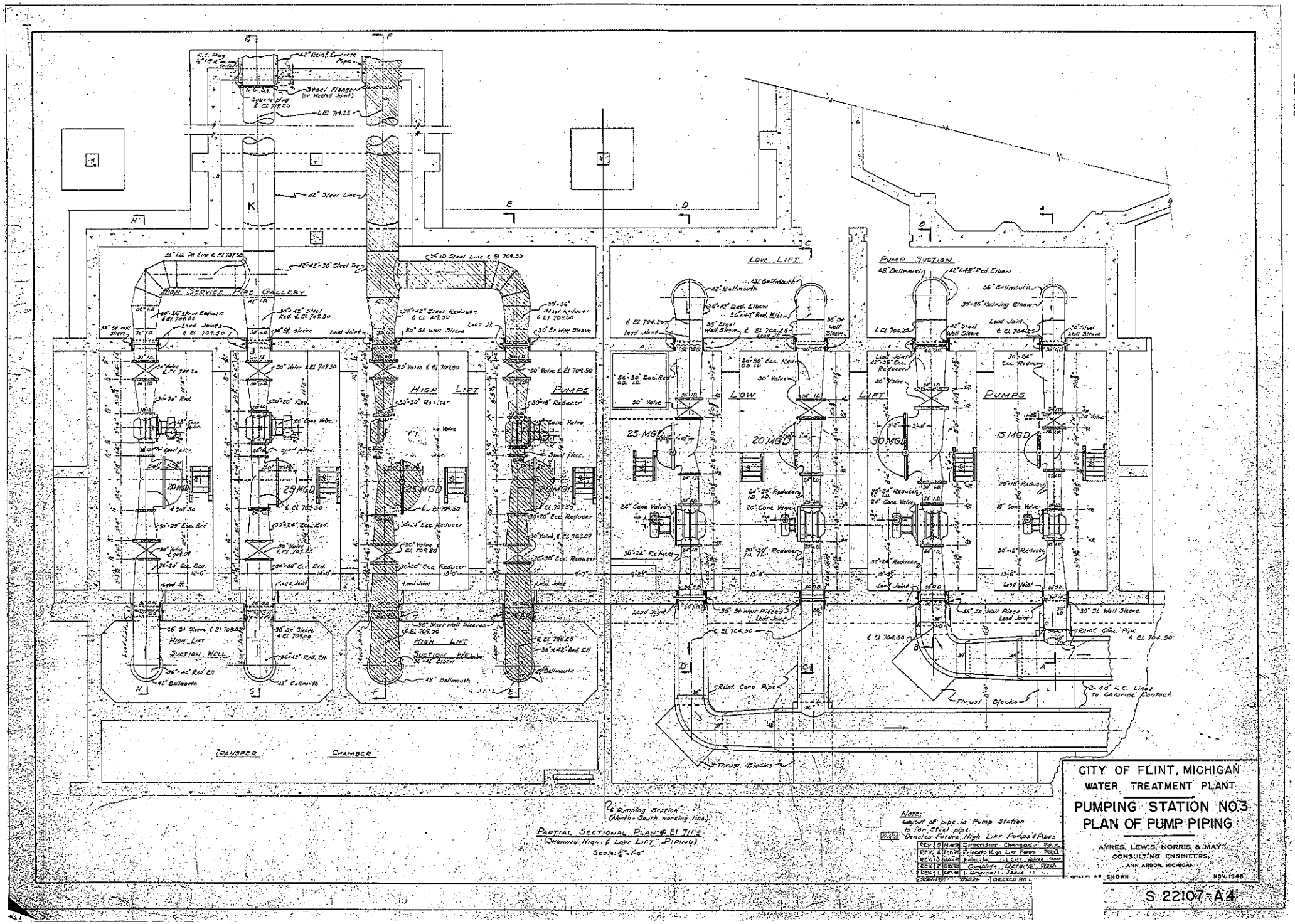
PUMPING STATION NO. 3
GENERAL PLAN.

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: 1"=10'-0" JUNE 1948

22107-2

002485



"℄ Pumping Station"
(North-South working line)

PARTIAL SECTIONAL PLAN @ El. 711.5
(SHOWING HIGH & LOW LIFT PIPING)
Scale: ¼"=1'-0"

Note:
Layout of pipe in Pump Station is for Steel pipe.
XXX Denotes Future High Lift Pumps & Pipes

REV.	BY	MADE	DESCRIPTION CHANGES	SEE EL.
REV. 4	FEB 29		Relocate High Lift Pump 70M.G.	
REV. 3	JUAN 29		Relocate Low Lift Valves	JUAN
REV. 2	DEC 28		Complete Details	1930
REV. 1	OCT 28		Original Issue	
DRAWN BY		TRACED	CHECKED BY	

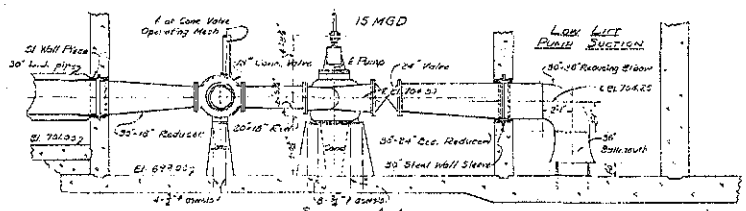
CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
PUMPING STATION NO. 3
PLAN OF PUMP PIPING

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

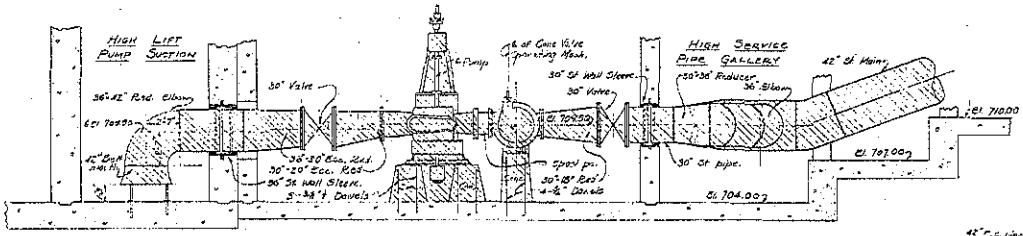
SCALE AS SHOWN — NOV. 1928

S 22107-A4

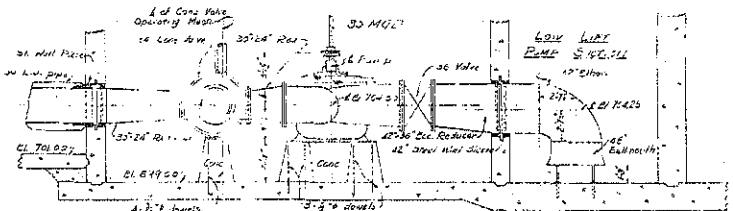
002486



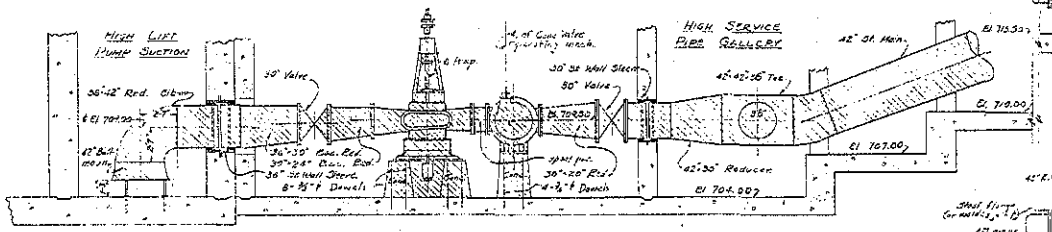
SECTION A-A
(SHOWING 15 MGD PUMP)
Scale: ¼"=1'-0"



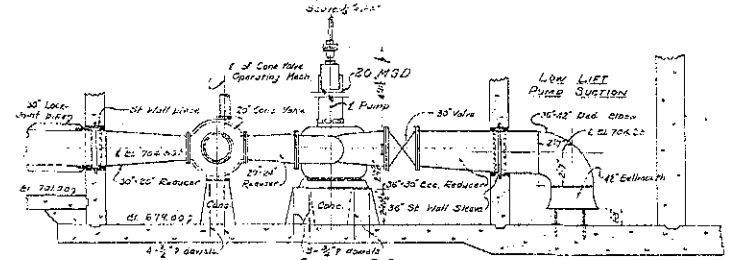
SECTION F-F
(SHOWING 20 MGD PUMP)
Scale: ¼"=1'-0"



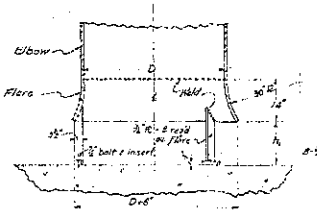
SECTION B-B
(SHOWING 35 MGD PUMP)
Scale: ¼"=1'-0"



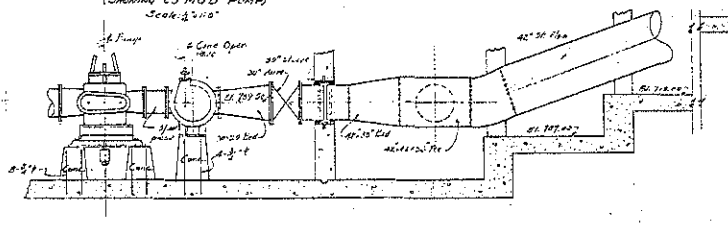
SECTION F-F
(SHOWING 25 MGD PUMP)
Scale: ¼"=1'-0"



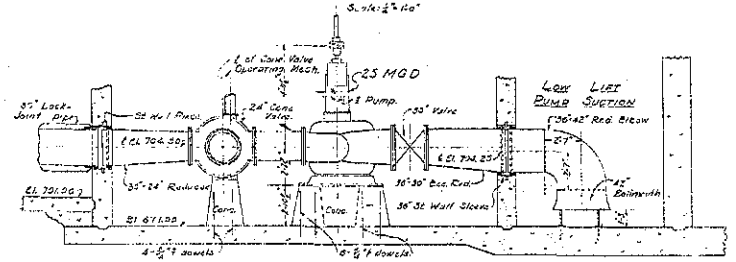
SECTION C-C
(SHOWING 20 MGD PUMP)
Scale: ¼"=1'-0"



BELLMOUTH & SUPPORT DETAILS
No Scale

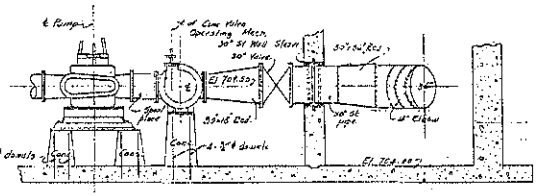


SECTION G-G
(SHOWING 25 MGD PUMP DISCHARGE)
Scale: ¼"=1'-0"



SECTION D-D
(SHOWING 25 MGD PUMP)
Scale: ¼"=1'-0"

High Service	D	D+6"	h
25 M.G.D. Pump	42"	50"	1'-3"
20 M.G.D. Pump	42"	50"	1'-3"
Low Service	**D**	**D+6"**	**h**
25 M.G.D. Pump	36"	42"	1'-0"
20 M.G.D. Pump	42"	50"	1'-3"
35 M.G.D. Pump	48"	56"	1'-6"
30 M.G.D. Pump	48"	56"	1'-6"



SECTION H-H
(SHOWING 20 MGD PUMP DISCHARGE)
Scale: ¾"=1'-0"

Note:
1. XXXX Denotes Future High Lift Pumps & Pipes.
2. Suction piping for HIGH LIFT PUMP 20 as shown in Sects E-E & F-F.

REV	5	Mar. 28	Spool Piece Note, Lettering Sect.
REV	4	Feb. 48	Relocate H. Lift Pumps 77,78,79
REV	3	Jan. 23	Relocate Sluice Valves "H-H"
REV	2	DEC. 47	Complete Details "H-H"
REV	1	OCT. 45	Original Issue
DRAWN BY		"RM" "CP"	CHECKED BY

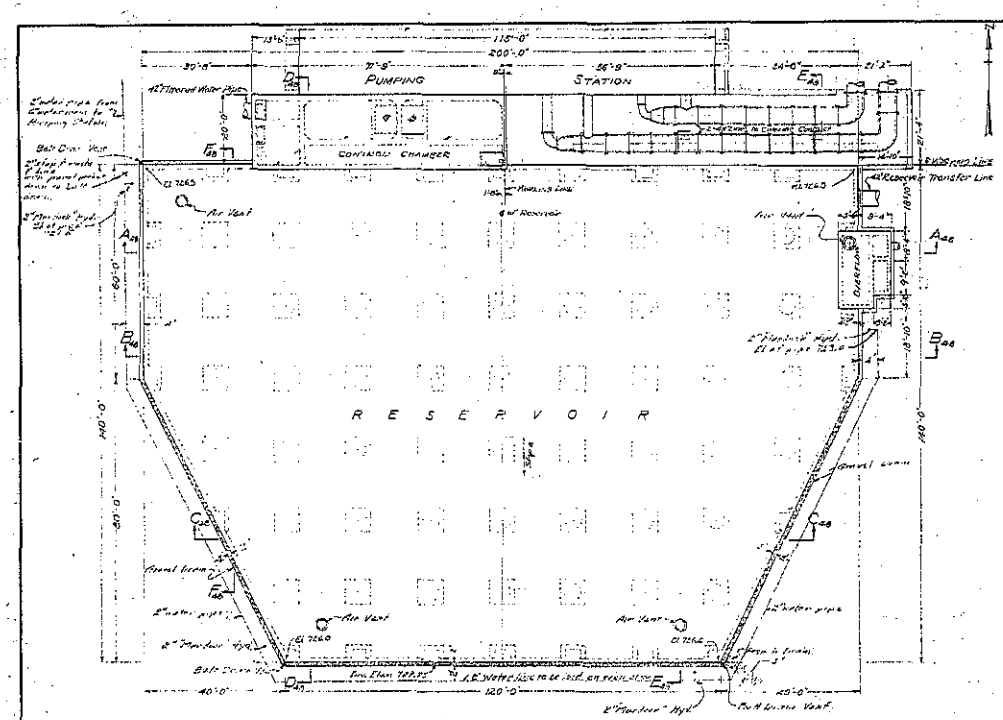
CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
PUMPING STATION NO. 3
SECTIONS OF PUMP PIPING

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: AS SHOWN — NOV. 1945

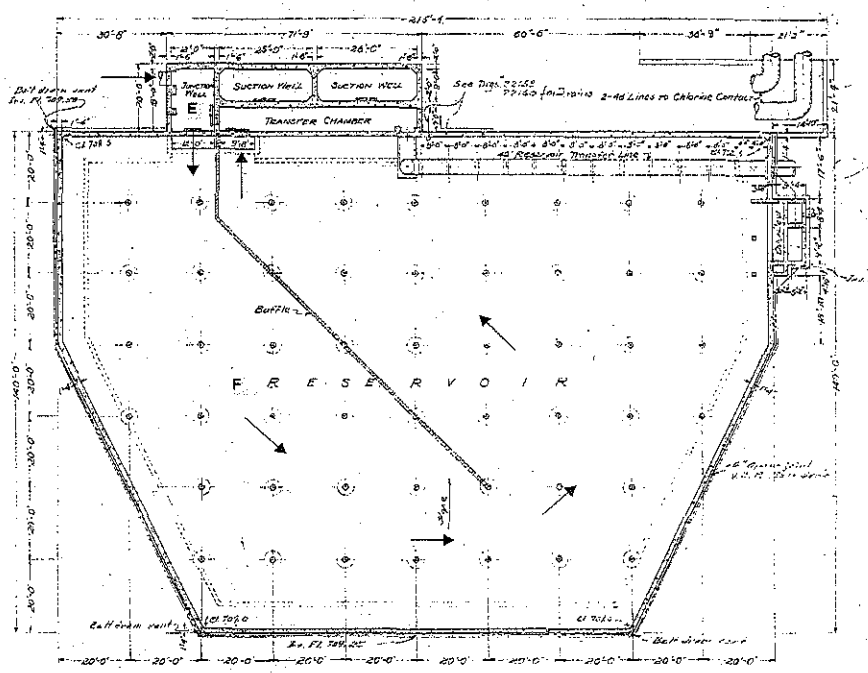
S 22107-B4

002487

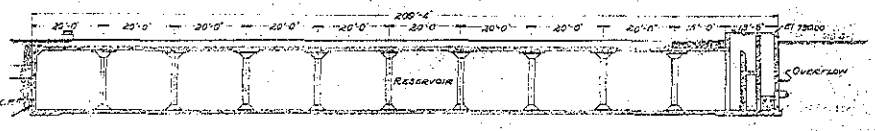


PLAN VIEW OF RESERVOIR

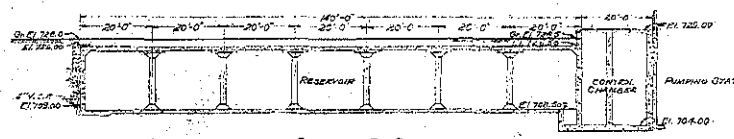
AVG W = $\frac{(200'\times60') + [(200'+120')/2 \times (80')]}{140'}$ = 177'



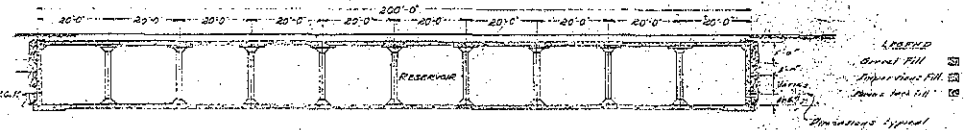
PLAN OF FLOOR-SLAB



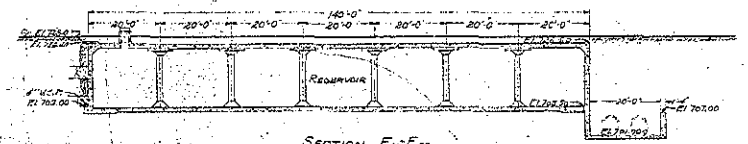
SECTION A_{48}-A_{48}



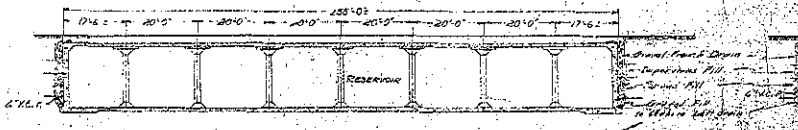
SECTION D_{48}-D_{48}



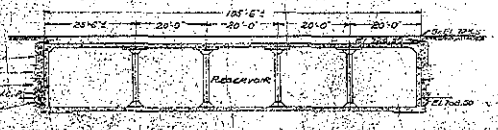
SECTION B_{48}-B_{48}



SECTION E_{48}-E_{48}



SECTION C_{48}-C_{48}



SECTION F_{48}-F_{48}

Typical backfill requirements

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT

RESERVOIR NO. 3
GENERAL PLANS & SECTIONS

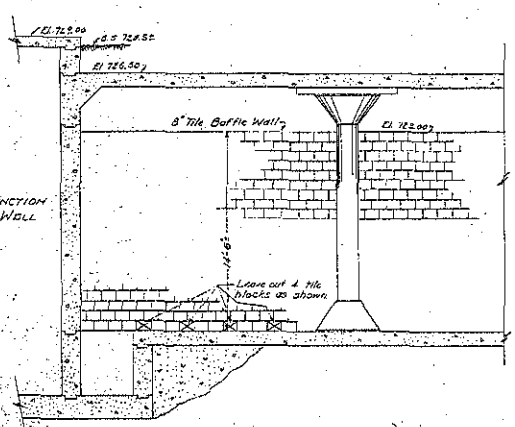
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: 1"=40'

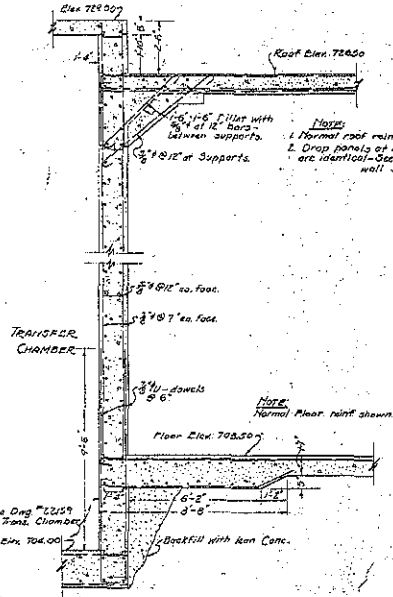
JUNE 1948

22148-2

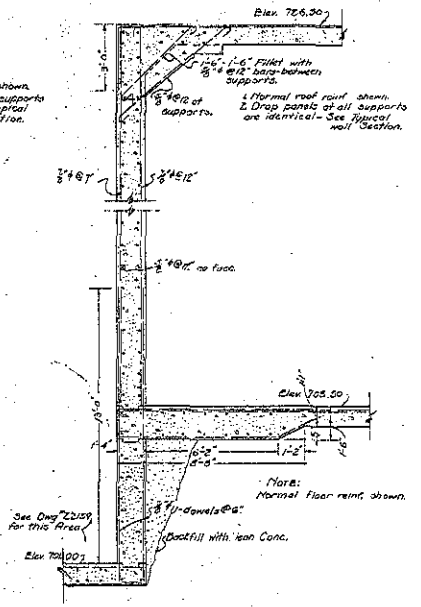
002488



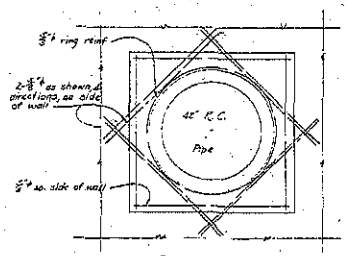
Typical Detail of Tile Baffle Wall
Scale: ½"=1'-0"



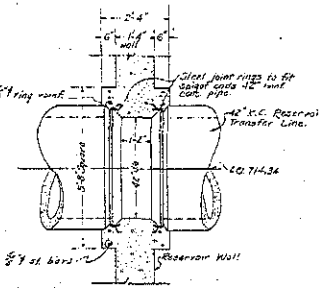
Wall Section at Transfer Chamber
Scale: ⅜"=1'-0"



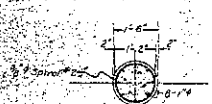
Wall Section East of Transfer Chamber
Scale: ⅜"=1'-0"



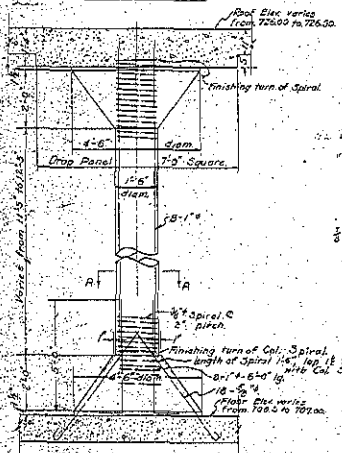
Sectional Plan
42" Transfer Line at Reservoir Wall
Scale: ½"=1'-0"



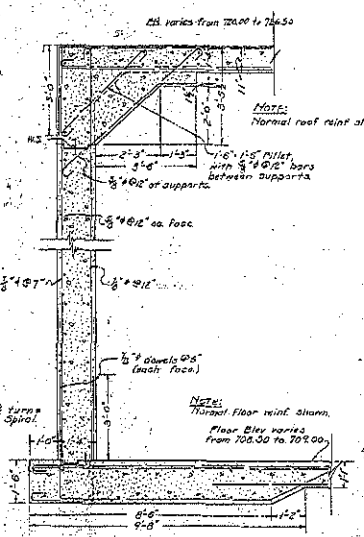
Sectional Elevation
Detail 42" R.C. Transfer Line at Reservoir Wall
Scale: ½"=1'-0"



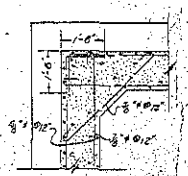
Sectional Plan A-A



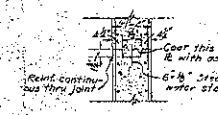
Elevation of Typical Column
Scale: ½"=1'-0"



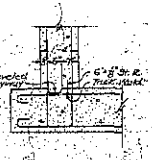
Typical Wall Section
(where wall varies, see other sections)
Scale: ½"=1'-0"



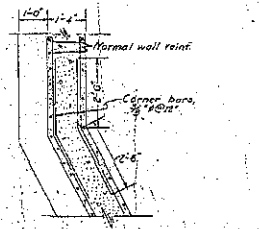
Typical North Corner Details
Scale: ½"=1'-0"



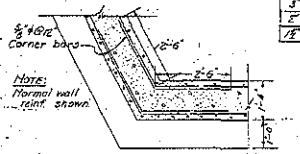
Typical Vertical Joint
Scale: ½"=1'-0"



Horizontal Water Stop
Scale: ½"=1'-0"



Typical for Corners 2 & 5
Scale: ½"=1'-0"

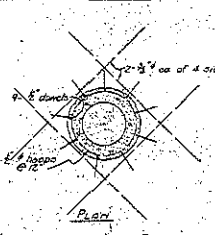


Typical for Corners 1 & 6
Scale: ½"=1'-0"

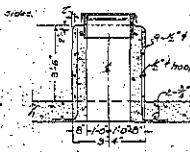
Concrete Cover for Reinforcing Steel	
3"	For bottom face of all footings & base slabs
2"	For all slabs and vertical walls
1½"	For all faces of exposed dry slabs & beams



Roof Fill Detail
No Scale



Plan



Typical Cross Section

Note: For location of Air Vents see Dwg. # E2148

Air Vent Detail
Scale: ¾"=1'-0"
Note: See concrete cover for reinforcing steel this sheet

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
RESERVOIR NO. 3
DETAILS

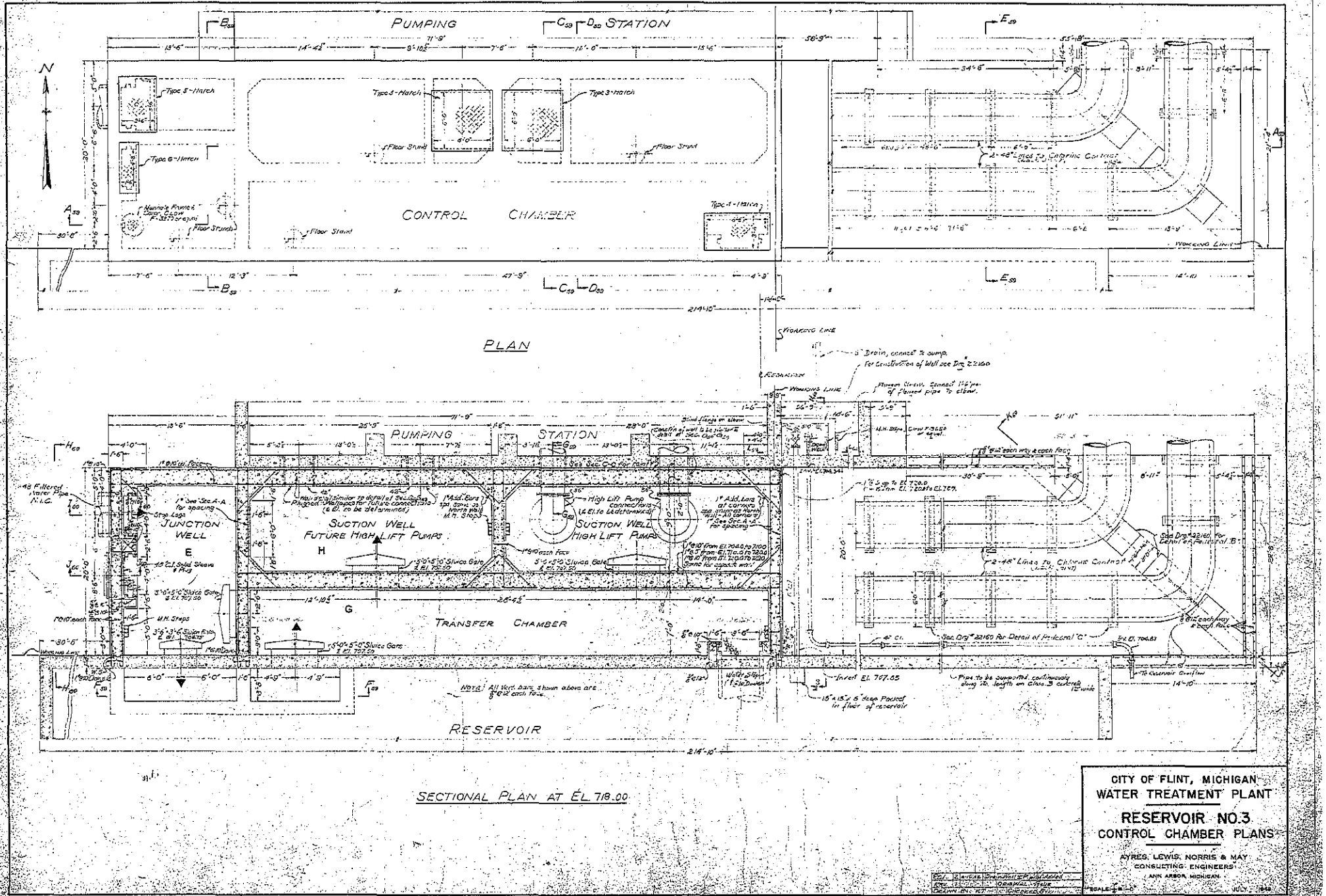
AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

No.	Revision	By	Date
	ORIGINAL ISSUE		

DRAWN BY: M.A.D. CHECKED BY:
SCALE AS NOTED JULY, 1948

22157 - 1

002489



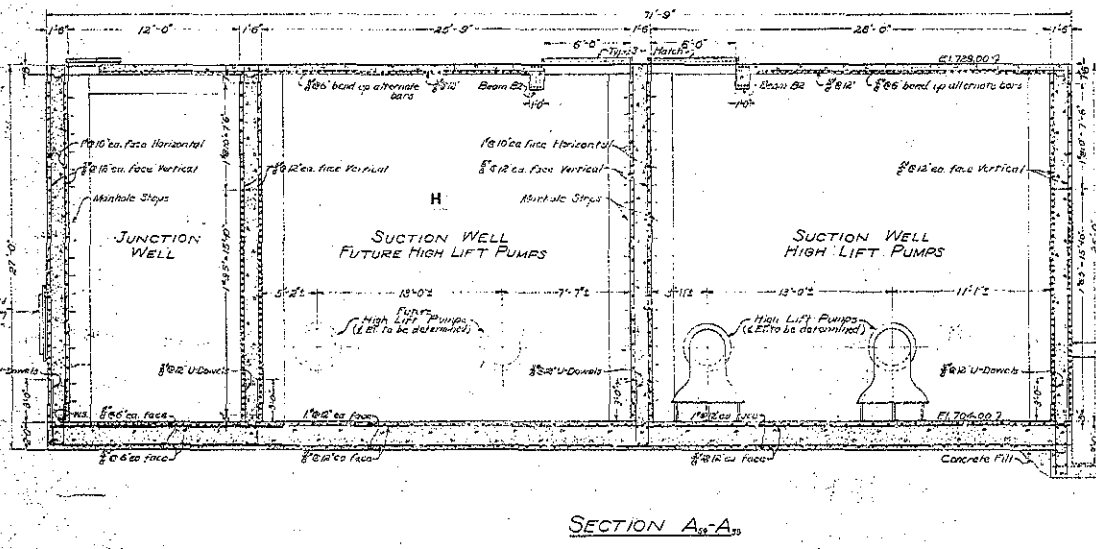
CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
RESERVOIR NO. 3
CONTROL CHAMBER PLANS

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

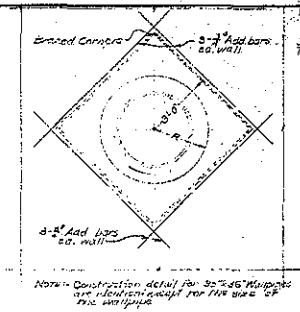
SCALE 1/8" = 1'-0" JULY 1948

221-8-2

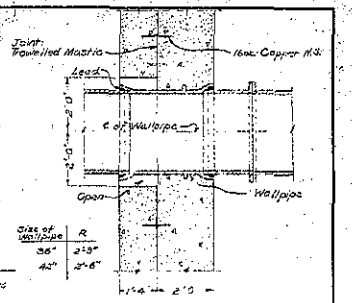
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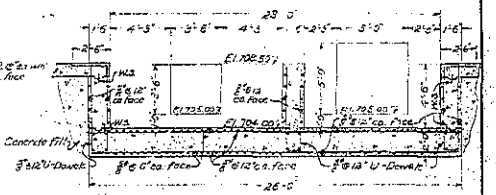
SECTION A_{28}-A_{29}



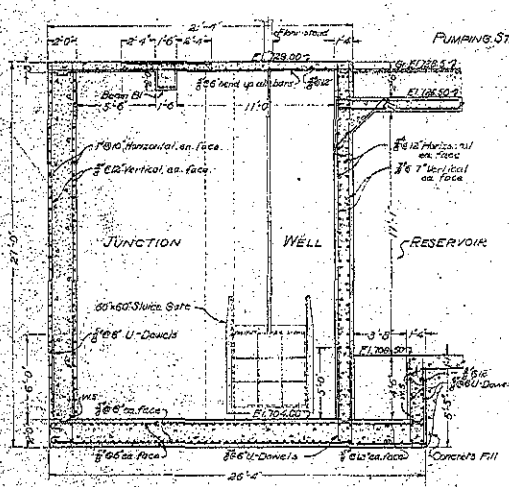
FRONT VIEW
Scale: 1/2"=1'-0"



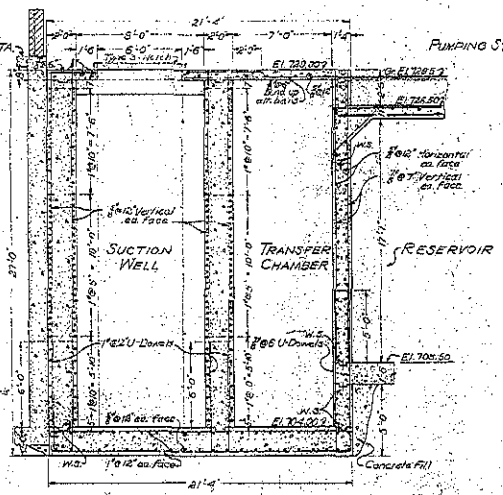
SECTION G_{28}-G_{29}
Scale: 1/2"=1'-0"



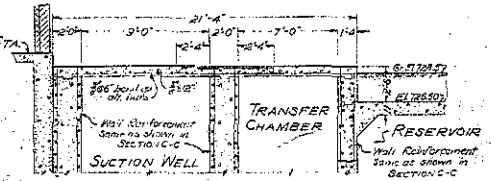
SECTION F_{28}-F_{29}



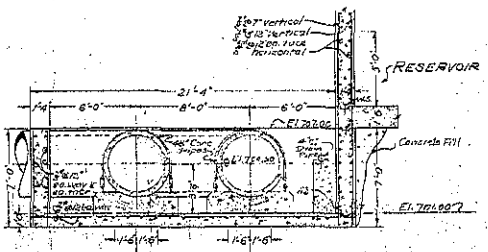
SECTION B_{28}-B_{29}



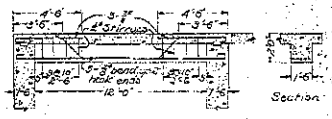
SECTION C_{28}-C_{29}



SECTION D_{28}-D_{29}



SECTION E_{28}-E_{29}



DETAIL OF BEAM B1



DETAIL OF BEAM B2

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT

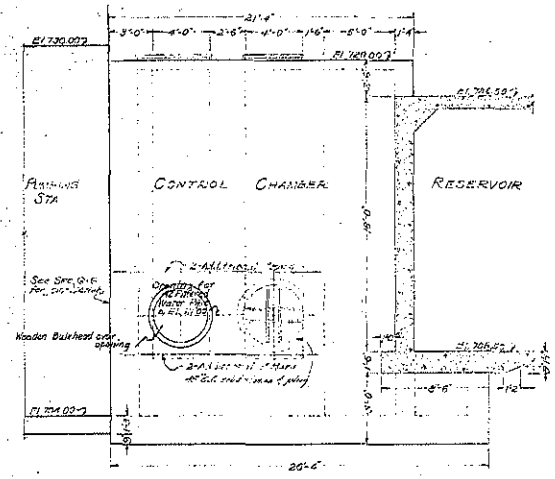
RESERVOIR NO.3
CONTROL CHAMBER SECTIONS

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

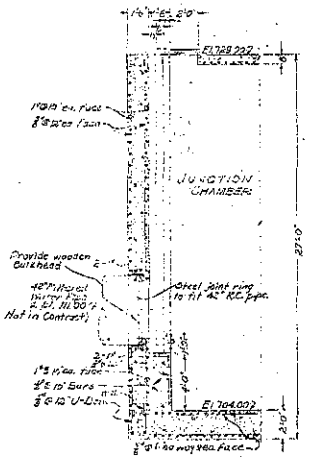
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22159-2

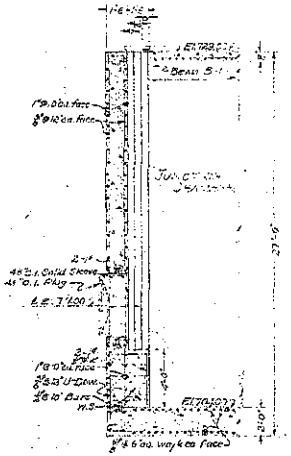
002491



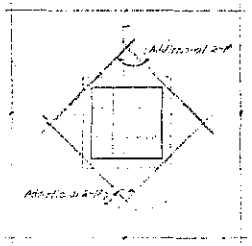
SECTION H_{60}-H_{60}
Scale: $\frac{1}{4}$"=1'-0"



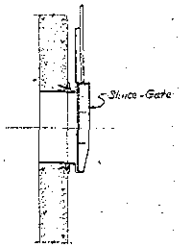
SECTION I_{60}-I_{60}
Scale: $\frac{1}{4}$"=1'-0"



SECTION J_{60}-J_{60}
Scale: $\frac{1}{4}$"=1'-0"

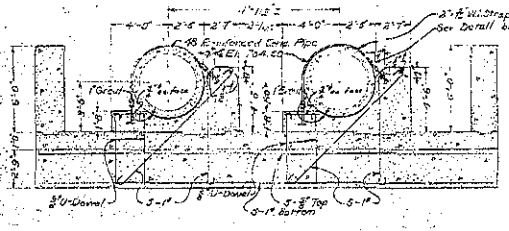


FRONT VIEW

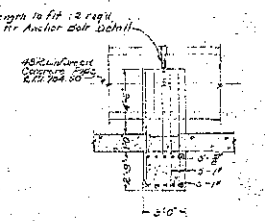


SECTION

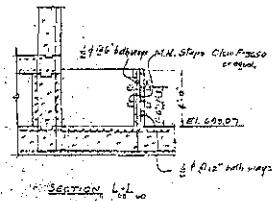
TYPICAL SLUICE GATE INSTALLATION



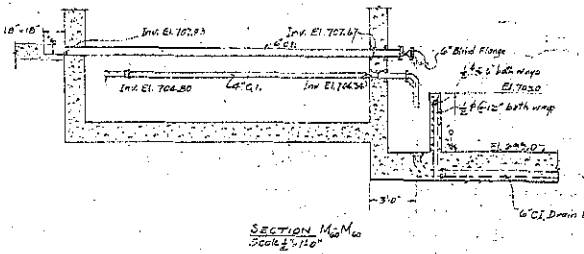
PEDESTAL 'B'
SECTION K_{60}-K_{60}
Scale: $\frac{1}{4}$"=1'-0"



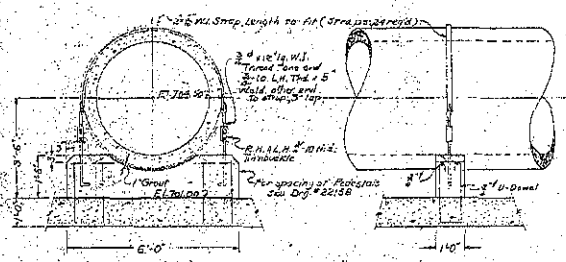
SECTIONAL VIEW
Scale: $\frac{1}{4}$"=1'-0"



SECTION L_{60}-L_{60}
Scale $\frac{1}{4}$"=1'-0"

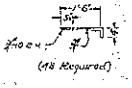


SECTION M_{60}-M_{60}
Scale $\frac{1}{4}$"=1'-0"



FRONT VIEW
SIDE VIEW

(24 Required)
DETAIL OF PEDESTAL 'C'
Scale: $\frac{1}{4}$"=1'-0"



(48 Required)
ANCHOR BOLT DETAIL
Scale: $\frac{1}{4}$"=1'-0"

CITY OF FLINT, MICHIGAN
WATER TREATMENT PLANT
RESERVOIR NO. 3
CONTROL CHAMBER DETAILS

AYRES, LEWIS, NORRIS & MAY
CONSULTING ENGINEERS
ANN ARBOR, MICHIGAN

SCALE: $\frac{1}{4}$"=1'-0" UNLESS NOTED JULY 1948

22160-2

Rennaker, Joanne (DEQ)

From: Poy, Thomas <poy.thomas@epa.gov>
Sent: Monday, September 21, 2015 12:19 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint MI: LCR Enforcement Issues
Attachments: Flint LCR for FOIA 6429-15 (5).pdf; FOIA 15-585 Part 2 55pgs (12).pdf

Liane/Richard/Steve: Marc Edwards sent the email below to a number of EPA addressees. You probably want to forward this to Dan Wyant too.

Tom

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

From: Shoven, Heather
Sent: Monday, September 21, 2015 7:33 AM
To: Bair, Rita; Damato, Nicholas; Poy, Thomas
Cc: Deltoral, Miguel
Subject: FW: Flint MI: LCR Enforcement Issues

Hi Tom, Nick, and Rita --

I will set up a meeting to discuss this email. Let me know if you would like me to include HQ. Thanks!

Best wishes,
Heather

Heather A. Shoven | Enforcement Team Leader | U.S. Environmental Protection Agency, Region 5
Ground Water and Drinking Water Branch | 77 W. Jackson Blvd (WG-15J) | Chicago, IL 60604 | 312-886-0153

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Sunday, September 20, 2015 9:30 PM
To: Schock, Michael; Lytle, Darren; kempic.jeffrey@epa.gove; Burneson, Eric; demarco.carol@epa.gov; Murphy, Thomas; Shoven, Heather; Deltoral, Miguel
Subject: Flint MI: LCR Enforcement Issues

Mike, Darren, Jeff, Eric, Carol and Miguel and R5 MI/Enforcement personnel (as listed on the R5 webpage).

In this e-mail, I am making you aware of what we know regarding the Flint lead situation.

1) They do not have an approved lead sampling pool. Only 13 of the lowest lead sampled homes from 2014, were resampled in 2015.
The homes sampling high in 2014, were not asked to be resampled.
At best, their program is sending out sampling bottles at random across the city.

2) This message exemplifies the type of site selection, that they are doing to satisfy their high risk LCR monitoring pool site.
That is, none. They are not even hiding it.
http://www.flintneighborhoodsunited.org/drinking-water-testing/.

3) Furthermore, in a video now on the ACLU website, at the end of the interview, Mike Glasgow (Flint LCR program) notes what is perfectly obvious from looking at the MDEQ FOIA materials.
"we threw out bottles everywhere just to collect as many as we can, just to hit our number, and we just turn in every result we get in."
Moreover, they do not have the records to show the homes have lead pipe. ***"we are still looking for the records"***
See video here. Start at 4 minutes and 13 seconds to see the admission. ***https://vimeo.com/139882021***

4) On top of that, according to my count, MDEQ covered up no fewer than 5 violations in the 2015 sample round. These include:

a) Technical violation in that what they now stamp as the "draft" report (attached) is late (the signed date is 7/28/2015). It was due 7/10/2015. The final "revised" report is dated 8/20/2015 (also attached), which is 40 days late.

b) Although 87 sites from 2014 were not resampled, no written justification for the site changes was provided in the FOIA materials, and this is required by law.
The statement given today by Flint, that residents were not resampled because they did not want to participate, is contradicted by my conversations with residents.

c) In the original 71 samples Flint submitted late, the lead 90%ile action level was exceeded. MDEQ took the initiative to invalidate 2 samples, dropping Flint below the Action Level.
Flint never requested in writing that any of the samples be invalidated (see the comments written in the box of page 1, FOIA 15-585).
Mike Glasgow says that the 2 high samples were deleted based on the conference call. Only the high samples were scrutinized for meeting the sample pool criteria.
No low samples were investigated. I have the e-mails.

4) The "Draft 7/28/2015" and "revised 8/20/2015" LCR reports, on page 1, check boxes that note Tier 1 sites are not used. MDEQ asks no questions about that. In video Mike admits he has no knowledge of what sites actually have lead pipe or not.

5) Flint did not achieve the minimum number of samples as determined before the sampling round. In his e-mail Mike Glasgow (see below, and see FLINT LCR FOR FOIA...pdf) acknowledges this will be a technical violation. The draft LCR clearly indicates that the minimum was not achieved. MDEQ responds "we are discussing options" to handle this technical violation. In the August 20th revised final report, even this technical violation magically disappears (see comments box on page 1....).

From: Rosenthal, Adam (DEQ)
Sent: Friday, July 10, 2015 11:28 AM
To: 'Michael Glasgow'
Cc: Brent Wright
Subject: RE: lead/copper

we are discussing options regarding this and future rounds of monitoring and will get back with you.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

From: Michael Glasgow [mailto:mglasgow@cityofflint.com]
Sent: Thursday, July 09, 2015 2:19 PM
To: Rosenthal, Adam (DEQ)
Cc: Brent Wright
Subject: Re: lead/copper

Adam,

I just sent the last of the samples to the lab today. Unfortunately we did not reach 100 samples. I believe the count I have is 76 total. Since we have had a few more hits this round, we are going to continue to solicit samples for our own informational purposes. I am disappointed in the turnout of sampling, we distributed close to 200 sample bottles. With this monitoring violation will we be required to collect another round of 100 samples?

KEY POINTS:

1) FLINT HAS LOTS OF LEAD PIPE, NO CORROSION CONTROL TREATMENT, AND HAS HAD NO LEGITIMATE LCR TESTING FOR AT LEAST A YEAR.
2) AMONGST LOW INCOME INFANTS, BREAST FEEDING RATES ARE LOWER, AND FORMULA USE IS HIGHER. MANY FLINTS RESIDENTS CANNOT AFFORD TO FLUSH DUE TO HIGH WATER RATES. THEY CANNOT AFFORD BOTTLED WATER. THIS IS AN UNPRECEDENTED SITUATION AND EPA NEEDS TO TAKE THIS SERIOUSLY. NOW.
3) WE HAVE ONE CHILD WITH ELEVATED BLOOD LEAD ALREADY...IN FACT, THAT IS THE ONLY REASON WE KNOW ABOUT ANY OF THE ABOVE.
4) MDEQ IS STILL PUBLICLY INSISTING FLINT WATER HAS TESTED SAFE, IS SAFE, AND THAT FLINT HAS **NO VIOLATIONS** of any sort.

I believe that someone at HQ or in R5 should immediately take decisive action on this issue to protect the public.

Marc

N DEPARTMENT OF ENVIRONMENTAL QUALITY
F DRINKING WATER AND MUNICIPAL ASSISTANCE

DRAFT

AND COPPER REPORT AND
ONSUMER NOTICE OF LEAD RESULT
CERTIFICATE FOR COMMUNITY WATER SUPPLY

Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: **2310**
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 100 60 7. # of Samples Taken: 71 72 69
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?	
☐	☒	b. Are all samples from Tier 1 sites?	For more information see *Instructions* paragraph 11, subparagraph "Sample Category."
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?	
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?	
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?	

Comments:
A total of 175 sample bottles and instructions were distributed to city residents. We are continuing to solicit samples due to the fact that we did not reach the minimum number for this monitoring period.

Lead service - majority (30,000?)

10. NAME:

Name: Michael Glasgow

Title: Utilites Administrator Phone: 810-766-7135 Date: 7/28/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed) DRAFT

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumbing[2]	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
212 Browning Ave.	2/18/15	1	L	P	104	N.D.	54945
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave. ok	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave. ok	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquettte Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed) DRAFT

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2606 Mountain Ave.	4/15/15	1	L	P	N.D.	N.D.	60546
2020 Crooked Ln.	4/24/15	1	L	C,P	5	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
~~625 S. Grand Traverse~~	~~5/18/15~~	~~5~~	~~L~~	~~C,P~~	~~20~~	~~0.14~~	~~64284~~ X
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robbie Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robbie Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robbie Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robbie Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robbie Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robbie Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7th St.	6/12/15	1	L	C,P	7	0.07	68792

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

19

DRAFT

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/14/15	1	L	P	18	N.D.	68794
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

20

4p

11. TAP SAMPLING DATA: (Use additional sheets as needed)

DRAFT

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169
2114 Flushing Rd.	6/30/15	1	L	C,P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

Consumer Notice of Lead Result in Drinking Water DRAFT

Water Supply Name:	City of Flint		
County:	Genesee	WSSN:	**2310**
Sample Location:	401 E. Newall St.	Date Sampled:	**3/2/15**

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	5
	Copper (ppb)	1300	1300	Not Detected

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: City of Flint Water Plant (810) 787-6537.
For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification: WSSN: 2310
I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. The Notice includes required content.

Michael F. Glasgow — Signature
UTILITIES ADMINISTRATOR — Title
3/17/15 — Date Sent to Consumer

Reminder to water supplier: Complete this certification on only one (1) example copy of a notice sent to a consumer and submit it to the DEQ.

Rosenthal, Adam (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Monday, August 03, 2015 9:57 AM
To: 'Michael Glasgow'
Subject: RE: PbCu Cert form

Morning Mike, I also need copies of all 68 consumer notices. I have 1 from 401 E. Newall St., so 67 more.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

From: Michael Glasgow [mailto:mglasgow@cityofflint.com]
Sent: Friday, July 31, 2015 10:28 AM
To: Rosenthal, Adam (DEQ)
Subject: Re: PbCu Cert form

Adam,

Here is the lead & copper report. I have also sent a hard copy out via USPS.

On Thu, Jul 30, 2015 at 9:33 AM, Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> wrote:

Morning Mike, I'm preparing the 90th percentile letter and I need your lead copper certification form with the cert of notification to the customers. What I have are 68 results that are routine from 1/1 – 6/30/15. The link below is for the form if you don't have one.

http://www.michigan.gov/deq/0,4561,7-135-3313_3675_3691-61640--,00.html

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

For MORs, Lab Results & Reporting Forms:

DEQ-DWMA-Lansing@michigan.gov

--

Mike Glasgow
Utilities Administrator
City of Flint
1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602

Rosenthal, Adam (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Friday, July 10, 2015 11:28 AM
To: 'Michael Glasgow'
Cc: Brent Wright
Subject: RE: lead/copper

we are discussing options regarding this and future rounds of monitoring and will get back with you.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

From: Michael Glasgow [mailto:mglasgow@cityofflint.com]
Sent: Thursday, July 09, 2015 2:19 PM
To: Rosenthal, Adam (DEQ)
Cc: Brent Wright
Subject: Re: lead/copper

Adam,

I just sent the last of the samples to the lab today. Unfortunately we did not reach 100 samples. I believe the count I have is 76 total. Since we have had a few more hits this round, we are going to continue to solicit samples for our own informational purposes. I am disappointed in the turnout of sampling, we distributed close to 200 sample bottles. With this monitoring violation will we be required to collect another round of 100 samples?

Also, I have attached a copy of our June bromate test results.

On Thu, Jul 9, 2015 at 9:55 AM, Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> wrote:

Morning Mike, do you have a count on how many lead/copper samples were turned in? I know they all haven't been run at the lab yet, but if I can verify how many there will be, that would be good. So far I have 70 results and the City is below the AL for lead – current 90th = 13 ppb. All the copper results are below.

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

For MORs, Lab Results & Reporting Forms:

DEQ-DWMA-Lansing@michigan.gov

Mike Glasgow
Utilities Administrator
City of Flint
1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

LEAD AND COPPER REPORT AND CONSUMER NOTICE OF LEAD RESULT CERTIFICATE FOR COMMUNITY WATER SUPPLY

Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: **2310**
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 60 7. # of Samples Taken: 69
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?	
☐	☒	b. Are all samples from Tier 1 sites?	For more information see *Instructions* paragraph 11, subparagraph "Sample Category."
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?	
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?	
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?	

Comments: Revised report after conference call with DEQ staff. Two samples were removed from list for not meeting sample criteria, and due to population the number of samples required was reduced to 60.

10. NAME:

Name: Michael Glasgow

Title: Utilites Administrator Phone: 810-766-7135 Date: 8/20/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave.	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave.	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquettte Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751
2606 Mountain Ave.	4/15/2015	1	L	P	N.D.	N.D.	60546

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2020 Crooked Ln.	4/24/15	1	L	C,P	5	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robbie Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robbie Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robbie Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robbie Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robbie Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robbie Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7th St.	6/12/15	1	L	C,P	7	0.07	68792
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/15/14	1	L	P	18	N.D.	68794

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2114 Flushing Rd.	6/30/15	1	L	P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

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TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

LEAD AND COPPER REPORT AND CONSUMER NOTICE OF LEAD RESULT CERTIFICATE FOR COMMUNITY WATER SUPPLY

Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: **2310**
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 100 7. # of Samples Taken: 71
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?	
☐	☒	b. Are all samples from Tier 1 sites?	For more information see *Instructions* paragraph 11, subparagraph "Sample Category."
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?	
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?	
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?	

Comments:
A total of 175 sample bottles and instructions were distributed to city residents. We are continuing to solicit samples due to the fact that we did not reach the minimum number for this monitoring period.

10. NAME:

Name: Michael Glasgow

Title: Utilites Administrator Phone: 810-766-7135 Date: 7/28/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
212 Browning Ave.	2/18/15	1	L	P	104	N.D.	54945
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave.	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave.	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquettte Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2606 Mountain Ave.	4/15/15	1	L	P	N.D.	N.D.	60546
2020 Crooked Ln.	4/24/15	1	L	C,P	5	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
625 S. Grand Traverse	5/18/15	5	L	C,P	20	0.14	64284
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robbie Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robbie Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robbie Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robbie Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robbie Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robbie Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7th St.	6/12/15	1	L	C,P	7	0.07	68792

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11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/14/15	1	L	P	18	N.D.	68794
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

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Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

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2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169
2114 Flushing Rd.	6/30/15	1	L	C,P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033

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TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

Consumer Notice of Lead Result in Drinking Water

Water Supply Name:	City of Flint		
County:	Genesee	WSSN:	**2310**
Sample Location:	401 E. Newall St.	Date Sampled:	**3/2/15**

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	5
	Copper (ppb)	1300	1300	Not Detected

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: City of Flint Water Plant (810) 787-6537.
For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification: WSSN: 2310
I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. The Notice includes required content.

Michael Flanigan — Signature
UTILITIES ADMINISTRATOR — Title
3/17/15 — Date Sent to Consumer

Reminder to water supplier: Complete this certification on only one (1) example copy of a notice sent to a consumer and submit it to the DEQ.

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
LF58413

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:	778 E BUNDY AVE,FLINT	Source:	TYPE I	
Collected By:	SANDRA HULL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/24/2015	06:25
Sample Point:	MAIN BATHROOM	Date Received:	03/31/2015	11:11
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 #
Copper	Not detected	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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
LF58414

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:	3714 BEECHER RD,FLINT	Source:	TYPE I	
Collected By:	MELISSA MAYS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/24/2015	06:30
Sample Point:	KITCHEN	Date Received:	03/31/2015	11:11
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 #
Copper	0.52	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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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
LF59749

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:	1016 INGLESIDE AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JAMES D JARVIS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/09/2015	07:00
Sample Point:	KITCHEN	Date Received:	04/14/2015	11:07
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 #
Copper	0.07	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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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

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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF59750

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:	1818 ROCK CREEK LN,FLINT	Source:	Single Family Dwelling
Collected By:	HELEN HUNTER	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	04/06/2015 06:50
Sample Point:	MAIN BATHROOM	Date Received:	04/14/2015 11:07
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 #
Copper	0.11	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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Laboratory Contacts
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Systems Mgmt. Unit Mgr: George Krisztian

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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF59751

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:	3010 CHEYENNE ST,FLINT	Source:	Single Family Dwelling	
Collected By:	GERTRUDE MARSHALL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/03/2015	08:50
Sample Point:	KITCHEN	Date Received:	04/14/2015	11:07
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 #
Copper	0.10	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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mg/L : milligrams / Liter (ppm)
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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF61845

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:	2020 CROOKED LN,FLINT	Source:	Single Family Dwelling	
Collected By:	TRACY & M IKE SARGENT	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/24/2015	07:00
Sample Point:	KITCHEN	Date Received:	05/04/2015	10:21
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 #
Copper	0.10	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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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
LF61846

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:	310 E MOORE ST,FLINT	Source:	Single Family Dwelling	
Collected By:	HUSTON BOLDEN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/22/2015	07:00
Sample Point:	KITCHEN	Date Received:	05/04/2015	10:21
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 #
Copper	Not detected	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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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FAX: (517) 335-8562

Sample Number
LF67423

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:	344 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	CASSANDRA BROWN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:15
Sample Point:	BATHROOM	Date Received:	06/11/2015	10:51
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 #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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TEL: (517) 335-8184
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Sample Number
LF67424

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:	357 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	FRANK EVANS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	0.20	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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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
LF67425

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:	328 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	WILLIE TURNER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/30/2015	06:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	0.09	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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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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FAX: (517) 335-8562

Sample Number
LF67426

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:		
Collection Address:	341 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	FLORISSA STEBBINS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	06:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	0.05	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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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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
LF67427

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:	353 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	ZETAN EVANS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/30/2015	06:45
Sample Point:	BATHROOM	Date Received:	06/11/2015	10:51
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 #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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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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
LF67428

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:	349 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	DORIS NUNN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	Not detected	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF63410

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:	631 ALVORD AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JANICE BERRYMAN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/06/2015	07:00
Sample Point:	MAIN BATHROOM	Date Received:	05/13/2015	11:26
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 #
Copper	Not detected	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.042	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF63411

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:	216 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	DEB	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/07/2015	08:00
Sample Point:	KITCHEN	Date Received:	05/13/2015	11:26
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 #
Copper	0.31	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.022	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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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

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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF59748

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:	212 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LEEANNE WALTERS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/02/2015	08:00
Sample Point:	PRE P O S FILTER	Date Received:	04/14/2015	11:07
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.11	04/16/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.707	04/16/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF54663

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:	2206 FLUSHING RD,FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/15/2015 06:00
Sample Point:	KITCHEN	Date Received:	02/17/2015 10:47
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 #
Copper	0.13	02/18/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	02/18/2015	0.001	0.015	EPA 200.8	7439-92-1

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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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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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: Julie Pieper
Systems Mgmt. Unit Mgr: George Krisztian

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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF56223

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:	4202 CUSTER AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JACQUELINE PEMBERTON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/04/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	0.27	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF56224

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:	212 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LEEANNE WALTERS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/03/2015	06:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.397	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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
LF56225

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:	401 E NEWALL ST,FLINT	Source:	Single Family Dwelling	
Collected By:	MARK CROMWELL SR	Site Code:		
Township/Well#/Section:	//	Collector:	Other	
County:	Genesee	Date Collected:	03/02/2015	09:30
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Sample Number
LF56226

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:	215 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	KEVIN & JENNIFER STARNES	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/02/2015	06:30
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	0.16	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF56227

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:	2615 TRUMBULL AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JENNIFER PEDERSON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/27/2015	10:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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
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810 257-3603

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

Sample Number
LF56228

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:	201 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	FLOYD BELL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/05/2015	09:30
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Sample Number
LF54945

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:	212 BROWNING AVE,FLINT	Source:	TYPE I	
Collected By:	LEANNE WALTERS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/18/2015	07:15
Sample Point:	KITCHEN	Date Received:	02/19/2015	11:13
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 #
Copper	Not detected	02/20/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.104	02/20/2015	0.001	0.015	EPA 200.8	7439-92-1

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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 Pleper
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) 335-8662

Sample Number
LF54946

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:	1809 STEVENSON ST,FLINT	Source:	TYPE I	
Collected By:	MIKE TAYLOR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/10/2015	06:30
Sample Point:	KITCHEN SINK	Date Received:	02/19/2015	11:13
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 #
Copper	Not detected	02/20/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.010	02/20/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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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
LF57728

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:	1224 DECKER ST,FLINT	Source:	Single Family Dwelling	
Collected By:	LOU ANNE MALIS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/17/2015	06:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.10	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.013	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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
LF57729

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:	212 BROWNING AVE,FLINT	Source:	Single Family Dwelling
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	03/18/2015 11:10
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
Water System:	Treated Public Distribution System	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF57730

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:	1220 DECKER ST,FLINT	Source:	Single Family Dwelling
Collected By:	CARMEN PULIDO	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/17/2015 06:00
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF57731

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:	1379 WASHINGTON,FLINT	Source:	Single Family Dwelling	
Collected By:	ROXANNE PUTMAN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/19/2015	08:30
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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 Pleper
Systems Mgmt. Unit Mgr: George Krisztian

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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF57732

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:	1383 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	ANTHONY PALLADENO	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/09/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.16	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF57733

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:	1372 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling
Collected By:	ANTHONY PALLADENO JR	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/19/2015 08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015 11:05
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 #
Copper	0.14	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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
810 257-3803

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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

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

Sample Number
LF57734

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:	1383 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	ANTHONY PALLADENO III	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/19/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.17	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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: Julie 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
LF57735

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:	1367 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling
Collected By:	LEAH PALLADENO	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	03/17/2015 06:00
Sample Point:	MAIN BATHROOM	Date Received:	03/24/2015 11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

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

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

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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USEPA Region V Drinking Water Cert. No. MI00003
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Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF57736

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:	1701 MARQUETTE DR,FLINT	Source:	Single Family Dwelling	
Collected By:	CHARMA DOMPREH	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/14/2015	09:40
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.19	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF68791

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:	1615 S FRANKLIN AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	VIVAN GRIER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	09:45
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF68792

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:	853 E 7TH ST,FLINT	Source:	Single Family Dwelling	
Collected By:	LAURA STUDACHER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/12/2015	06:30
Sample Point:	BATHROOM	Date Received:	06/19/2015	11:02
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 #
Copper	0.07	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF68793

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:	1150 WOODSIDE DR,FLINT	Source:	Single Family Dwelling	
Collected By:	DEBORAH CONRAD	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	07:30
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.029	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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

Sample Number
LF68794

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:	547 COPEMAN BLVD,FLINT	Source:	Single Family Dwelling	
Collected By:	LINDA LEE	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	09:00
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.018	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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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
LF68023

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:	1807 OREN AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	MARK RUSSEL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/08/2015	07:30
Sample Point:	BATHROOM	Date Received:	06/16/2015	11:11
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 #
Copper	Not detected	06/17/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.021	06/17/2015	0.001	0.015	EPA 200.8	7439-92-1

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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
LF64282

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:	625 S GRAND TRAVERSE,FLINT	Source:	TYPE III
Collected By:	MIKE GLASGOW	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	05/15/2015 13:00
Sample Point:	BATHROOM	Date Received:	05/20/2015 11:24
Water System:	Treated Public Distribution System	Purpose:	Other

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.017	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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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
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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
LF64283

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:	3714 BEECHER RD,FLINT	Source:	Single Family Dwelling	
Collected By:	MELISSA MAYS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/14/2015	06:00
Sample Point:	MAIN BATHROOM	Date Received:	05/20/2015	11:24
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 #
Copper	0.15	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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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

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

Sample Number
LF64284

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:	625 S GRAND TRAVERSE,FLINT	Source:	TYPE III	
Collected By:	MIKE SARGENT	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/18/2015	08:30
Sample Point:	UTILITY SINK	Date Received:	05/20/2015	11:24
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.020	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
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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
LF64285

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:	912 LEXINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LAURA HATT	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/15/2015	09:00
Sample Point:	MAIN BATHROOM	Date Received:	05/20/2015	11:24
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 #
Copper	Not detected	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

ead/copper

Inbox x

Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> Jul 9
to me

Morning Mike, do you have a count on how many lead/copper samples were turned in? I know they all haven't been run at the lab yet, but if I can verify how many there will be, that would be good. So far I have 70 results and the City is below the AL for lead – current 90th = 13 ppb. All the copper results are below.

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

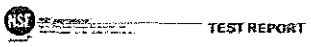
For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

Michael Glasgow <mglasgow@cityofflint.com> Jul 9
to Brent, Adam

Adam,

I just sent the last of the samples to the lab today. Unfortunately we did not reach 100 samples. I believe the count I have is 76 total. Since we have had a few more hits this round, we are going to continue to solicit samples for our own informational purposes. I am disappointed in the turnout of sampling, we distributed close to 200 sample bottles. With this monitoring violation will we be required to collect another round of 100 samples?

Also, I have attached a copy of our June bromate test results.



June 2015 Brom...

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Monday, September 21, 2015 11:56 AM
To: Busch, Stephen (DEQ); Benzie, Richard (DEQ); Sygo, Jim (DEQ); Wurfel, Brad (DEQ); Pallone, Maggie (DEQ); Wyant, Dan (DEQ)
Cc: Thelen, Mary Beth (DEQ); Feuerstein, Heather (DEQ); Shaler, Karen (DEQ); Devereaux, Tracy Jo (DEQ)
Subject: FW: Flint MI: LCR Enforcement Issues
Attachments: image003.png; ATT00001.htm; Flint LCR for FOIA 6429-15 (5).pdf; ATT00002.htm; FOIA 15-585 Part 2 55pgs (12).pdf; ATT00003.htm

EPA just shared the attached

From: Fortin, Denise [mailto:Fortin.Denise@epa.gov]
Sent: Monday, September 21, 2015 11:44 AM
To: Shekter Smith, Liane (DEQ)
Subject: Fwd: Flint MI: LCR Enforcement Issues

Sent from my iPhone

Begin forwarded message:

From: "Henry, Timothy" <henry.timothy@epa.gov>
To: "Fortin, Denise" <Fortin.Denise@epa.gov>
Subject: FW: Flint MI: LCR Enforcement Issues

Tim Henry
Deputy Director, Water Division
U.S. EPA (W-15J)
77 W. Jackson Blvd., Chicago, IL 60604-3590
Phone: 312.886.6107 Fax: 312.692.2578

From: Damato, Nicholas
Sent: Monday, September 21, 2015 7:56 AM
To: Henry, Timothy; Hyde, Tinka
Subject: FW: Flint MI: LCR Enforcement Issues
Importance: High

Tim & Tinka,

Miguel forwarded the email below from Marc Edwards. Miguel then called because he wanted Tinka to have a heads up especially on the info in the ACLU video and didn't want her blindsided

with the content – it should be reviewed carefully. Tom, Rita, Heather, Jennifer, Miguel & I will be having a call with ORC & OECA this morning on Marc's email.

Nick

From: Deltoral, Miguel
Sent: Monday, September 21, 2015 6:52 AM
To: Damato, Nicholas
Subject: Fw: Flint MI: LCR Enforcement Issues
Importance: High

Just noticed you weren't copied on this...

Miguel A. Del Toral
Regulations Manager
U.S. EPA R5 GWDWB
77 West Jackson Blvd, (WG-15J)
Chicago, IL 60604
Phone: (312) 886-5253

From: Marc Edwards <edwardsm@vt.edu>
Sent: Sunday, September 20, 2015 09:29 PM
To: Schock, Michael; Lytle, Darren; kempic.jeffrey@epa.gove; Burneson, Eric; demarco.carol@epa.gov; Murphy, Thomas; Shoven, Heather; Deltoral, Miguel
Subject: Flint MI: LCR Enforcement Issues

Mike, Darren, Jeff, Eric, Carol and Miguel and R5 MI/Enforcement personnel (as listed on the R5 webpage).

In this e-mail, I am making you aware of what we know regarding the Flint lead situation.

1) They do not have an approved lead sampling pool. Only 13 of the lowest lead sampled homes from 2014, were resampled in 2015.
The homes sampling high in 2014, were not asked to be resampled.
At best, their program is sending out sampling bottles at random across the city.

2) This message exemplifies the type of site selection, that they are doing to satisfy their high risk LCR monitoring pool site.
That is, none. They are not even hiding it.
http://www.flintneighborhoodsunited.org/drinking-water-testing/.

3) Furthermore, in a video now on the ACLU website, at the end of the interview, Mike Glasgow (Flint LCR program) notes what is perfectly obvious from looking at the MDEQ FOIA materials.
"we threw out bottles everywhere just to collect as many as we can, just to hit our number, and we just turn in every result we get in."
Moreover, they do not have the records to show the homes have lead pipe. ***"we are still looking for the records"***
See video here. Start at 4 minutes and 13 seconds to see the admission. ***https://vimeo.com/139882021***

4) On top of that, according to my count, MDEQ covered up no fewer than 5 violations in the 2015 sample round. These include:

a) Technical violation in that what they now stamp as the "draft" report (attached) is late (the signed date is 7/28/2015).
It was due 7/10/2015. The final "revised" report is dated 8/20/2015 (also attached), which is 40 days late.

b) Although 87 sites from 2014 were not resampled, no written justification for the site changes was provided in the FOIA materials, and this is required by law.
The statement given today by Flint, that residents were not resampled because they did not want to participate, is contradicted by my conversations with residents.

c) In the original 71 samples Flint submitted late, the lead 90%ile action level was exceeded. MDEQ took the initiative to invalidate 2 samples, dropping Flint below the Action Level.
Flint never requested in writing that any of the samples be invalidated (see the comments written in the box of page 1, FOIA 15-585).
Mike Glasgow says that the 2 high samples were deleted based on the conference call. Only the high samples were scrutinized for meeting the sample pool criteria.
No low samples were investigated. I have the e-mails.

4) The "Draft 7/28/2015" and "revised 8/20/2015" LCR reports, on page 1, check boxes that note Tier 1 sites are not used. MDEQ asks no questions about that. In video Mike admits he has no knowledge of what sites actually have lead pipe or not.

5) Flint did not achieve the minimum number of samples as determined before the sampling round. In his e-mail Mike Glasgow (see below, and see FLINT LCR FOR FOIA...pdf) acknowledges this will be a technical violation. The draft LCR clearly indicates that the minimum was not achieved. MDEQ responds "we are discussing options" to handle this technical violation. In the August 20th revised final report, even this technical violation magically disappears (see comments box on page 1....).

To: 'Michael Glasgow'
Cc: Brent Wright
Subject: RE: lead/copper

we are discussing options regarding this and future rounds of monitoring and will get back with you.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

From: Michael Glasgow [mailto:mglasgow@cityofflint.com]
Sent: Thursday, July 09, 2015 2:19 PM
To: Rosenthal, Adam (DEQ)
Cc: Brent Wright
Subject: Re: lead/copper

Adam,

I just sent the last of the samples to the lab today. Unfortunately we did not reach 100 samples. I believe the count I have is 76 total. Since we have had a few more hits this round, we are going to continue to solicit samples for our own informational purposes. I am disappointed in the turnout of sampling, we distributed close to 200 sample bottles. With this monitoring violation will we be required to collect another round of 100

N DEPARTMENT OF ENVIRONMENTAL QUALITY
F DRINKING WATER AND MUNICIPAL ASSISTANCE

DRAFT

AND COPPER REPORT AND
ONSUMER NOTICE OF LEAD RESULT
CERTIFICATE FOR COMMUNITY WATER SUPPLY

Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: **2310**
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 100 60 7. # of Samples Taken: 71 ~~72~~ 69
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?	
☐	☒	b. Are all samples from Tier 1 sites?	For more information see *Instructions* paragraph 11, subparagraph "Sample Category."
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?	
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?	
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?	

Comments:
A total of 175 sample bottles and instructions were distributed to city residents. We are continuing to solicit samples due to the fact that we did not reach the minimum number for this monitoring period.

Lead service - majority (30,000?)

10. NAME:

Name: Michael Glasgow

Title: Utilites Administrator Phone: 810-766-7135 Date: 7/28/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed) DRAFT

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
212 Browning Ave.	2/18/15	1	L	P	104	N.D.	54945
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave. ok	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave. ok	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquettte Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed) DRAFT

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2606 Mountain Ave.	4/15/15	1	L	P	N.D.	N.D.	60546
2020 Crooked Ln.	4/24/15	1	L	C,P	6	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
~~625 S. Grand Traverse~~	~~5/18/15~~	~~5~~	~~L~~	~~C,P~~	~~20~~	~~0.14~~	~~64284~~ X
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robbie Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robbie Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robbie Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robbie Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robbie Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robbie Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7th St.	6/12/15	1	L	C,P	7	0.07	68792

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[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

19

DRAFT

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/14/15	1	L	P	18	N.D.	68794
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

2-0

11. TAP SAMPLING DATA: (Use additional sheets as needed)

DRAFT

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169
2114 Flushing Rd.	6/30/15	1	L	C,P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

Consumer Notice of Lead Result in Drinking Water DRAFT

Water Supply Name:	City of Flint		
County:	Genesee	WSSN:	**2310**
Sample Location:	401 E. Newall St.	Date Sampled:	**3/2/15**

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	5
	Copper (ppb)	1300	1300	Not Detected

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: City of Flint Water Plant (810) 787-6537.
For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification: WSSN: 2310

I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. The Notice includes required content.

Signature	Title	Date Sent to Consumer
Michael Glasgow	UTILITIES ADMINISTRATOR	3/17/15

Reminder to water supplier: Complete this certification on only one (1) example copy of a notice sent to a consumer and submit it to the DEQ.

Rosenthal, Adam (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Monday, August 03, 2015 9:57 AM
To: 'Michael Glasgow'
Subject: RE: PbCu Cert form

Morning Mike, I also need copies of all 68 consumer notices. I have 1 from 401 E. Newall St., so 67 more.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

From: Michael Glasgow [mailto:mglasgow@cityofflint.com]
Sent: Friday, July 31, 2015 10:28 AM
To: Rosenthal, Adam (DEQ)
Subject: Re: PbCu Cert form

Adam,

Here is the lead & copper report. I have also sent a hard copy out via USPS.

On Thu, Jul 30, 2015 at 9:33 AM, Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> wrote:

Morning Mike, I'm preparing the 90th percentile letter and I need your lead copper certification form with the cert of notification to the customers. What I have are 68 results that are routine from 1/1 – 6/30/15. The link below is for the form if you don't have one.

http://www.michigan.gov/deq/0,4561,7-135-3313_3675_3691-61640--,00.html

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

For MORs, Lab Results & Reporting Forms:

DEQ-DWMA-Lansing@michigan.gov

--

Mike Glasgow
Utilities Administrator
City of Flint
1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602

Rosenthal, Adam (DEQ)

From: Rosenthal, Adam (DEQ)
Sent: Friday, July 10, 2015 11:28 AM
To: 'Michael Glasgow'
Cc: Brent Wright
Subject: RE: lead/copper

we are discussing options regarding this and future rounds of monitoring and will get back with you.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

From: Michael Glasgow [mailto:mglasgow@cityofflint.com]
Sent: Thursday, July 09, 2015 2:19 PM
To: Rosenthal, Adam (DEQ)
Cc: Brent Wright
Subject: Re: lead/copper

Adam,

I just sent the last of the samples to the lab today. Unfortunately we did not reach 100 samples. I believe the count I have is 76 total. Since we have had a few more hits this round, we are going to continue to solicit samples for our own informational purposes. I am disappointed in the turnout of sampling, we distributed close to 200 sample bottles. With this monitoring violation will we be required to collect another round of 100 samples?

Also, I have attached a copy of our June bromate test results.

On Thu, Jul 9, 2015 at 9:55 AM, Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> wrote:

Morning Mike, do you have a count on how many lead/copper samples were turned in? I know they all haven't been run at the lab yet, but if I can verify how many there will be, that would be good. So far I have 70 results and the City is below the AL for lead – current 90th = 13 ppb. All the copper results are below.

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

For MORs, Lab Results & Reporting Forms:

DEQ-DWMA-Lansing@michigan.gov

Mike Glasgow
Utilities Administrator
City of Flint
1101 S. Saginaw St.
Flint, MI 48502
(810)766-7135 ext. 2602

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

LEAD AND COPPER REPORT AND CONSUMER NOTICE OF LEAD RESULT CERTIFICATE FOR COMMUNITY WATER SUPPLY

Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: **2310**
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 60 7. # of Samples Taken: 69
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?	
☐	☒	b. Are all samples from Tier 1 sites?	For more information see *Instructions* paragraph 11, subparagraph "Sample Category."
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?	
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?	
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?	

Comments: Revised report after conference call with DEQ staff. Two samples were removed from list for not meeting sample criteria, and due to population the number of samples required was reduced to 60.

10. NAME:

Name: Michael Glasgow

Title: Utilites Administrator Phone: 810-766-7135 Date: 8/20/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumbing[2]	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave.	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave.	3/5/15	1	L	P	N.D.	N.D.	56228
1224 Decker St.	3/17/15	1	L	C,P	13	0.10	57728
1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
1379 Washington Ave.	3/19/15	1	L	P	8	N.D.	57731
1383 Washington Ave.	3/19/15	1	L	C,P	6	0.17	57734
1372 Washington Ave.	3/19/15	1	L	C,P	2	0.14	57733
1367 Washington Ave.	3/17/15	1	L	P	1	N.D.	57735
1701 Marquettte Dr.	3/14/15	1	L	C,P	1	0.19	57736
778 Bundy Ave.	3/24/15	1	L	P	N.D.	N.D.	58413
3714 Beecher Rd.	3/24/15	1	L	C	2	0.52	58414
1016 Ingleside Ave.	4/9/15	1	L	C,P	7	0.07	59749
1818 Rock Creek Ln.	4/6/15	1	L	C,P	3	0.11	59750
3010 Cheyenne St.	4/3/15	1	L	C,P	5	0.10	59751
2606 Mountain Ave.	4/15/2015	1	L	P	N.D.	N.D.	60546

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
Pb				
Cu				

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2020 Crooked Ln.	4/24/15	1	L	C,P	5	0.10	61845
310 E. Moore St.	4/22/15	1	L	P	5	N.D.	61846
631 Alvord Ave.	5/6/15	1	L	P	42	N.D.	63410
216 Browning Ave.	5/7/15	1	L	C,P	22	0.31	63411
3714 Beecher Rd.	5/14/15	1	L	C,P	8	0.15	64283
912 Lexington Ave.	5/15/15	1	L	P	6	N.D.	64285
349 Robbie Ln.	5/31/15	1	L	P	2	N.D.	67428
353 Robbie Ln.	5/30/15	1	L	C,P	5	0.11	67427
341 Robbie Ln.	5/31/15	1	L	C,P	3	0.05	67426
328 Robbie Ln.	5/30/15	1	L	C,P	2	0.09	67425
357 Robbie Ln.	5/31/15	1	L	C	3	0.20	67424
344 Robbie Ln.	5/31/15	1	L	C,P	4	0.11	67423
1807 Oren Ave.	6/8/15	1	L	P	21	N.D.	68023
421 Lyon St.	6/14/15	1	L	C,P	7	0.14	68788
1528 Delaware Ave.	6/12/15	1	L	P	3	N.D.	68789
3811 Brentwood Dr.	6/14/15	1	L	P	42	N.D.	68790
1615 S. Franklin Ave.	6/14/15	1	L	P	N.D.	N.D.	68791
853 E. 7th St.	6/12/15	1	L	C,P	7	0.07	68792
1150 Woodside Dr.	6/14/15	1	L	P	29	N.D.	68793
547 Copeman Blvd.	6/15/14	1	L	P	18	N.D.	68794

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	90th percentile	Ave	Max	# > AL
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11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2114 Flushing Rd.	6/30/15	1	L	P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033
920 Stocker Ave.	6/21/15	1	L	P	1	N.D.	69622
742 Lincoln Ave.	6/19/15	1	L	P	2	N.D.	69623
3517 Bennett Ave.	6/24/15	1	L	C,P	3	0.06	69624
1730 Overhill Dr.	6/22/15	1	L	C,P	1	0.08	69625
2117 Stanford Ave.	6/23/15	1	L	C,P	5	0.08	69626
2432 Beta Ln.	6/21/15	1	L	P	N.D.	N.D.	69627
2023 Miller Rd.	6/21/15	1	L	C,P	3	0.06	69628
721 East St. Apt #2	6/25/15	4	L	C,P	10	0.16	70222
3814 Whitter	6/25/15	1	L	P	2	N.D.	70223
3120 Norwood	6/24/15	1	L	P	5	N.D.	70224
2122 Pierce St.	6/21/15	1	L	P	2	N.D.	70225
3521 Bennett Ave.	6/25/15	1	L	P	3	N.D.	70226
1602 Raspberry Ln.	6/24/15	1	L	P	N.D.	N.D.	70227
1809 Lynbrook	6/26/15	1	L	P	3	N.D.	70228
2112 Sherff	6/24/15	1	L	C,P	9	0.06	70229
1205 Blanchard Ave.	6/24/15	1	L	C,P	11	0.05	70230
860 Schafer St.	6/26/15	1	L	C,P	N.D.	0.06	70231
2110 Flushing Rd.	6/30/15	1	L	C	N.D.	0.10	71158

[1] Sample Category: Enter a number 1 through 6 to designate the category of tap sample site. For more information see *Instructions* paragraph 11, subparagraph "Sample Category."

[2] Materials used for service line and building plumbing: Enter C = copper; G = galvanized; L = lead; or P = plastic.

TO BE DETERMINED BY DEQ

	90th percentile	Ave	Max	# > AL
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Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2300 Flushing Rd.	6/29/15	1	L	C	3	0.28	71159
2130 Flushing Rd.	6/28/15	1	L	C,P	6	0.05	71160
2202 Flushing Rd.	6/29/15	1	L	C,P	2	0.06	71162
2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169

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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF DRINKING WATER AND MUNICIPAL ASSISTANCE

LEAD AND COPPER REPORT AND CONSUMER NOTICE OF LEAD RESULT CERTIFICATE FOR COMMUNITY WATER SUPPLY

Issued under authority of 1976 PA 399, MCL 325.1001 *et al.*, and Administrative Rules, as amended.
Failure to submit this information is a violation of Act 399 and may subject the water supply to enforcement penalties.

Administrative Rule R 325.10710d requires water supplies to report lead and copper monitoring information within 10 days after the end of the monitoring period. This form may be used to meet this requirement. Submit the information to the appropriate Department of Environmental Quality (DEQ) district office. For district office addresses, visit www.michigan.gov/deq and click on Locations.

1. Water Supply Name: City of Flint Water Plant
2. County: Genesee 3. WSSN: **2310**
4. Population: 99,763 5. Monitoring Period: From: 1/1/15 To: 6/30/15
6. Minimum # of Samples Required: 100 7. # of Samples Taken: 71
8. Name of Certified Laboratory: DEQ Drinking Water Laboratory

9. SAMPLE CRITERIA:

Yes	No	Explain No responses in Comments block.	
☐	☒	a. Are the same sampling points used as in the previous monitoring period?	
☐	☒	b. Are all samples from Tier 1 sites?	For more information see *Instructions* paragraph 11, subparagraph "Sample Category."
☒	☐	c. Are all samples from Tier 1, 2, or 3 sites giving Tier 1 priority?	
☒	☐	d. If no Tier 1, 2, or 3 sites are available, do all sites have plumbing materials commonly found at other locations in the system?	
☒	☐	e. Is the minimum number of lead service line samples taken (when applicable)?	

Comments:
A total of 175 sample bottles and instructions were distributed to city residents. We are continuing to solicit samples due to the fact that we did not reach the minimum number for this monitoring period.

10. NAME:

Name: Michael Glasgow

Title: Utilites Administrator Phone: 810-766-7135 Date: 7/28/2015

11. TAP SAMPLING DATA: (Use additional sheets as needed)

Water Supply Name/County City of Flint Water Plant WSSN 2310

RESULTS:

Sample Location	Sample Date	Sample Category[1]	Service Lines[2]	Bldg Plumb-ing[2]	Lead (ppb)	Copper (ppb)	Lab #
2205 Flusing Rd	2/15/15	1	L	C,P	N.D.	0.13	54663
212 Browning Ave.	2/18/15	1	L	P	104	N.D.	54945
1809 Stevenson St.	2/10/15	1	L	P	10	N.D.	54956
4202 Custer Ave.	3/4/15	1	L	C,P	6	0.27	56223
401 E. Newall St.	3/2/15	1	L	P	5	N.D.	56225
215 Browning Ave.	3/21/15	1	L	C,P	N.D.	0.16	56226
2615 Trumbull Ave.	2/27/15	1	L	C,P	3	N.D.	56227
201 Browning Ave.	3/5/15	1	L	P	N.D.	N.D.	56228
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1220 Decker St.	3/17/15	1	L	P	4	N.D.	57730
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625 S. Grand Traverse	5/18/15	5	L	C,P	20	0.14	64284
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2429 Flushing Rd.	6/30/15	1	L	C,P	N.D.	0.06	71163
4013 Brownell Blvd.	6/29/15	1	L	C,P	2	0.08	71165
2414 Flushing Rd.	6/30/15	1	L	P	N.D.	N.D.	71166
1914 Penbrook Ln	6/29/15	1	L	P	2	N.D.	71167
3901 Leedra St.	6/26/15	1	L	P	N.D.	N.D.	71168
3142 McClure	6/26/15	1	L	P	3	N.D.	71169
2114 Flushing Rd.	6/30/15	1	L	C,P	5	0.05	71170
709 Frost St.	6/30/15	1	L	P	2	N.D.	72033

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	90th percentile	Ave	Max	# > AL
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Cu				

Consumer Notice of Lead Result in Drinking Water

Water Supply Name:	City of Flint		
County:	Genesee	WSSN:	2310
Sample Location:	401 E. Newall St.	Date Sampled:	3/2/15

Thank you for participating in the lead and copper monitoring of drinking water. The levels of lead and copper found at your location are in the table below.

Key to Table	Contaminant	AL	MCLG	Your Result
Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. **Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety. ppb: parts per billion or micrograms per liter.	Lead (ppb)	15	0	5
	Copper (ppb)	1300	1300	Not Detected

Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and it can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

To reduce exposure to lead in drinking water:

- *Run your water to flush out lead.* Run the water until it becomes cold.
- *Use cold water for cooking and preparing baby formula.* Do not cook with or drink water from the hot water tap; lead dissolves more easily in hot water.
- *Do not boil water to remove lead.* Boiling water will not reduce lead levels.
- *Look for alternative sources or treatment of water.* If your lead result is above 15 ppb, you may want to consider purchasing bottled water or a water filter. Read the package to be sure the filter is approved to reduce lead or contact NSF International at 800-NSF-8010, or www.nsf.org for information on performance standards for water filters.
- *Identify if your plumbing fixtures contain lead.* New faucets, fittings, and valves, may contain up to 8 percent lead including those advertised or labeled as "lead-free" and may contribute lead to drinking water. Consumers should be aware of this when choosing fixtures and take appropriate precautions.

Although the primary sources of lead exposure for most children are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil, the U.S. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

For more information, contact us at: City of Flint Water Plant (810) 787-6537.
For more information on reducing lead exposure around your home and the health effects of lead, visit the U.S. EPA's Web site at www.epa.gov/lead, call the National Lead Information Center at 800-424-LEAD, or contact your health care provider.

Certification: WSSN: 2310

I certify that this public water supply has provided the consumer notice of lead result to persons served at each of the taps that was tested, either by mail or by another method approved by the DEQ, within 30 days of knowing the result. The Notice includes required content.

Signature	Title	Date Sent to Consumer
Michael Glasgow	UTILITIES ADMINISTRATOR	3/17/15

Reminder to water supplier: Complete this certification on only one (1) example copy of a notice sent to a consumer and submit it to the DEQ.

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
LF58413

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:	778 E BUNDY AVE,FLINT	Source:	TYPE I	
Collected By:	SANDRA HULL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/24/2015	06:25
Sample Point:	MAIN BATHROOM	Date Received:	03/31/2015	11:11
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 #
Copper	Not detected	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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
LF58414

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:	3714 BEECHER RD,FLINT	Source:	TYPE I	
Collected By:	MELISSA MAYS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/24/2015	06:30
Sample Point:	KITCHEN	Date Received:	03/31/2015	11:11
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 #
Copper	0.52	04/01/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	04/01/2015	0.001	0.015	EPA 200.8	7439-92-1

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
LF59749

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:	1016 INGLESIDE AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JAMES D JARVIS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/09/2015	07:00
Sample Point:	KITCHEN	Date Received:	04/14/2015	11:07
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 #
Copper	0.07	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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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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USEPA Region V Drinking Water Cert. No. MI00003
P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-8184
FAX: (517) 335-8662

Sample Number
LF59750

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:	1818 ROCK CREEK LN,FLINT	Source:	Single Family Dwelling	
Collected By:	HELEN HUNTER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/06/2015	06:50
Sample Point:	MAIN BATHROOM	Date Received:	04/14/2015	11:07
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 #
Copper	0.11	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF59751

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:	3010 CHEYENNE ST,FLINT	Source:	Single Family Dwelling	
Collected By:	GERTRUDE MARSHALL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/03/2015	08:50
Sample Point:	KITCHEN	Date Received:	04/14/2015	11:07
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 #
Copper	0.10	04/15/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	04/15/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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

Sample Number
LF61845

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:	2020 CROOKED LN,FLINT	Source:	Single Family Dwelling
Collected By:	TRACY & M IKE SARGENT	Site Code:	
Township/Well#/Section:	//	Collector:	Private Citizen
County:	Genesee	Date Collected:	04/24/2015 07:00
Sample Point:	KITCHEN	Date Received:	05/04/2015 10:21
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 #
Copper	0.10	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF61846

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:	310 E MOORE ST,FLINT	Source:	Single Family Dwelling	
Collected By:	HUSTON BOLDEN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/22/2015	07:00
Sample Point:	KITCHEN	Date Received:	05/04/2015	10:21
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 #
Copper	Not detected	05/05/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	05/05/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF67423

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:	344 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	CASSANDRA BROWN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:15
Sample Point:	BATHROOM	Date Received:	06/11/2015	10:51
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 #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF67424

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:	357 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	FRANK EVANS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	0.20	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF67425

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:	328 ROBBIE LN, FLINT	Source:	Single Family Dwelling	
Collected By:	WILLIE TURNER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/30/2015	06:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	0.09	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

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

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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
LF67426

Official Laboratory Report

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

System Name/Owner:	CITY OF FLINT	WSSN/Pool ID:		
Collection Address:	341 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	FLORISSA STEBBINS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	06:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	0.05	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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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

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

Sample Number
LF67427

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:	353 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	ZETAN EVANS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/30/2015	06:45
Sample Point:	BATHROOM	Date Received:	06/11/2015	10:51
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 #
Copper	0.11	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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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810 257-3603

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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
LF67428

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:	349 ROBBIE LN,FLINT	Source:	Single Family Dwelling	
Collected By:	DORIS NUNN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/31/2015	08:00
Sample Point:	KITCHEN	Date Received:	06/11/2015	10:51
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 #
Copper	Not detected	06/12/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	06/12/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF63410

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:	631 ALVORD AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JANICE BERRYMAN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/06/2015	07:00
Sample Point:	MAIN BATHROOM	Date Received:	05/13/2015	11:26
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 #
Copper	Not detected	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.042	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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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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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) 335-8662

Sample Number
LF63411

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:	216 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	DEB	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/07/2015	08:00
Sample Point:	KITCHEN	Date Received:	05/13/2015	11:26
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 #
Copper	0.31	05/14/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.022	05/14/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF59748

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:	212 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LEEANNE WALTERS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	04/02/2015	08:00
Sample Point:	PRE P O S FILTER	Date Received:	04/14/2015	11:07
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.11	04/16/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.707	04/16/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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

Sample Number
LF54663

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:	2205 FLUSHING RD,FLINT	Source:	TYPE I
Collected By:	CHRIS BEATENHEAD	Site Code:	
Township/Well#/Section:	//	Collector:	Public Water Supply Operator
County:	Genesee	Date Collected:	02/15/2015 06:00
Sample Point:	KITCHEN	Date Received:	02/17/2015 10:47
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 #
Copper	0.13	02/18/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	02/18/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF56223

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:	4202 CUSTER AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	JACQUELINE PEMBERTON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/04/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	0.27	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF56224

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:	212 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LEEANNE WALTERS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/03/2015	06:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.397	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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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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TEL: (517) 335-8184
FAX: (517) 335-8562

Sample Number
LF56225

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:	401 E NEWALL ST,FLINT	Source:	Single Family Dwelling	
Collected By:	MARK CROMWELL SR	Site Code:		
Township/Well#/Section:	//	Collector:	Other	
County:	Genesee	Date Collected:	03/02/2015	09:30
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.005	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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FAX: (517) 335-8562

Sample Number
LF56226

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:	215 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	KEVIN & JENNIFER STARNES	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/02/2015	06:30
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	0.16	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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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
810 257-3503

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

Sample Number
LF56227

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:	2615 TRUMBULL AVE, FLINT	Source:	Single Family Dwelling	
Collected By:	JENNIFER PEDERSON	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/27/2015	10:00
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.003	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF56228

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:	201 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	FLOYD BELL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/05/2015	09:30
Sample Point:	KITCHEN	Date Received:	03/06/2015	11:33
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 #
Copper	Not detected	03/10/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	03/10/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF54945

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:	212 BROWNING AVE,FLINT	Source:	TYPE I	
Collected By:	LEANNE WALTERS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/18/2015	07:15
Sample Point:	KITCHEN	Date Received:	02/19/2015	11:13
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 #
Copper	Not detected	02/20/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.104	02/20/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF54946

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:	1809 STEVENSON ST,FLINT	Source:	TYPE I	
Collected By:	MIKE TAYLOR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	02/10/2015	06:30
Sample Point:	KITCHEN SINK	Date Received:	02/19/2015	11:13
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 #
Copper	Not detected	02/20/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.010	02/20/2015	0.001	0.015	EPA 200.8	7439-92-1

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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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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
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FAX: (517) 335-8562

Sample Number
LF57728

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:	1224 DECKER ST,FLINT	Source:	Single Family Dwelling	
Collected By:	LOU ANNE MALIS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/17/2015	06:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.10	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.013	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF57729

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:	212 BROWNING AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	MIKE GLASGOW	Site Code:		
Township/Well#/Section:	//	Collector:	Public Water Supply Operator	
County:	Genesee	Date Collected:	03/18/2015	11:10
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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
LF57730

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:	1220 DECKER ST,FLINT	Source:	Single Family Dwelling	
Collected By:	CARMEN PULIDO	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/17/2015	06:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.004	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

Sample Number
LF57731

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:	1379 WASHINGTON,FLINT	Source:	Single Family Dwelling	
Collected By:	ROXANNE PUTMAN	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/19/2015	08:30
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

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MCL : Maximum Contaminant Level
AL : Action Level
RL : Reporting Limit

mg/L : milligrams / Liter (ppm)
ppm : parts par 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
LF57732

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:	1383 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	ANTHONY PALLADENO	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/09/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.16	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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FAX: (517) 335-8562

Sample Number
LF57733

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:	1372 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	ANTHONY PALLADENO JR	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/19/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.14	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.002	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF57734

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:	1383 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	ANTHONY PALLADENO III	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/19/2015	08:00
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.17	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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

Sample Number
LF57735

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:	1367 WASHINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LEAH PALLADENO	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/17/2015	06:00
Sample Point:	MAIN BATHROOM	Date Received:	03/24/2015	11:05
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 #
Copper	Not detected	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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Flint, MI 48502-1540
810 257-3603

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

Sample Number
LF57736

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:	1701 MARQUETTE DR,FLINT	Source:	Single Family Dwelling	
Collected By:	CHARMA DOMPREH	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	03/14/2015	09:40
Sample Point:	KITCHEN	Date Received:	03/24/2015	11:05
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 #
Copper	0.19	03/25/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.001	03/25/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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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
LF68791

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:	1615 S FRANKLIN AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	VIVAN GRIER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	09:45
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	Not detected	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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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)
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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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Sample Number
LF68792

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:	853 E 7TH ST,FLINT	Source:	Single Family Dwelling	
Collected By:	LAURA STUDACHER	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/12/2015	06:30
Sample Point:	BATHROOM	Date Received:	06/19/2015	11:02
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 #
Copper	0.07	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.007	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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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

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

Sample Number
LF68793

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:	1150 WOODSIDE DR,FLINT	Source:	Single Family Dwelling	
Collected By:	DEBORAH CONRAD	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	07:30
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.029	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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Laboratory Contacts
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Systems Mgmt. Unit Mgr: George Krisztian

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FAX: (517) 335-8562

Sample Number
LF68794

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:	547 COPEMAN BLVD,FLINT	Source:	Single Family Dwelling	
Collected By:	LINDA LEE	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/14/2015	09:00
Sample Point:	KITCHEN	Date Received:	06/19/2015	11:02
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 #
Copper	Not detected	06/22/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.018	06/22/2015	0.001	0.015	EPA 200.8	7439-92-1

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

Sample Number
LF68023

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:	1807 OREN AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	MARK RUSSEL	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	06/08/2015	07:30
Sample Point:	BATHROOM	Date Received:	06/16/2015	11:11
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 #
Copper	Not detected	06/17/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.021	06/17/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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

Sample Number
LF64282

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:	625 S GRAND TRAVERSE,FLINT	Source:	TYPE III	
Collected By:	MIKE GLASGOW	Site Code:		
Township/Well#/Section:	//	Collector:	Public Water Supply Operator	
County:	Genesee	Date Collected:	05/15/2015	13:00
Sample Point:	BATHROOM	Date Received:	05/20/2015	11:24
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.017	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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
LF64283

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:	3714 BEECHER RD,FLINT	Source:	Single Family Dwelling	
Collected By:	MELISSA MAYS	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/14/2015	06:00
Sample Point:	MAIN BATHROOM	Date Received:	05/20/2015	11:24
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 #
Copper	0.15	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.008	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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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810 267-3603

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Systems Mgmt. Unit Mgr: George Krisztian

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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
LF64284

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:	625 S GRAND TRAVERSE,FLINT	Source:	TYPE III	
Collected By:	MIKE SARGENT	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/18/2015	08:30
Sample Point:	UTILITY SINK	Date Received:	05/20/2015	11:24
Water System:	Treated Public Distribution System	Purpose:	Other	

TESTING INFORMATION			REGULATORY INFORMATION			
Analyte Name	Result (mg/L)	Date Tested	RL (mg/L)	MCL/AL (mg/L)	Method	CAS #
Copper	0.14	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.020	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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630 South Saginaw
Flint, MI 48502-1540
810 257-3603

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mg/L : milligrams / Liter (ppm)
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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

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
LF64285

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:	912 LEXINGTON AVE,FLINT	Source:	Single Family Dwelling	
Collected By:	LAURA HATT	Site Code:		
Township/Well#/Section:	//	Collector:	Private Citizen	
County:	Genesee	Date Collected:	05/15/2015	09:00
Sample Point:	MAIN BATHROOM	Date Received:	05/20/2015	11:24
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 #
Copper	Not detected	05/21/2015	0.05	1.3	EPA 200.8	7440-50-8
Lead	0.006	05/21/2015	0.001	0.015	EPA 200.8	7439-92-1

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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MPN : Most Probable Number
CFU : Colony Forming Unit

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Drinking Water Unit Mgr: Julia Pieper
Systems Mgmt Unit Mgr: George Krisztian

lead/copper

Inbox x

Rosenthal, Adam (DEQ) <ROSENTHALA@michigan.gov> Jul 9
to me

Morning Mike, do you have a count on how many lead/copper samples were turned in? I know they all haven't been run at the lab yet, but if I can verify how many there will be, that would be good. So far I have 70 results and the City is below the AL for lead – current 90th = 13 ppb. All the copper results are below.

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

For MORs, Lab Results & Reporting Forms:
DEQ-DWMA-Lansing@michigan.gov

Michael Glasgow <mglasgow@cityofflint.com> Jul 9
to Brent, Adam

Adam,

I just sent the last of the samples to the lab today. Unfortunately we did not reach 100 samples. I believe the count I have is 76 total. Since we have had a few more hits this round, we are going to continue to solicit samples for our own informational purposes. I am disappointed in the turnout of sampling, we distributed close to 200 sample bottles. With this monitoring violation will we be required to collect another round of 100 samples?

Also, I have attached a copy of our June bromate test results.






June 2015 Brom...

Rennaker, Joanne (DEQ)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, September 11, 2015 3:42 PM
To: Benzie, Richard (DEQ); Busch, Stephen (DEQ)
Subject: FW: Flint Pb Conversation

FYI

Liane J. Shekter Smith, P.E., Chief
Office of Drinking Water and Municipal Assistance
Michigan Department of Environmental Quality
517-284-6543

From: Groetsch, Kory J. (DCH)
Sent: Friday, September 11, 2015 3:38 PM
To: Dawn Hallwood (dhallwood@gchd.us)
Cc: Shekter Smith, Liane (DEQ); Dykema, Linda D. (DCH)
Subject: Flint Pb Conversation

Hi Dawn,

Thank you for taking a few minutes to talk with me today. As discussed, MDEQ and MDHHS are talking about communication options to conduct health education to Flint residents about sources of lead (Pb) exposure.

We would like to have an idea-generating discussion with Genesee Co. Health Department about this topic.

Thank you for considering my request, and please let me know if you would like me to set up a conference call to discuss ideas.

Best Regards,

Kory Groetsch, MS , Manager
Toxicology and Response Section
Michigan Dept of Health and Human Services (MDHHS)
201 Townsend St.
Lansing, MI 48913
517-335-9935
groetschk@michigan.gov

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Rennaker, Joanne (DEQ)

From: Prysby, Mike (DEQ)
Sent: Wednesday, March 27, 2013 3:12 PM
To: Busch, Stephen (DEQ)
Subject: FW: Flint River as a Source
Attachments: Flint WTP Report Revised August 29, 2011.pdf

Here's the Flint WTP 2011 report – all 91 pages of it....I am going through it looking for the high points

Michael Prysby, P.E.
District Engineer
Office of Drinking Water and Municipal Assistance
517 335-6122

From: Brent Wright [mailto:bwright@cityofflint.com]
Sent: Wednesday, March 27, 2013 3:01 PM
To: Prysby, Mike (DEQ)
Subject: Flint River as a Source

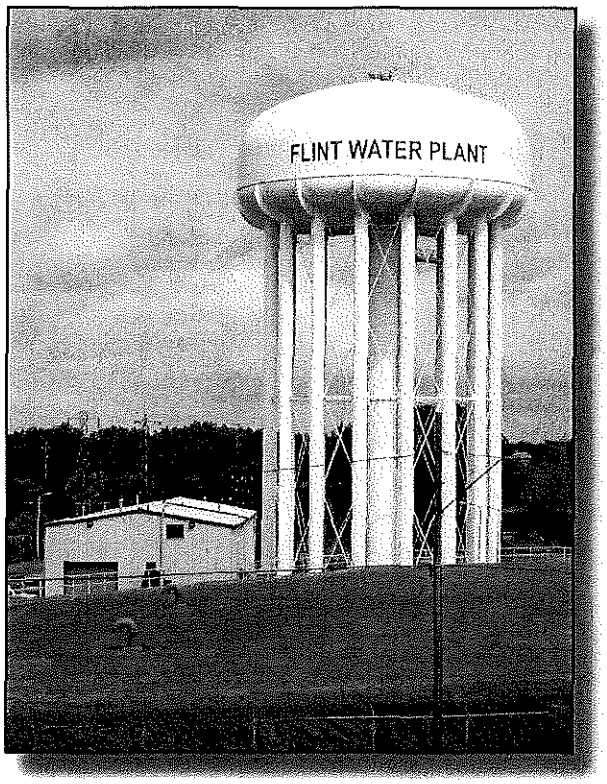
Hope this works...Brent

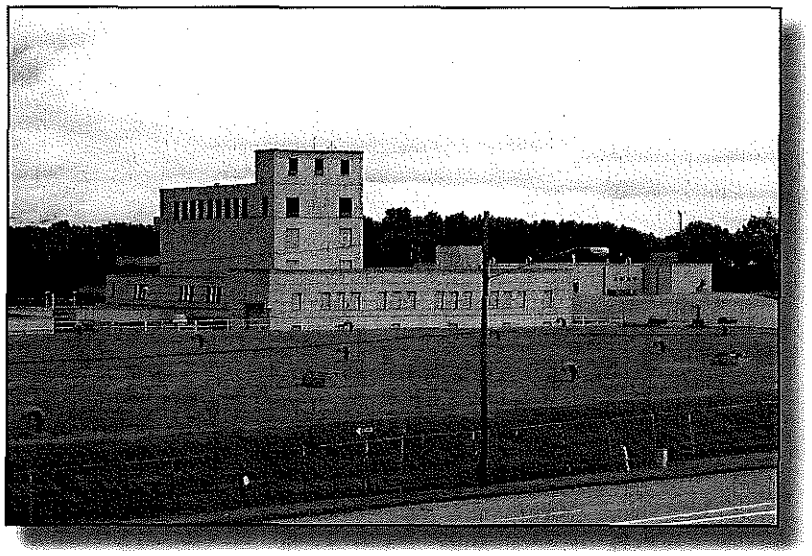
July 2011

Analysis of the Flint River as a Permanent Water Supply for the City of Flint

Prepared for:

City of Flint
1101 S. Saginaw Street
Flint, MI 48502
(810) 766-7346





ROWE

LAN

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8. Cost of Service Study – Flint Water Treatment Plant

I. Purpose

This study evaluates the feasibility of utilizing the City of Flint's Water Treatment Plant (WTP) and Flint River as the primary water supply for the City of Flint. The study evaluates whether the Flint River is an adequate source of water for the City of Flint and identifies upgrades needed to reliably supply water on a continuous basis.

II. History

The City of Flint's WTP was constructed in 1917 and supplied water to city customers for drinking and industrial uses. Records indicate that Flint supplied approximately 16 mgd in 1940 and that by the mid-1950s water use had increased to about 45 mgd. This significant increase coincided with increases in automobile production and population in the area. The Holloway Reservoir was constructed in 1954 to increase water supply capacity to meet the growing demand. Because of continued concerns regarding the adequacy of the Flint River for meeting the future water supply needs of the area, the city evaluated alternatives for a new water supply and ultimately contracted with the City of Detroit in 1967 for water supply. Detroit continues to supply water to Flint and its customers today. Detroit supplies finished water to the city via a single transmission pipeline. For reliability, the city's WTP has been maintained as a backup water supply in the event of a disruption to the single supply pipeline.

Because of recent concerns with the cost and reliability of the existing water supplies, the City of Flint, Genesee County, Lapeer County, the City of Lapeer, and Sanilac County are evaluating alternatives for their long-term water supply. The most recent study (Preliminary Engineering Report, Lake Huron Supply, Karegnondi Water Authority; September 2009) focused on two primary alternatives: Alternative 1 – continued supply by Detroit, and Alternative 2 – development of a new Lake Huron water supply. This study evaluates a third alternative. Alternative 3 provides for utilizing the existing City of Flint WTP to treat water from the Flint River. Alternative 3 assumes that water will be supplied only to customers within the city.

To evaluate the feasibility of Alternative 3, the river and WTP will be examined to determine their ability to supply water in sufficient quantity meeting current and anticipated regulations. There have been many new rules and regulations for treatment of surface water since 1967 when Flint's WTP was last used as a primary water supply.

III. Regulatory Requirements for Quantity of Source Water

Regulations require that the quantity of water at the source shall:

- Be adequate to meet the maximum projected water demand of the service area as shown by calculations based on a one in fifty year drought or the extreme drought of record, and should include consideration of multiple year droughts. Requirements for flows downstream of the intake shall comply with requirements of the appropriate reviewing authority.
- Provide reasonable surplus for anticipated growth.
- Be adequate to compensate for all losses such as silting, evaporation, seepage, etc.
- Be adequate to provide ample water for other legal users of the source.

IV. Demands

The alternative of utilizing the city's WTP and Flint River as a water supply will be evaluated on the basis of supplying water to Flint's direct customers only. Although Flint currently supplies water to GCDC-WWS, for this analysis it is assumed that GCDC-WWS receives its primary water supply by another source. Table 1 summarizes the city's current and projected demands for direct customers of the city. Projections have been provided by city representatives.

Table 1: City Customer Demand Summary

	2010		2035	
Average Day Demand (ADD)	14.0	mgd	15.0	mgd
Maximum Day Demand (MDD)	17.5	mgd	18.0	mgd

Actual water requirements will be greater than the amount of water provided to customers. About ten percent additional water must be added for treatment processes and system operation. Water for fire-fighting is not included in customer demands and must be added to the quantity of water needed.

Surface water sources must be adequate to supply water through a drought period. Although the MDD is projected to be 18 mgd, the sustained maximum demand over a longer period will be less than the MDD. Analysis of records of water use indicates that the 30-day sustained maximum demand is about 80% of the MDD. Table 2 summarizes the source water requirements to supply the city's future needs.

Table 2: Source Water Requirements

Future Maximum Day Demand (Customers)		18.0 mgd
Future Maximum Day Demand (WTP Backwash / Process Water)		2.0 mgd
Subtotal (Future Maximum Day Demand)		20.0 mgd
Sustained (30 day) Future Maximum Day Demand	(80% of MDD)	16.0 mgd
Replenish Water from Fire Fighting		0.7 mgd
Future Maximum Day Demand (Source Water)		16.7 mgd

V. Drought Flows

USGS records indicate that the most severe drought in Michigan occurred between 1930 and 1937, and that the low stream flows experienced during this period have a recurrence interval of 50 to 70 years. River flow records which include the drought of the 1930s will be used to evaluate the adequacy of the river as a permanent water source.

VI. Reservoir Losses

Both the Holloway Dam and Mott Dam were constructed since the drought period of the 1930s. If used to simulate the "design drought conditions", the records of flow on the Flint River from the 1930's should be adjusted for potential impact from the addition of these two dams and resulting reservoirs.

A. Evaporation

If the two reservoirs had existed during the drought period, the flows in the river would have been a little less because of the volume of water which would have been lost to evaporation from these two bodies of water.

B. Sedimentation

The July 2001 Flint River Assessment completed by the MDNR indicates that sedimentation occurs in the Holloway Reservoir at an accelerated rate, but does not provide specific volumes. Sedimentation reduces the storage volume of reservoirs. No investigation to determine the amount of sedimentation has been completed in the Holloway Reservoir since its construction, but the storage volume of the reservoir has certainly decreased since its construction.

Mott Dam maintains a fixed water level, so storage for water supply is not available. Therefore, sedimentation in Mott Lake is not a concern with respect to water supply.

C. Seepage

The land adjacent to both the Holloway Reservoir and Mott Lake has a relatively high groundwater table. Any loss of water by seepage from the bottom of the reservoirs seems likely to flow back to the river downstream of the respective dams, resulting in little or no impact to the quantity of water available for water supply or flow augmentation. Loss from the reservoirs by seepage is not considered a significant factor.

VII. Other Water Uses

Since 1967 when Detroit began supplying water to Flint, the Holloway Reservoir has been utilized as a backup water source, source of flow augmentation for the river, and for recreational purposes. Although the city maintains control over the dam and water levels; the city has leased their surrounding lands to the Genesee County Parks and Recreation Commission (GCPRC) for park, recreational, and conservation purposes. In 1987, the city and GCPRC adopted the Holloway Reservoir Management Plan (HRMP) which defined how water levels in the reservoir were to be maintained to achieve the goals above. The HRMP establishes a summer water level of 755 and a winter level of 751. Discharge from the reservoir is to be maintained above 65 cfs except when the level is less than 751; outflow from the reservoir is not to exceed inflow to the reservoir. A copy of the HRMP is included in Appendix 1.

Flow augmentation for the city's WWTP discharge is another consideration. The city's NPDES permit for their WWTP indicates that a Flint River drought flow of 85 cfs was used to determine the permitted limits for WWTP effluent. It appears that the HRMP requirement to maintain a 65 cfs minimum at the Holloway Reservoir was established to provide adequate flow in the river at the city's WWTP outfall. An excerpt of the city's WWTP NPDES permit is included Appendix 2.

The existing water supply contract between the city and Genesee County Drain Commissioner Division of Water and Waste Services (GCDC-WWS) provides that both the city and GCDC-WWS supply the other up to 8 mgd of finished water in the event of an emergency or supply disruption. For this analysis, it is assumed that the Flint WTP and river must be able to supply 8 mgd to GCDC-

WWS in the event of an emergency in addition to the quantity consumed by the city's water customers. The need to provide backup to GCDC-WWS is assumed to be limited to a period of two weeks. Over a 14 day period, 125 million gallons of water should be reserved to meet the commitment for an emergency supply.

VIII. Analysis of Adequacy of Flint River

A detailed analysis of the adequacy of the Flint River as a water supply source is included in Appendix 3. This section provides an overview.

In 1977 when the HRMP was executed, water was not withdrawn from the Flint River for water supply. In 1977 without any withdrawal for water supply, the HRMP provided for a minimum discharge of 65 cfs from the Holloway Reservoir, to provide for a river flow of 85 cfs at the city's WWTP. If water is withdrawn from the river for water supply, the minimum flow from the reservoir must be increased by the rate of WTP withdrawal if the 85 cfs base flow is to be maintained at the city's WWTP. With Flint's future sustained demand estimated to be 16.7 mgd (26 cfs), a minimum flow of 91 cfs (65 cfs + 26 cfs) will be needed from the Holloway Reservoir to maintain the 85 cfs base flow at the WWTP.

The United States Geological Survey (USGS) in a 1963 report Water Resources of the Flint Area Michigan examined the Flint River as a water supply for Flint. Using river flow records between 1930 and 1952, the USGS report includes a Draft-Storage curve for the Holloway Reservoir. If a minimum discharge of 91 cfs is to be maintained during a drought period, 6.2 billion gallons water would need to be withdrawn from the reservoir to supplement natural river flow.

In addition to the 6.2 billion gallons of storage to maintain the existing rates of flow in the river plus water supply, additional storage is required to provide GCDC-WWS an emergency supply and to make up for reservoir losses. The following table summarizes the total storage needed.

Table 3: Storage Requirements

Storage to meet sustained demand and WWTP flow	6.20	billion gallons
Storage to provide backup supply to GCDC-WWS	0.11	billion gallons
Storage to make up loss by evaporation	0.90	billion gallons
Storage lost by siltation	0.64	billion gallons (assumed)
Storage to provide loss by seepage	0.00	billion gallons
Storage Needed to Supplement River Flow	7.85	billion gallons

To provide 7.85 billion gallons of storage, the Holloway Reservoir operating level must be raised by at least three feet to 758 feet. Although possible, there are many challenges associated with operating the Holloway Reservoir at the 758 feet level.

- The existing drum gates used to control reservoir level are designed for adjustment over a four feet range (751 feet to 755 feet). The design of the dam is such that the existing gates cannot simply be replaced with larger ones to increase the upper level to 758 feet. The dam spillway will likely need to be reworked to accommodate the larger drum gates. Drawings showing the details of the dam are included in Appendix 4.

- Although operation at the 758 water level provides five feet of freeboard to the top of the dam, the watershed contributing to the reservoir is quite large and has resulted in quick increases in the reservoir level during extreme rain events. The reduction in freeboard will result in a reduced safety factor for managing flood events.
- Seepage through the earthen dam embankment will increase as a result of the increased hydraulic pressure with the higher water level. Increased seepage through the dam's embankment will reduce the strength and integrity of the embankment and is likely to increase maintenance needs.
- The 758 feet water level is based on an assumption regarding the loss of the reservoir volume by siltation. The depth of siltation should be measured to better determine the quantity of siltation and its impact on storage and reservoir level.
- Recreational activities, the fishery, and adjacent properties will be impacted by use of the reservoir for water supply. Normal water levels will be increased by three feet and during dry periods, the water levels may vary by several feet. During an extreme drought period, water levels may be as much as 11 feet below normal levels.
- If the 85 cfs drought flow at the city's WWTP cannot be achieved, a new NPDES permit with stricter discharge limits may issued by the MDEQ. This could result in higher WWTP costs for the city.

Analysis shows that without modification, the Holloway Reservoir can support a sustained maximum day demand of 11.6 mgd for water supply through a drought period.

IX. Dams

If the Flint River is to be used as water supply, existing dams will continue to be critical for management of the flows in the river and water supply. Following is a summary of the dams on and adjacent to the river.

Table 4: Summary of Dams

Facility	Construction Completed	Catchment Area (sq. mi.)	Surface Area (Acres)	Storage (Acre-Feet)	Ownership	Hazard Classification	Condition
Holloway Dam	1954	523	1,973	17,678	Flint	High	Good
Mott Dam	1972	612	684	0	GCPRC		Good
Kearsley Dam	1929	115	175	2,000	Flint	Significant	Satisfactory
Utah Dam	1928	729		0	Flint	Low	Poor
Hamilton Dam		748	17		Flint	High	Poor
Thread Creek Dam	1973	63	80	320	Flint	Significant	Poor

A. Holloway Dam

The Holloway Dam was last inspected in 2008 and was reported to be in good condition. A copy of the 2008 Dam Safety Report is included in Appendix 5. Other than routine maintenance, the following upgrades / modifications are recommended to provide a water supply of up to 11.6 mgd:

- Replacement of drum gate bearings
- Installation of river flow gage on North Branch of Flint River
- Improved instrumentation to measure and monitor gate positions and water surface level

If the river is to be used as a water supply of greater capacity than 11.6 mgd, additional modifications are required at the Holloway Dam to allow for operation at an increased water level. These improvements will include replacement of gates with larger ones and reworking of the dam spillway to accommodate the larger gates. The existing embankment should be armored to strengthen the dam's embankment and protect against erosion from wave action. A budget of $2.57 million is established for the upgrades to the Holloway Dam to provide adequate capacity for the projected future demands.

B. Mott Dam

The Mott Dam is under the jurisdiction of the GCPRC. The reservoir level is maintained by a fixed weir so the reservoir volume is not available for storage. The dam has been reported to be in good condition.

C. Utah Dam

Utah Dam is inoperable and in poor condition. A copy of the 2008 Dam Safety Report is included in Appendix 6. Recent studies and evaluations conclude that the dam is of little benefit and should be removed. The 2010 Hamilton Dam Modifications and Riverfront Restoration PER provides a budget of $1.9 M for removal of the Utah Dam, including replacement with a pedestrian bridge, construction of a boat launch, and local storm sewer upgrades.

D. Hamilton Dam

The Hamilton Dam is in poor condition and considered unstable. A copy of the 2008 Dam Safety Report is provided in Appendix 7. The dam has been the subject of extensive study and recommended for removal and replacement. The 2010 Hamilton Dam Modifications and Riverfront Restoration PER provides a budget of $7.1 M for the removal and replacement of the dam, including ancillary upgrades to adjacent portions of the river.

The new Hamilton Dam is proposed at a lower elevation than the existing dam to reduce potential for flooding. A reduced water level upstream of the dam will reduce the water pool depth at the WTP intake, unless the Utah Dam is replaced or another dam is added. Testing of pumps at the WTP was completed to determine the impact of a reduced water depth at the WTP intake. Allowing for two feet of loss through the WTP intake screens after operation, reduction of the height of the Hamilton Dam by 1.5 feet or more will impact WTP's ability to draw water from the river.

E. Kearsley Dam

The Kearsley Dam is reported in satisfactory condition. Although the dam is located downstream of the city's WTP, water from the dam and Kearsley Lake supplements the river flow in advance of the Hamilton Dam, therefore contributing to the impoundment from which the WTP draws water. Water from the Kearsley Creek also serves to augment river flow at the city's WWTP located further downstream.

The storage volume of Kearsley Lake is relatively minor in relation to the storage deficit from Section VIII. Supplemental flows to the river from the Kearsley Creek are included in the USGS records included in this analysis

The dam is an important component of the city's water supply system because of its potential contribution to the WTP intake. Although currently in satisfactory condition, there will be ongoing maintenance needs to be addressed.

F. Thread Lake Dam

The Thread Lake Dam is reported to be in poor condition. Flow from the Thread Creek supplements the river flow prior to the city's WWTP. The storage provided by Thread Lake is negligible and flow from Thread Creek is included in the USGS records of river flow used for this analysis.

The Thread Lake Dam remains a facility of the city which because of its poor condition needs to be addressed. However, since the dam appears to be of little benefit to the water supply considered in this analysis, a budget for upgrades or removal has not been included in the costs for water supply.

X. Source Water Quality

Since the Flint WTP is the backup water supply in the event of a disruption to the supply from Detroit, raw water at the WTP intake is regularly sampled and analyzed. Available records provide a good understanding of the characteristics of the raw water and ranges of variances, and will be helpful to design water treatment processes and estimate operating costs.

Preliminary analysis indicates that water from the river can be treated to meet current regulations; however, additional treatment will be required than for Lake Huron water. This results in higher operating costs than the alternative of a new Lake Huron supply.

Although water from the river can be treated to meet regulatory requirements, aesthetics of the finished water will be different than that from Lake Huron. As an example, the temperature of water supplied to customers during the summer will be warmer than the present Lake Huron supply, because of the increased summer temperature in the relatively shallow river.

A detailed investigation of potential sources of contamination has not been completed. The MDEQ has reported that the Richfield Landfill is considering an application for an NPDES permit to allow

for discharge of stormwater and/or treated leachate to the Holloway Reservoir. If an NPDES permit is issued, there may be an impact on the quality of source water.

If used for water supply, a source water protection management plan should be developed to study the watershed, identify potential sources of contamination, and enact safeguards to prevent or control future threats.

XI. Water Treatment

For comparison with other alternatives, it is assumed that the Flint WTP will treat water from the river to provide a finished water of similar quality to the other alternatives being considered (continued Detroit supply and new Lake Huron supply).

A review of the city's WTP has been completed (Technical Memorandum, Cost of Service Study, Flint Water Treatment Plant prepared by Lockwood, Andrews, and Newnam (LAN), dated June 2011) to evaluate its ability to treat water from the river on a continuous basis to meet current and anticipated regulations and produce high quality finished water. Details regarding this review and analysis are provided in Appendix 8.

Although the WTP has been maintained and operated as a backup water supply, there have been numerous changes in regulations and standards since the WTP last supplied water on a continuous basis. Although equipment and systems at the WTP have been used sparingly, some existing equipment and systems require replacement from deterioration or obsolescence to provide reliability for continuous operation.

Following is a summary of upgrades needed.

A. Lime Sludge Disposal

Prior to supply of water by DWSD, the city's WTP disposed of lime sludge from water treatment operations at the Bray Road disposal site. The city is working with the MDEQ to address concerns at the Bray Road site; for this study it has been assumed that new sludge handling and disposal provisions will be utilized. Lime residual handling and disposal facilities have an estimated project cost of $15.1 million. No costs have been included for remediation of the Bray Road site.

B. Soda Ash Feed System

Records of analyses of the source water indicate non-carbonate hardness. To remove the non-carbonate hardness and provide softening, soda ash should be added during treatment. The addition of a soda ash feed system has an estimated project budget of $0.5 million.

C. Chemical Storage

Bulk chemical storage of at least 30 days is needed if the plant operates on a continuous basis. New storage tanks for liquid carbon dioxide, liquid oxygen, and liquid nitrogen will be needed. The project budget for chemical storage is $2.1 million.

D. Electrical and SCADA

The power requirements of equipment at the WTP exceed the capacity of the substation which supplies the plant. Backup power generators at the WTP are not currently operable. Upgrades are recommended to power feeders for several of the existing systems. New SCADA is recommended to provide control and monitoring of operations at the WTP. The project budget for these upgrades is $8.1 million.

E. Post Chlorination and Zebra Mussel Control

Zebra mussels are an invasive shell fish which have been introduced to the Great Lakes basin, including the Flint River. Zebra mussels can obstruct pipes and water intake screens. A sodium permanganate feed system is proposed for zebra mussel control. The project budget is $0.3 million.

F. Security Issues

Additional security measures to guard against malevolent threats or terrorism which target the new water source will be required. A project budget for this is $0.3 million.

G. Pumping System Improvements (Low and High Service Pumps in PS No. 4)

The pumps are in poor condition and their capacity is not consistent with the projected demands of the city. The pumps should be replaced with new, more efficient pumps. The project budget for these is $7.8 million.

H. Filter Transfer Station to Dort Reservoir and UV Inactivation

Recent USEPA regulations require additional treatment or enhancement of existing treatment processes for microbial contaminates such as giardia, cryptosporidium, viruses, and bacteria. It is anticipated that enhanced contact time and ultraviolet light deactivation will be required to comply with these new standards. A project budget of $7.0 million is established for compliance with the new surface water treatment rules.

I. Emergency Interconnect

The GCDC-WWS and City of Flint have a mutual aid agreement providing for each to provide the other up to 8 mgd of water as a back-up supply in the event of an emergency with either system's supply. A pumping station and piping interconnect is needed to effectively complete this exchange. The project budget for these upgrades is $8.6 million.

The total of all WTP upgrades above is $49.9 million.

In addition to upgrades to the treatment plant, there will be increased operating costs associated with the continuous operation of the WTP. For comparison with other alternatives for a long-term water supply, only the additional operational costs have been determined.

- Labor – Full scale operation of the WTP and dams on a continuous basis will require additional staffing. It is estimated that labor costs will increase by $2,034,000 per year.
- Chemicals – The cost of chemicals used for water treatment are estimated at $423 per million gallons of water produced.
- Residual Disposal – Disposal costs for lime sludge is estimated to be $453,000 annually.

- Power – Increased power costs are estimated to be $104 per million gallons of water produced.
- Ozone – Ozone treatment will be needed to meet new treatment standards. A budget of $208,000 is assumed.
- Maintenance – Maintenance costs are assumed to be 20% of the O&M budget. Maintenance costs of the WTP and other facilities are expected to be relatively high because of the age of the facilities.

XII. Cost Summary

Upgrades to dams and the WTP will be needed for the Flint River to reliably supply drinking water on a continuous basis to Flint's customers. The cost of these upgrades is presented in the following table. Costs have been adjusted to an ENR Construction Cost Index of 8688 to allow for comparison with the 2009 Study. It has been assumed that design/construction commenced in 2010, to allow for comparison with the alternatives in the 2009 study.

Table 5: Project Costs

WTP Upgrades	$49,888,000
Hamilton Dam Replacement	$7,100,000
Holloway Dam /Reservoir Upgrades	$2,570,000
Utah Dam Removal	$1,900,000
Total Capital Cost	**$61,458,000**

Costs shown are based on upgrades to existing facilities to supply the projected future maximum day demand of 18.0 mgd. These upgrades are based on the assumption that the HRMP is modified to allow for operation over a greater range of water levels. Other options for supplying the projected maximum day demand will result in higher costs.

Operating costs in the initial year of operation are estimated to increase $7 million above current operating costs. Operating costs are projected to increase annually because of inflation and projected growth in demand over the study period.

Figure 1 shows the cost of water for Alternative 3, utilizing the existing WTP and Flint River for water supply. The cost of water is comprised of three components: continued purchase of water from Detroit during construction, debt for construction of facility upgrades, and ongoing operating costs.

Figure 1: Cost of Water Using Flint River as Source

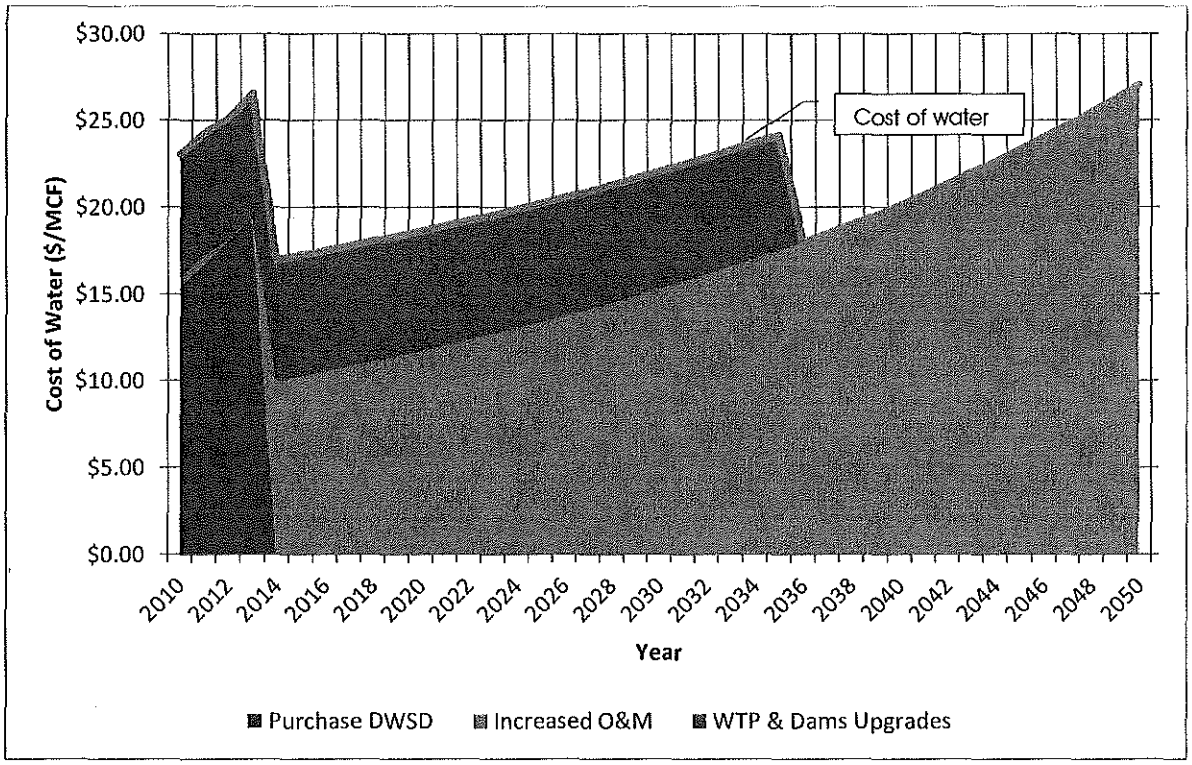
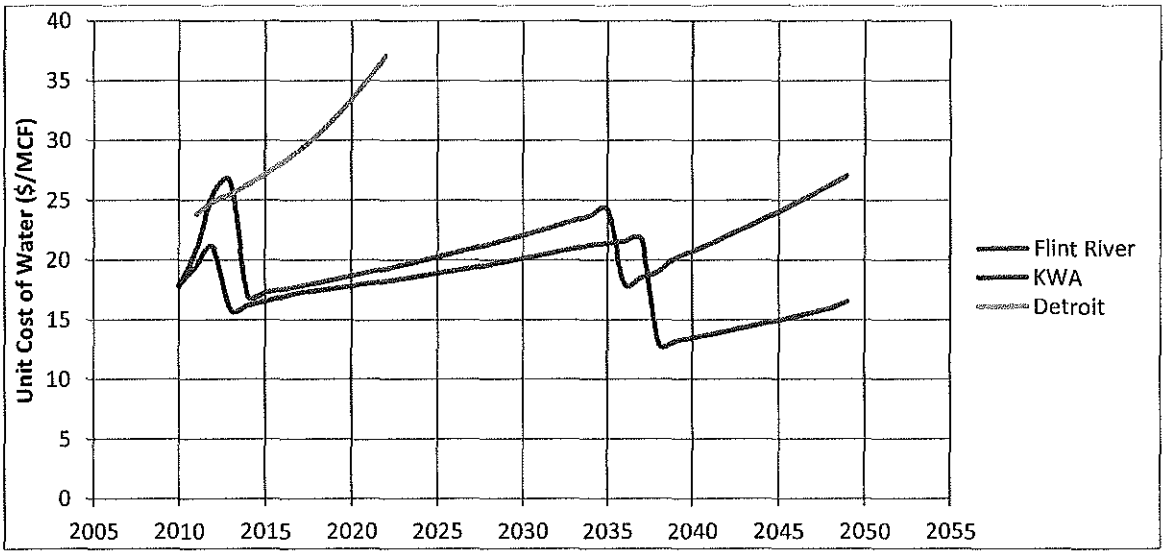


Figure 2 compares the cost of water for all three alternatives. Continued Supply by the City of Detroit results in a higher cost for water supply than the other two alternatives. The city's costs for The KWA-New Lake Huron Supply have been based upon the terms of the current KWA Raw Water Supply Contract, and the assumption that the city purchases 18 mgd capacity in the KWA system. The KWA alternative is projected to result in the lowest cost for water.

Figure 2: Comparison of Alternatives



XIII. Implementation

Planning, design, construction, and start-up will require 52 to 60 months for completion. Additional time may be required to address ancillary issues such as modifications to agreements, permits, and "non-construction related" environmental issues.

XIV. Intangibles

In addition to the upgrades identified for the dams and WTP, other issues will potentially need to be addressed if the Flint River is to be used as a water supply. Examples of these include:

- Environmental impact of work on dams or removal of sediment from the river or reservoirs
- Impact of construction and reservoir operation on the fishery
- Impact to recreational users and land owners adjacent to the Holloway Reservoir
- Potential upgrades to the city's WWTP if river flows are reduced and stricter effluent limits are included in future NPDES permits
- Impacts of the replacement of the Hamilton Dam at a lower level for improved flood control may impact the ability for the WTP to draw water from the river
- Results of a Source Water Protection Plan which may identify potential threats of contamination or other impacts to the water supply

XV. Summary

Analysis indicates that the cost of supplying water from the Flint River on a continuous basis will be greater than the proposed KWA Raw Water Supply Contract, but less than continued supplied from Detroit. Additionally, if the Flint River is to be used for a water supply for city customers, there will need to be some modifications to existing facilities, operating agreements, and permits. Upgrades will be required at the city's dams and the water treatment plant to reliably supply water to the city on a continuous basis. To meet the future maximum day demand of 18 mgd projected by city staff, one or more of the following will be required.

- Modify the Holloway Dam and Reservoir to provide additional storage
- Modify the HRMP to provide for more variance in water levels and/or modify limits on minimum discharge
- Modify the WWTP NPDES permit based on reduced flows in the river and provide resulting upgrades to WWTP for higher treatment
- Provide other raw water storage reservoirs

Addressing the preceding items is likely to require a great deal of time and effort because of the impacts on many other parties. Without making the modifications above, the river is limited to supplying a maximum day demand of about 11.6 mgd.

Appendices

1. Holloway Reservoir Management Plan
2. Excerpt of Flint WWTP NPDES permit
3. Analysis of Adequacy of Flint River as a Water Supply
4. Holloway Dam Drawings
5. 2008 Holloway Dam Safety Report
6. 2008 Utah Dam Safety Report
7. 2008 Hamilton Dam Safety Report
8. Cost of Service Study – Flint Water Treatment Plant

Appendix 1 - Holloway Reservoir Management Plan

March 13, 1987

TO: Members of the Ad Hoc Committee to Work With City of Flint Officials on Management of the Holloway Reservoir

FROM: Kenneth J. Smithee, Director
Genesee County Parks & Recreation Commission

SUBJECT: Action of the Parks & Recreation Commission

Please be advised that the recommendations as outlined on Attachment A were approved by the Genesee County Parks & Recreation Commission meeting in formal session on March 12, 1987.

On behalf of the Commission, I would like to extend our personal thanks to each of you for the assistance which you rendered which led to the agreement between the Parks & Recreation Commission and the City of Flint and will provide protection for recreational users of the Holloway Reservoir, adjacent property owners and also help protect the fish and other aquatic life.

Thanks again.

Sincerely,

Kenneth J. Smithee
Director

KJS:jp
Attachment

CITIZEN REPRESENTATIVES:

GERALD H. RIDEOUT
PRESIDENT

ARCHIE HALFORD, JR.
VICE PRESIDENT

CHARLES E. OLIVER, JR.
SECRETARY

JAMES S. SHEAFFER

GENESEE COUNTY BOARD OF COMMISSIONERS

SUSAN H. BAILEY
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EX OFFICIO MEMBERS:

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CHAIRMAN, GENESEE COUNTY METROPOLITAN PLANNING COMMISSION

RAYMOND M. NEWMAN
CHAIRMAN, GENESEE COUNTY BOARD OF ROAD COMMISSIONERS

ANTHONY RAGNONE
GENESEE COUNTY DRAIN COMMISSIONER

KENNETH J. SMITHEE
DIRECTOR

R-22

AGENDA ITEM: (5). i.

PRESENTED: 3/9/87

ADOPTED: 3/9/87

By the Mayor:

WHEREAS, the City of Flint in adopting ordinance 2208 granted to the Genesee County Parks and Recreation Commission the right to establish and operate park and recreational facilities and conservations programs on property owned by the City of Flint in the Holloway Reservoir area; reserving unto itself the power to control and regulate the dams and water levels of the Holloway Reservoir, and

WHEREAS, it is in the interests of the City and the Genesee County Parks and Recreation Commission to establish a Management Plan which optimizes the summer recreational programs available to the public while preserving downstream usages of the Flint River, and which will assist the City in implementing the provisions of ordinance 2208.

NOW, THEREFORE, BE IT RESOLVED, that the City of Flint adopts the attached Holloway Reservoir Management Plan.

APPROVED AS TO FORM:

Chief Legal Officer

R990

COUNCIL MARCH 9, 1987

HOLLOWAY RESERVOIR MANAGEMENT PLAN

GENERAL OBJECTIVE:

To operate Holloway Dam in a manner that optimizes summer recreation on the Holloway Reservoir while preserving downstream usages of the waters of the Flint River and assuring availability of a back-up water supply for Flint.

GENERAL OPERATING PROCEDURE:

Spring Fill - The City of Flint shall operate the dam with the intention of capturing a sufficient quantity of spring run-off to maintain the reservoir at a minimum elevation of 755 feet no later than May 1 of each year.

Summer Operation - The City of Flint shall maintain a minimum outflow of 65 cfs until the level of the reservoir falls to an elevation of 752.7 feet. At any time that the level reaches elevation 752.7 feet the city shall operate the dam such that the outflow does not exceed inflow, on any given day, provided, however, that the city shall not be obligated to make more than one adjustment to flow during any given day.

Winter Drawdown - The City of Flint shall operate the dam to gradually drawdown the reservoir during the first two weeks of November to an elevation of 751 feet in order to prevent structural damage to the dam from freezing.

Notification - The City of Flint shall provide prior notification to the Genesee County Parks and Recreation Commission before making a change in dam operations which result in significant drawdown.

Maintenance and Construction - Routine maintenance shall be scheduled to avoid conflicts with major events and peak usage periods on the reservoir. A minimum of 30 days notification shall precede all maintenance and construction involving significant drawdown. The Genesee County Parks and Recreation Commission shall promptly receive copies of all dam maintenance permit applications made by the City of Flint to the Michigan Department of Natural Resources.

Gauging of Water Flow into Reservoir - The City of Flint shall be a cooperator with the U.S.G.S. and State of Michigan to establish a stream gauge on the north branch of the Flint River upstream of the Holloway Reservoir and be a cooperator on the annual maintenance and operation of the existing gauge on the south branch of the Flint River and the new gauge on the north branch of the Flint River.

EMERGENCIES:

In emergency situations affecting public health, safety and welfare the City of Flint shall operate the Holloway dam in a manner to protect the public health, safety and welfare. This shall be done even though recreational users and others may be temporarily inconvenienced. Situations which shall be identified as emergencies shall include but not be limited to the following: flood conditions, interruption of the City of Flint's public water supply, and event(s) which threatens the structural integrity of the dam, and acts of God. However, low flow augmentation for sewage treatment shall not be considered as an emergency.

MONITORING:

The City of Flint in cooperation with the Genesee County Parks and Recreation Commission will assure conformance with the Holloway Reservoir Management Guidelines. A standing oversight committee shall be created to provide monitoring of the reservoir management and facilitate exchange of timely information regarding the Holloway dam and reservoir. The committee shall be composed of two members from both the City of Flint and the Genesee County Parks and Recreation Commission and shall meet in April and November of each year. The Genesee County Parks and Recreation Commission shall provide the City of Flint with a schedule for summer events on Holloway Reservoir at the April meeting of the Oversight Committee.

PERIOD AND EXECUTION OF AGREEMENT:

The Holloway Reservoir Management Plan shall be in full force and effect when officially adopted by the Flint City Council and the Genesee County Parks and Recreation Commission and shall remain so until altered by mutual agreement.

MANAGEMENT PLAN STATUS:

This management plan establishes targets for optimal operation of the Holloway Dam and Reservoir but does not replace the terms and conditions of Flint City Ordinance No. 2208.

p:DAM(a)

Appendix 2 - Excerpt of Flint WWTP NPDES permit

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated municipal wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the Flint River. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Frequency	Sample
Parameter	Monthly	7-Day	Daily	Units	Monthly	7-Day	Daily	Units	of Analysis	Type
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total *Daily Flow*
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)										
4/1-4/30	6,672	10,000	---	lbs/day	16	---	24	mg/l	Daily	24-Hr Composite
5/1-10/31	2,920	3,750	---	lbs/day	7	---	9	mg/l	Daily	24-Hr Composite
11/1-11/30	4,590	6,672	---	lbs/day	11	---	16	mg/l	Daily	24-Hr Composite
12/1-3/31	5,420	8,340	---	lbs/day	13	---	20	mg/l	Daily	24-Hr Composite
Total Suspended Solids										
5/1-10/31	8,340	12,500	---	lbs/day	20	30	---	mg/l	Daily	24-Hr Composite
11/1-/4/30	12,500	18,800	---	lbs/day	30	45	---	mg/l	Daily	24-Hr Composite
Ammonia Nitrogen (as N)										
4/1-4/30	2,920	4,170	---	lbs/day	7.0	---	10.0	mg/l	Daily	24-Hr Composite
5/1-10/31	667	1,460	---	lbs/day	1.6	---	3.5	mg/l	Daily	24-Hr Composite
11/1-11/30	2,080	2,920	---	lbs/day	5.0	---	7.0	mg/l	Daily	24-Hr Composite
12/1-3/31	2,500	3,128	---	lbs/day	6.0	---	7.5	mg/l	Daily	24-Hr Composite
Total Phosphorus (as P)	417	---	---	lbs/day	1.0	---	---	mg/l	Daily	24-Hr Composite
Fecal Coliform Bacteria	---	---	---	---	200	400	---	cts/100 ml	Daily	Grab
Total Residual Chlorine	---	---	---	---	---	---	0.038	mg/l	Daily	Grab
Total Mercury										
Through 12/31/2008	---	---	---	lbs/day	(report)	---	---	ng/l	Quarterly	Grab
Beginning 1/1/2009	0.0042	---	---	lbs/day	10	---	---	ng/l	Quarterly	Grab
Acute Toxicity										
Through 12/31/2008	---	---	---	---	---	---	(report)	TU_A	Quarterly	24-Hr Composite
Beginning 1/1/2009	---	---	---	---	---	---	1.0	TU_A	Quarterly	24-Hr Composite
Chronic Toxicity										
Through 12/31/2008	---	---	---	---	(report)	---	---	TU_C	Quarterly	24-Hr Composite
Beginning 1/1/2009	---	---	---	---	1.5	---	---	TU_C	Quarterly	24-Hr Composite
					Minimum Daily		Maximum Daily			
pH	---	---	---	---	6.5	---	9.0	S.U.	Daily	Grab

The following design flow was used in determining the above limitations, but is not to be considered a limitation or actual capacity: A rated design capacity of 50 MGD and the 1988 Water Resources Commission directive to use a 95 percent exceedance (Flint River drought) flow of 85 cfs (Holloway Reservoir Management Plan) for limit calculations.

Appendix 3 - Analysis of Adequacy of Flint River as a Water Supply

Technical Memorandum
Analysis of Adequacy of Flint River as Water Supply

1.0 Quantity of Water Required

Recommended Standards for Water Works, 2003 Edition indicates that the quantity of surface water at the source shall:

- Be adequate to meet the maximum projected water demand of the service area as shown by calculations based on a one in fifty year drought or the extreme drought of record, and should include consideration of multiple year droughts. Requirements for flows downstream of the intake shall comply with requirements of the appropriate reviewing authority.
- Provide reasonable surplus for anticipated growth
- Be adequate to compensate for all losses such as silting, evaporation, seepage, etc.
- Be adequate to provide ample water for other legal users of the source.

2.0 Demand Summary

City staff has indicated the future maximum day demand of the city is 18 mgd.

In addition to the water used by customers, some water will be required for water treatment processes and filter backwash. An allowance for WTP Backwash and Process water of 2 mgd is assumed.

Water used for fire-fighting is not included in customer demand or sales. An allowance 0.7mgd for replenishing water used for fire-fighting is assumed.

The maximum day demand represents the quantity of water which must be supplied on the particular day that the highest use (demand) occurs. Treatment and pumping must be designed to deliver the maximum day demand. During peak periods, storage from the Holloway Reservoir can be utilized to supplement the natural river flow. For analysis of the river as a source, the maximum month will be used as the demand.

A review of the city's water demands and precipitation records suggest that maximum month demand is about 80% of the maximum day demand.

The maximum sustained demand to be withdrawn from the river is computed in the following table:

Table 1: City of Flint Design Demand Summary

Future Maximum Day Demand (Customers)		18.0 mgd
Future Maximum Day Demand (WTP Backwash / Process Water)		2.0 mgd
Subtotal (Future Maximum Day Demand)		20.0 mgd
Sustained (30 day) Future Maximum Day Demand	(80% of MDD)	16.0 mgd
Replenish Water from Fire Fighting		0.7 mgd
Future Maximum Day Demand (Source Water)		16.7 mgd

3.0 Additional Demands and Requirements

In addition to the demands from Section 2, the following demands must be accounted for:

3.1 Mutual Aid

The City and GCDC-WWS have a mutual aid agreement to supply each other water in the event of a disruption in supply or other emergency. The agreement provides that the city will supply GCDC-WWS up to 8 mgd.

For this analysis, it is assumed that an emergency will be corrected within 14 days. The volume of water that may be required is therefore: 14 days * 8,000,000 gal/day = 112,000,000 gal. This volume will be reserved from the reservoir volume.

3.2 Evaporation

Both the Holloway and Mott dams have been constructed since the drought period of the 1930's, which is being used as the base river flow for analysis. Evaporation from the Holloway Reservoir and Mott Lake will reduce the amount of available from the river. The NWS publishes an atlas which shows evaporation rates. Evaporation is primarily a factor during the "growing season"; the atlas shows that about 24" of water is lost via evaporation from open water surfaces in Genesee County over the May through October period. Loss by evaporation will be offset by the addition of rainfall directly upon the water surface. Since the analysis is based upon drought conditions, the low rainfall having a recurrence rate of 100 years will be used. During the May through October period, 11.5 inches of rain is estimated during the 1 in 100 dry year. The net loss by evaporation is therefore 12.5 inches.

The following table summarizes the loss by evaporation, over the six month period from May through October.

Table 2: Reservoir Evaporation Loss

Reservoir	Surface Area (Acres)	Evaporation (inches)	Precipitation (inches)	Net Loss by Evaporation (Gallons)
Holloway Reservoir	1,973	24	11.5	669,646,065
Mott Lake	684	24	11.5	232,153,020
Total				901,799,085

3.3 Siltation

The July 2001 Flint River Assessment completed by the MDNR indicates that sedimentation occurs in the Holloway Reservoir at an accelerated rate, but does not provide quantities. Measurements of the silt accumulation in the reservoir have not been completed. Accumulations of several feet have occurred in other reservoirs. Sedimentation of an average of 1 foot across the Holloway Reservoir will result in the loss of 643,000,000 gallons of storage, or about ten percent of the total volume available.

Mott Lake is not used as a water storage reservoir. Its level is controlled by a fixed weir. Although siltation likely occurs in Mott Lake too, it has no impact on storage for water supply.

3.4 Seepage

Seepage is not believed to have a significant impact on the availability of water at the WTP. Seepage through the embankments of either the Holloway or Mott dams or through the bottom of the reservoirs seems likely to migrate back to the Flint River, although perhaps downstream of the reservoirs, prior to the WTP.

3.5 Flint WWTP

The City's WWTP discharges treated wastewater to the Flint River. The NPDES permit issued to the WWTP has established limits for the treated effluent, based on a drought flow in the river of at least 85 cfs.

3.6 Holloway Reservoir Management Plan

In 1977 the City and Genesee County executed the Holloway Reservoir Management Plan (HRMP) which established parameters for the operation of the dam and reservoir. In 1977, water was no longer withdrawn from the river for water supply and the HRMP appears to have been developed to address four primary issues:

- Availability to utilize the reservoir for water supply as a backup or alternative supply
- Provide for physical maintenance of the dam
- Provide for the recreational use of the reservoir
- Provide flow augmentation to Flint WWTP

The HRMP establishes a summer operating level of 755 and a winter level 751. The summer level maximizes the volume of water available during the dry period in the event that the river is to be used as a water supply. The higher level also supports recreational activities on the reservoir. The 751 winter level provides protection against damage from freezing during the winter. The HRMP establishes a minimum discharge of 65 cfs from the dam, presumably to provide a minimum flow of 85 cfs in the river at the WWTP.

4.0 Analysis

It is assumed that the demands and other requirements identified above are to be maintained in the event that water is withdrawn from the Flint River for water supply. In 1963, USGS published Water Resources Flint Area Michigan, which includes an analysis of the river as a water supply. This publication includes design information regarding the Holloway Reservoir and its operation for water supply.

In 1977 when the HRMP was executed, water was not withdrawn from the river for water supply. If the HRMP required a minimum discharge of 65 cfs at the Holloway Dam to provide for adequate flow in the river at the WWTP, the minimum discharge from the Holloway Dam should be increased by the amount of water withdrawn for water supply if the current river flow at the WWTP is to be maintained.

65 cfs + 16.7 mgd (25.8 cfs) = 90.8 cfs (58.7 mgd)

Figure 1 shows the sustained discharge which can be maintained from the Holloway Reservoir during a drought period. This graph is based on USGS records of flow in the river between 1930 and 1952. This period includes the drought period of 1930 to 1937, which is USGS considers the most severe drought in Michigan history, having a recurrence period of 1 every 50 to 70 years. This period was prior to the construction of Holloway Dam, so river records reflect the natural flow of the river without impact by dam operations.

Figure 1: Draft-Storage Curve, Flint River near Otisville (excerpt from USGS Water Resources Flint Area Michigan)

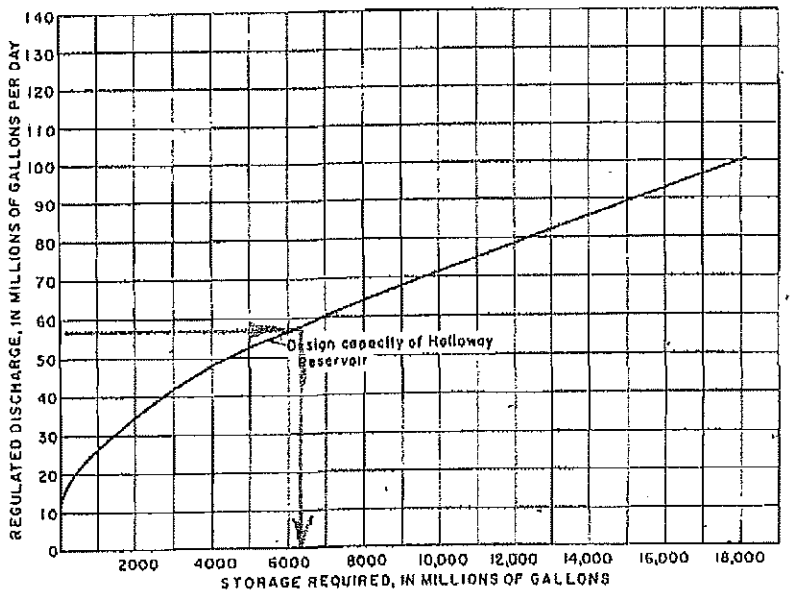


Figure 1 indicates that about 6.2 billion gallons of storage is needed to maintain a sustained discharge of 58.6 mgd from the reservoir to provide the minimum river flow of 85 cfs at the WWTP.

In addition to the 6.2 billion gallons of storage, additional storage is required to provide GCDC-WWS an emergency supply and to make up for reservoir loss by evaporation.

Table 3: Storage Requirements to Maintain Current Conditions plus Water Supply

Storage to meet sustained demand and WWTP flow:	6.20	billion gallons
Storage to provide backup supply to GCDC-WWS:	0.11	billion gallons
Storage to make up loss by evaporation:	0.90	billion gallons
Storage lost by siltation:	0.64	billion gallons (assumed)
Storage to provide loss by seepage:	0.00	billion gallons (assumed)
Storage Needed to Supplement River Flow:	7.85	billion gallons

For this analysis, it is assumed that storage is available from the Holloway Reservoir to supplement the natural river flow.

- The Holloway Reservoir was designed to provide storage for water supply in the 1950's
- The Mott Dam is a fixed weir, so storage is not available. The dam is owned by the Genesee county Parks Department and provides recreational benefit.
- The Hamilton Dam impoundment is limited to the river channel; storage volume is negligible.
- The Utah Dam is inoperable.

- The Kearsley Dam is not directly located on the Flint River, but on the Kearsley Creek just prior to its confluence with the Flint River. The Kearsley Creek discharges to the Flint River downstream of the City's WTP so storage from the river is not available for water supply; however, discharge from the Kearsley dam can be used to supplement downstream river flows, including the flow in the river at the WWTP. The Kearsley Reservoir can provide a maximum of 650 million gallons of storage.
- The Thread Lake Dam is not located on the Flint River, but the Thread Creek discharges into the Swartz Creek which discharges into the Flint River just west of the downtown area. The Thread Lake dam provides a maximum storage volume of 100 million gallons of storage. Discharge from the Thread Lake dam could be used to supplement downstream river flows, but not for water supply.
- For this analysis, storage from neither the Kearsley Reservoir nor Thread Lake is included. Both dams were constructed prior the Holloway Reservoir and discharges from the Kearsley Dam and Thread Lake Dam are assumed to be included in the analysis presented in the USGS publication.

Following is a capacity curve for the Holloway Reservoir, from the USGS Water Resources Flint Area.

Figure 2: Holloway Reservoir Storage Capacity (excerpt from USGS Water Resources Flint Area Michigan)

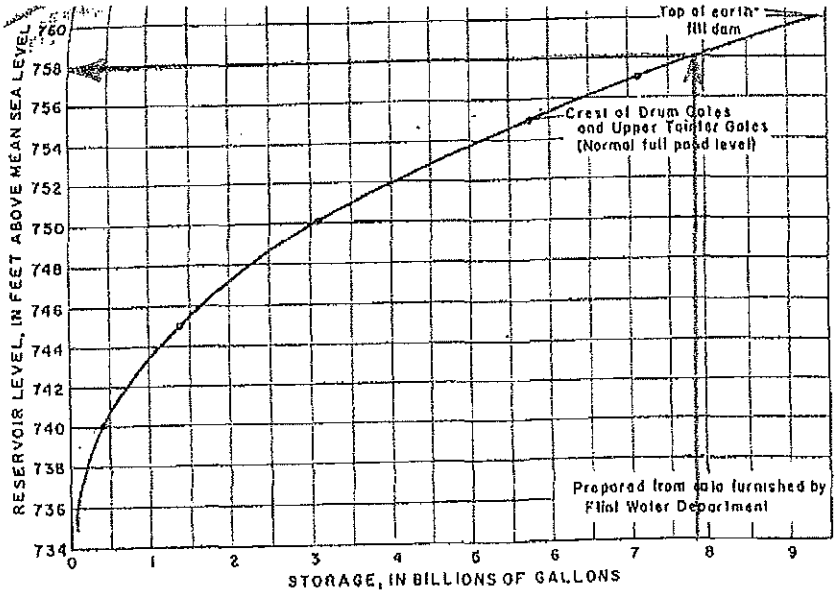


Figure 2 indicates that a Holloway Reservoir level of 758.0 feet provides storage of 7.85 billion gallons.

Review of design drawings of the Holloway Dam indicates that the dam was designed to use drum gates to maintain the normal water level(s) of the reservoir. The drum gates can rotate to allow for reservoir levels ranging from a low level of 751 feet to a high level of 755 feet. If the reservoir is to be maintained

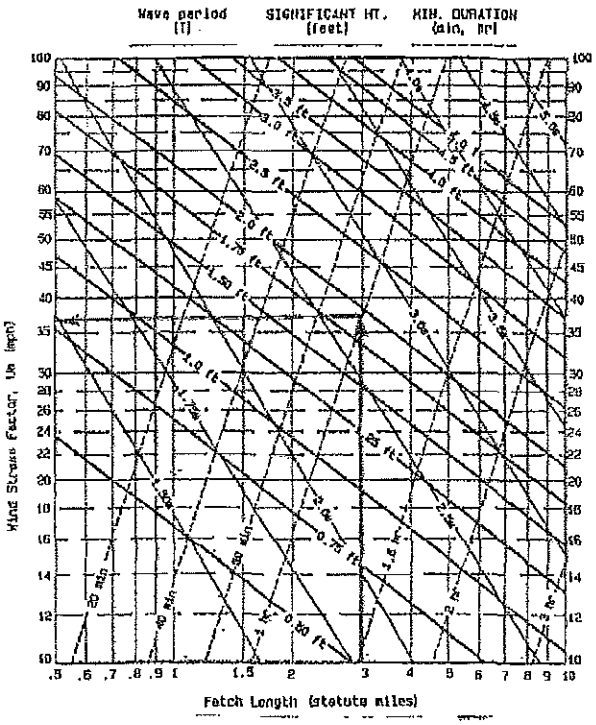
at a higher level than the current summer level of 755 feet, modifications will be required to the drum gates.

According to the original dam design drawings, the dam embankment was constructed to elevation 763 feet (however, the USGS reports shows the top elevation as 760 feet). If the reservoir level is raised to 758 feet, only about five feet of freeboard will be provided to guard against overtopping. There are three concerns regarding increasing the reservoir level from 755 to 758 feet.

The increased hydraulic pressure resulting from the higher water level on one side of the dam will result in increased seepage through the embankment, and a reduction in its integrity.

The reservoir has a fetch of about three miles east from the dam. Figure 3 shows that a 37 mph wind sustained for one hour duration from the east can result in waves capable of two feet. The original design drawings show rip-rap armoring on the reservoir side of the dam embankment to an elevation of 757 feet. Rip-rap armoring should be extended to at least two feet higher than the 758 feet level to protect against wave action.

Figure 3: Predicted Wave Action – Holloway Reservoir



The reservoir is tributary to a large watershed. There have been rapid increases in river flow (and reservoir level) soon after intense rain events in the watershed. A rain storm in June 1996 resulted in a 1.62 foot increase in the water level of the reservoir resulting in the opening of dam gates and discharge of 7,740 cfs. Reducing the freeboard also reduces the volume available for flood management.

5.0 Quantity of Water Supply Available

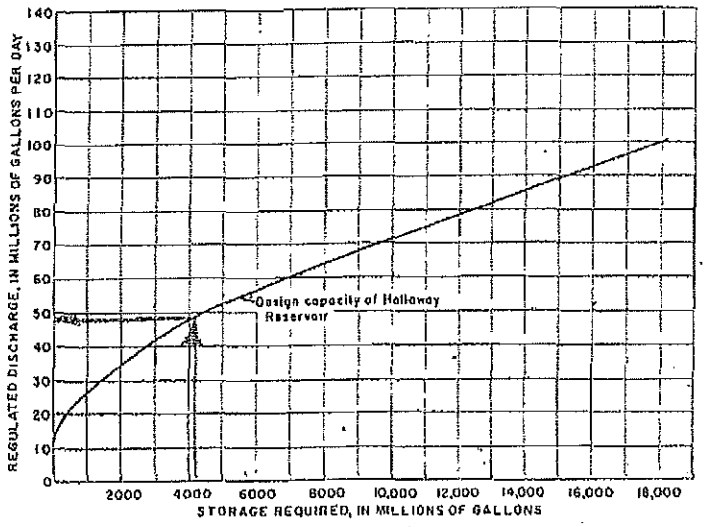
Analysis has shown that without modifications to facilities and/or permits and agreements, the river cannot supply the future maximum demand of the city.

Table 4: Storage Available for Water Supply

Original Storage Volume of Holloway Reservoir (elevation 755')	5.76	billion gallons
Storage lost by Sedimentation (assumed)	0.64	billion gallons
Storage to make up for Evaporation	0.9	billion gallons
Storage to provide backup supply for GCDC-WWS	0.11	billion gallons
Storage available to supplement river flow	4.11	billion gallons

The following figure shows that 4.11 billion gallons of storage can sustain a supplemental flow of 48 mgd.

Figure 4 – Sustained Discharge Available from Holloway Reservoir



A minimum discharge of 48 cfs from the Holloway Reservoir can support a sustained water withdrawal of about 11 mgd and maintain 85 cfs at the WWTP, as shown in the following table.

Table 5 – Maximum Sustained WTP Withdrawal Available

	1978 - Holloway Reservoir Management Plan	Future
Minimum Reservoir Discharge	65 cfs	48 cfs
River Inflow	20 cfs	20 cfs
WTP Withdrawal	0 cfs	17 cfs (10.99 Mgd)
River Flow at WWTP	85 cfs	85 cfs

A sustained water withdrawal of 11 mgd will support a maximum day demand of 11.6 mgd, as shown in the following table.

Table 6 – Available WTP Maximum Day Demand

Sustained Withdrawal Available		11.0 mgd
Water to replenish fire fighting		0.7 mgd
Sustained (30 day) Future Maximum Day Demand Available		10.3 mgd
Future Maximum Day Demand Available	(Multiply by 125%)	12.9 mgd
Water available for WTP Backwash/Process		1.3 mgd
Water available for customer Max Day Demand		11.6 mgd

Appendix 4 - Holloway Dam Drawings

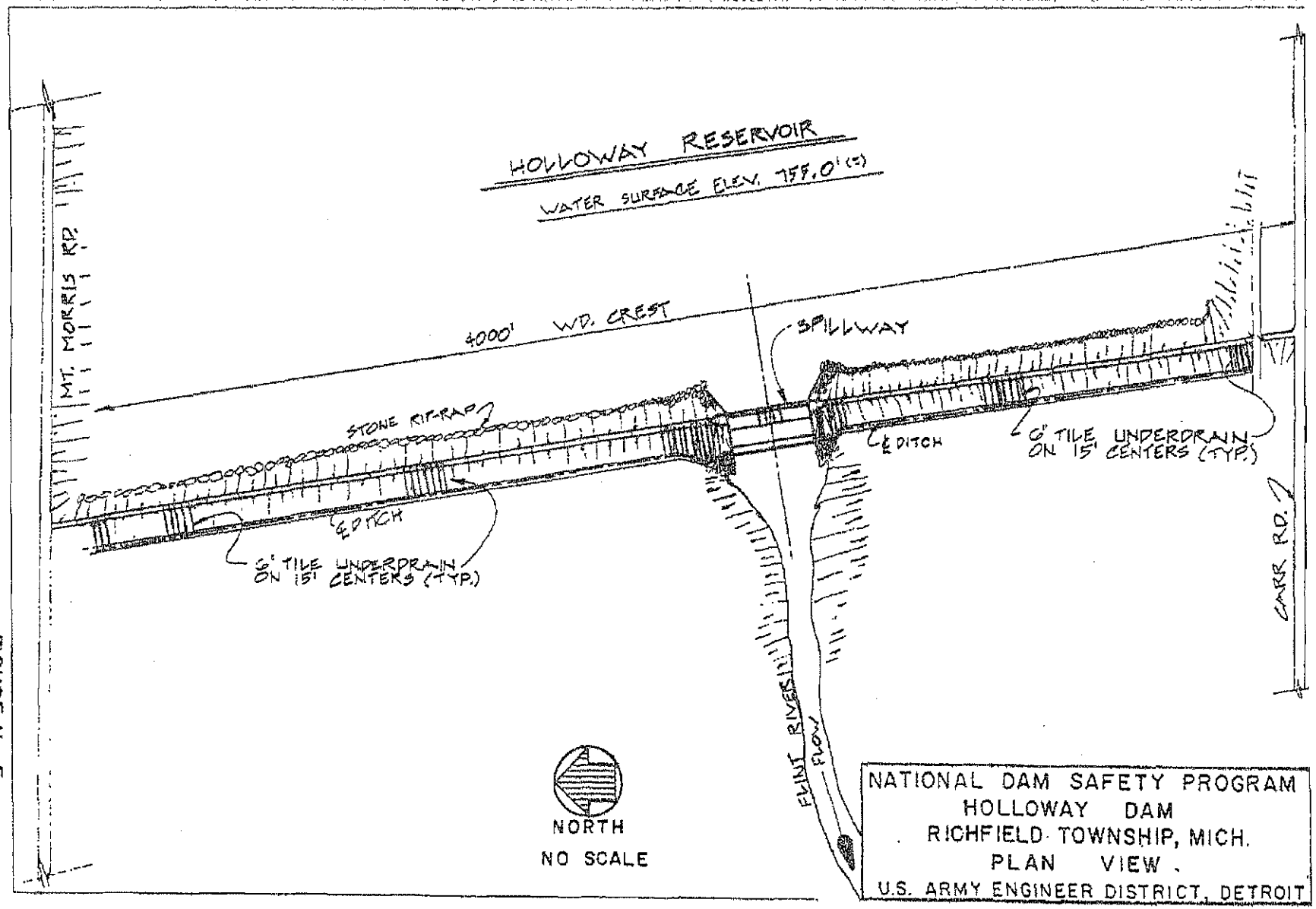


FIGURE No. 5

002667

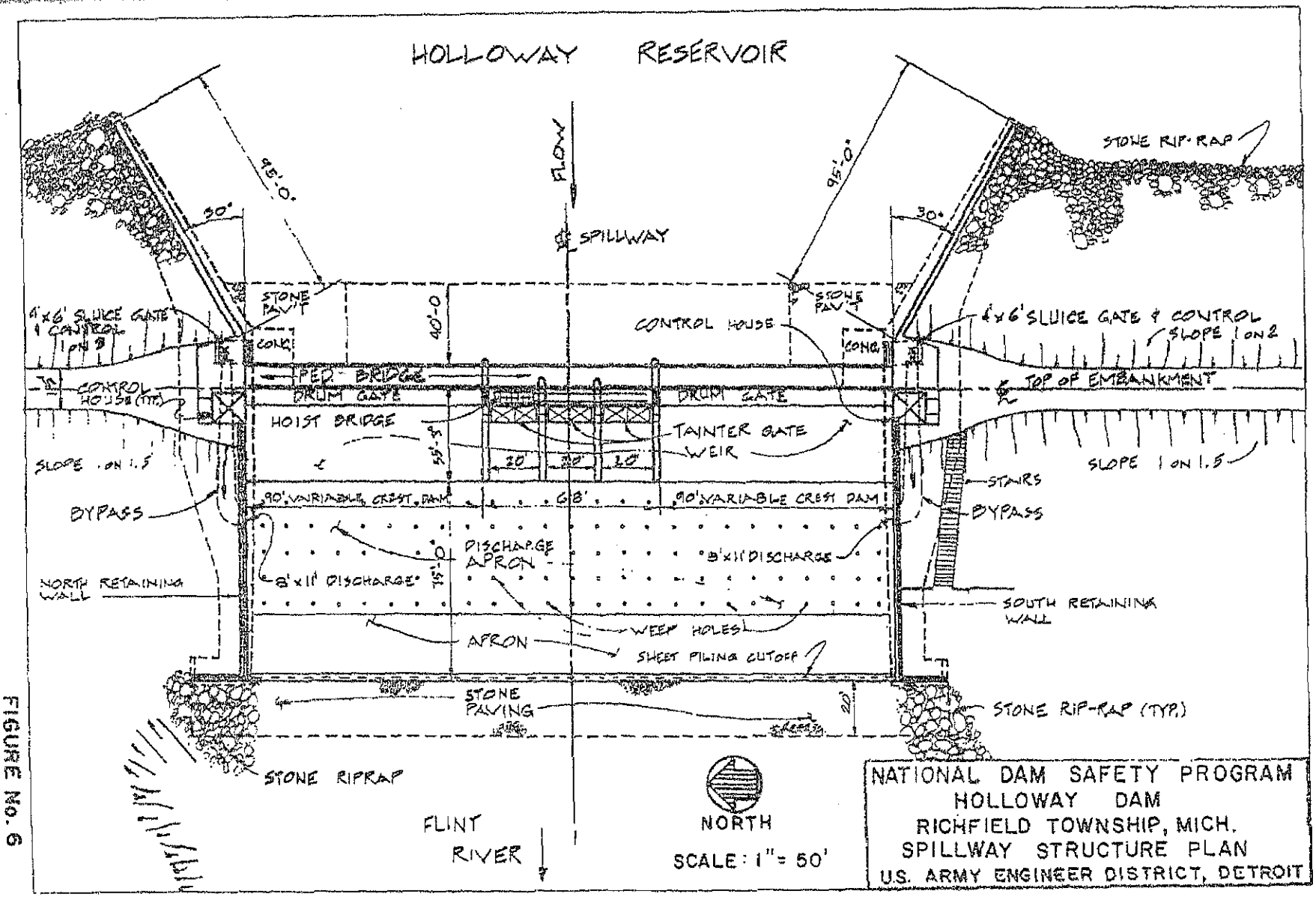

HOLLOWAY RESERVOIR
FLOW
SPILLWAY
95'-0"
30°
STONE RIP-RAP
STONE PAVT
40'-0
CONC
CONTROL HOUSE
4'x6' SLUICE GATE & CONTROL
SLOPE 1 ON 2
TOP OF EMBANKMENT
FED BRIDGE
DRUM GATE
HOIST BRIDGE
TAINTER GATE
WEIR
SLOPE 1 ON 1.5
STAIRS
BYPASS
90' VARIABLE CREST DAM
68'
DISCHARGE APRON
8'x11' DISCHARGE
NORTH RETAINING WALL
SOUTH RETAINING WALL
WEEP HOLES
APRON
SHEET PILING CUTOFF
STONE PAVING
20'
STONE RIP-RAP (TYP.)
STONE RIPRAP
FLINT RIVER
NORTH
SCALE: 1" = 50'
NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
SPILLWAY STRUCTURE PLAN
U.S. ARMY ENGINEER DISTRICT, DETROIT

FIGURE No. 6

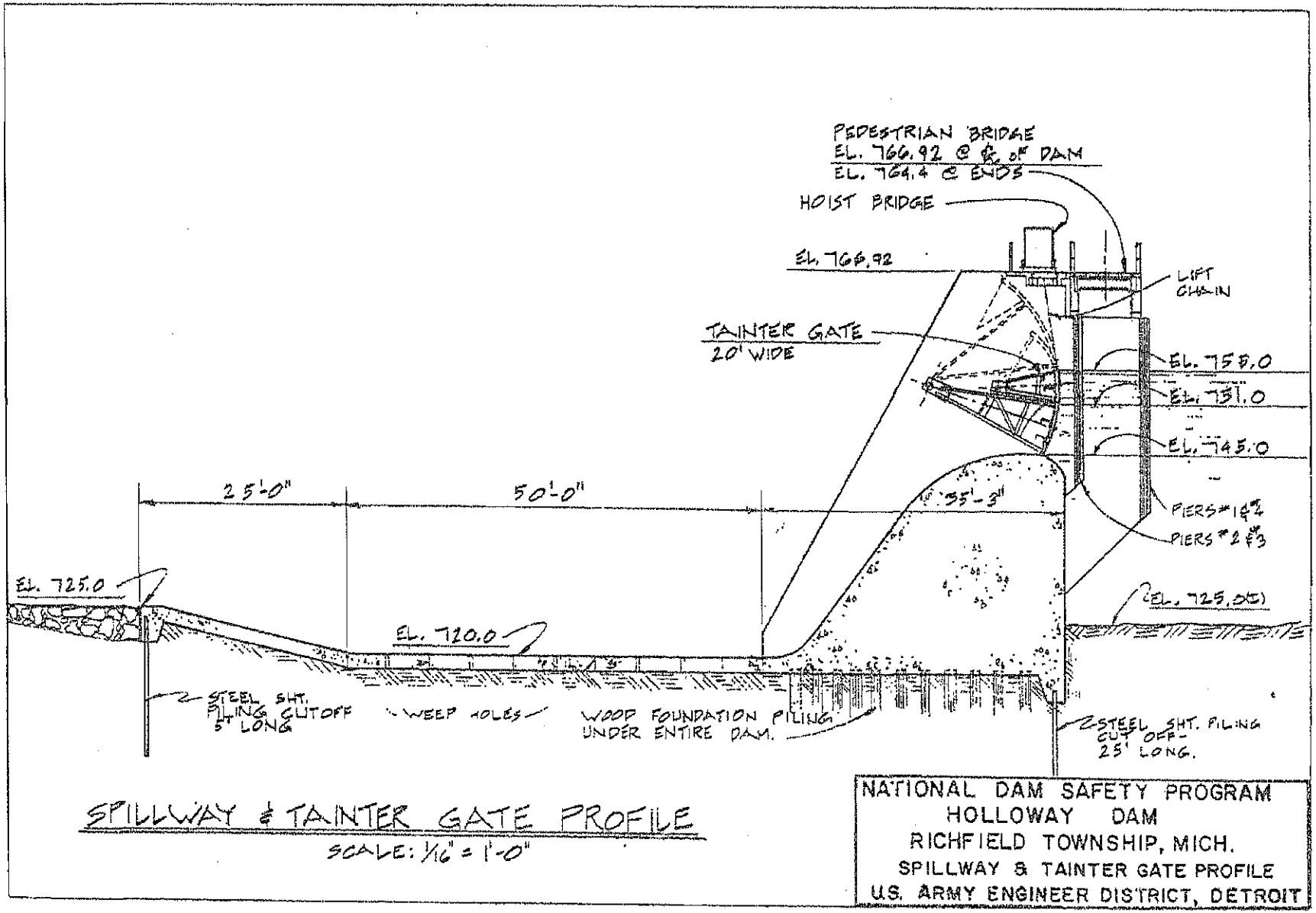
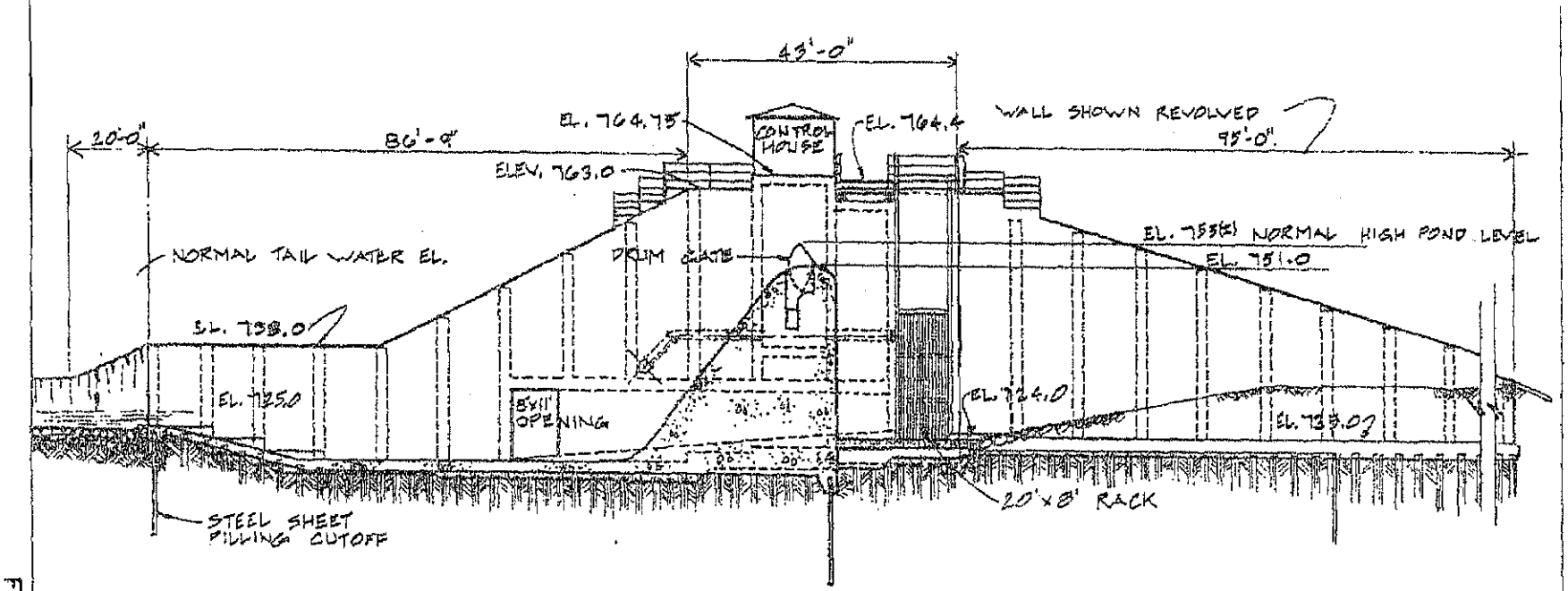


FIGURE No. 7

SPILLWAY & TAINTER GATE PROFILE

SCALE: 1/16" = 1'-0"

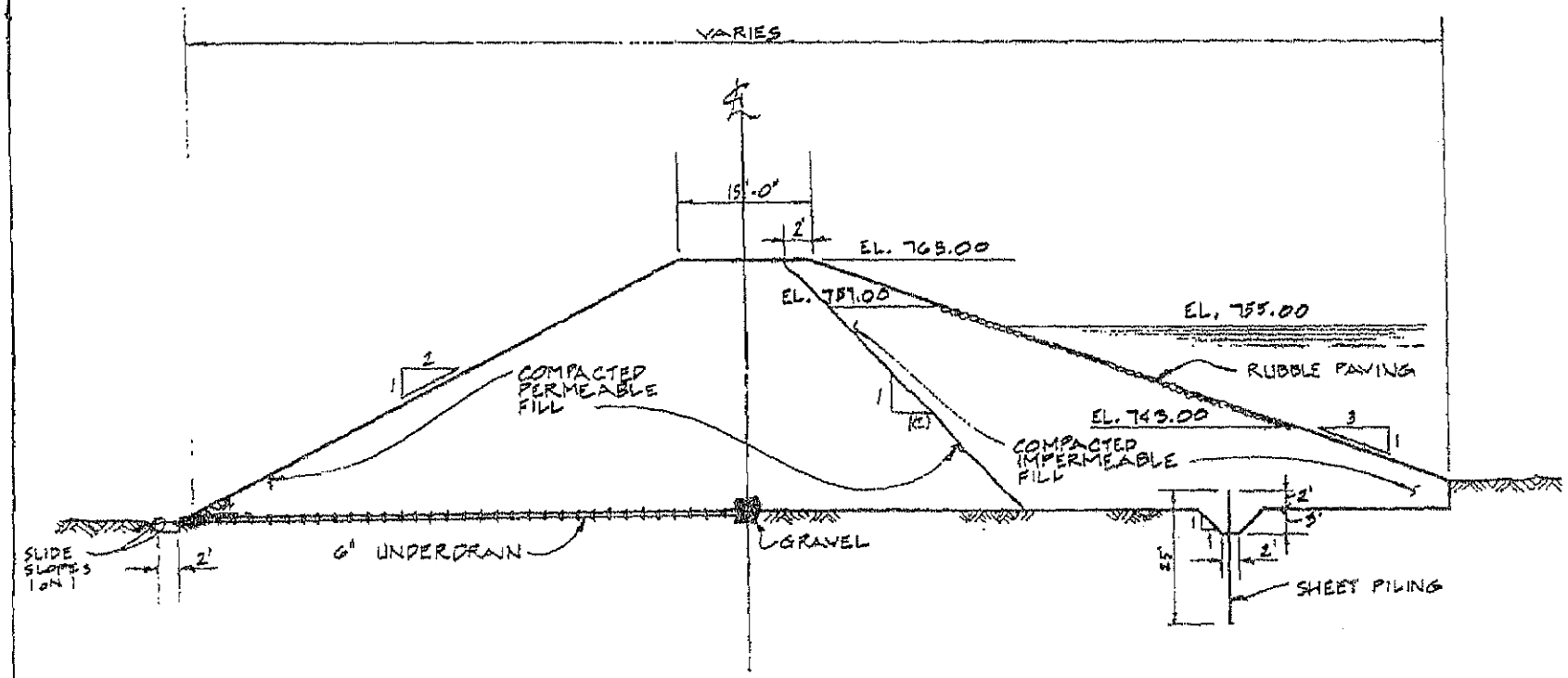
NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
SPILLWAY & TAINTER GATE PROFILE
U.S. ARMY ENGINEER DISTRICT, DETROIT



SPILLWAY AND DRUM GATE PROFILE
NO SCALE

FIGURE No. 8

NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
SPILLWAY & DRUM GATE PROFILE
U.S. ARMY ENGINEER DISTRICT, DETROIT

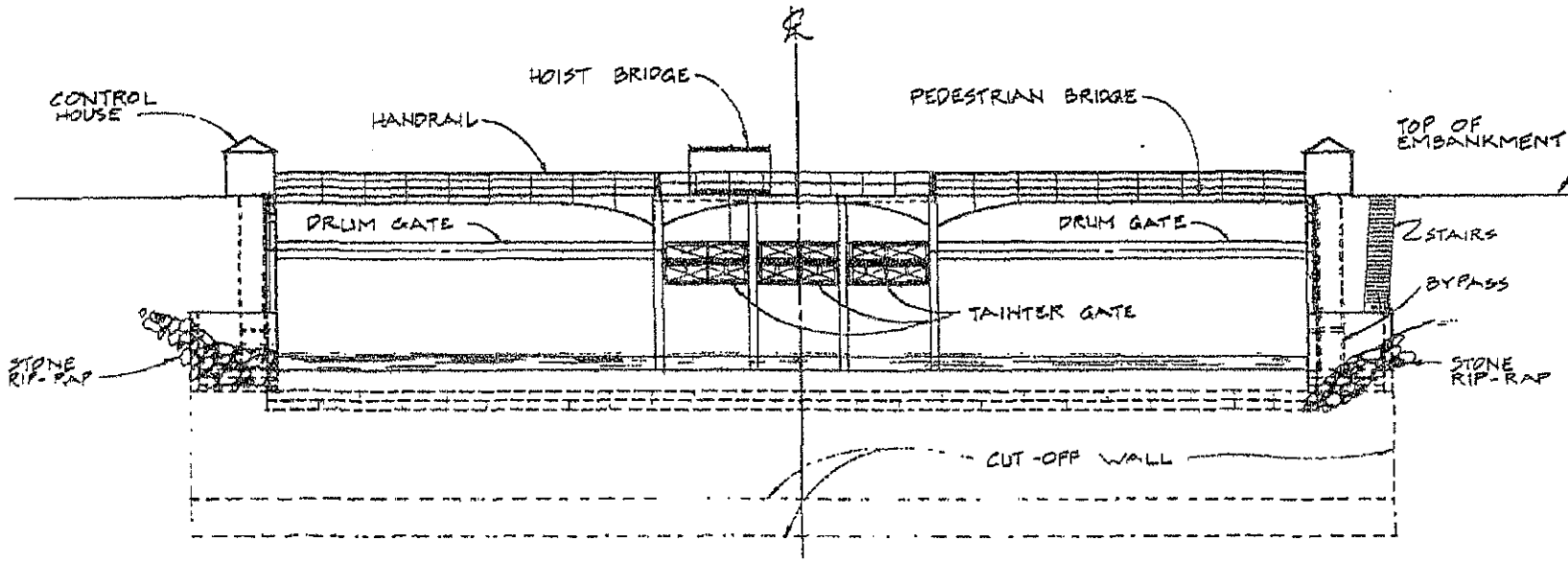


TYPICAL DAM SECTION

NO SCALE

FIGURE No. 9

NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
EARTH EMBANKMENT PROFILE
U.S. ARMY ENGINEER DISTRICT, DETROIT

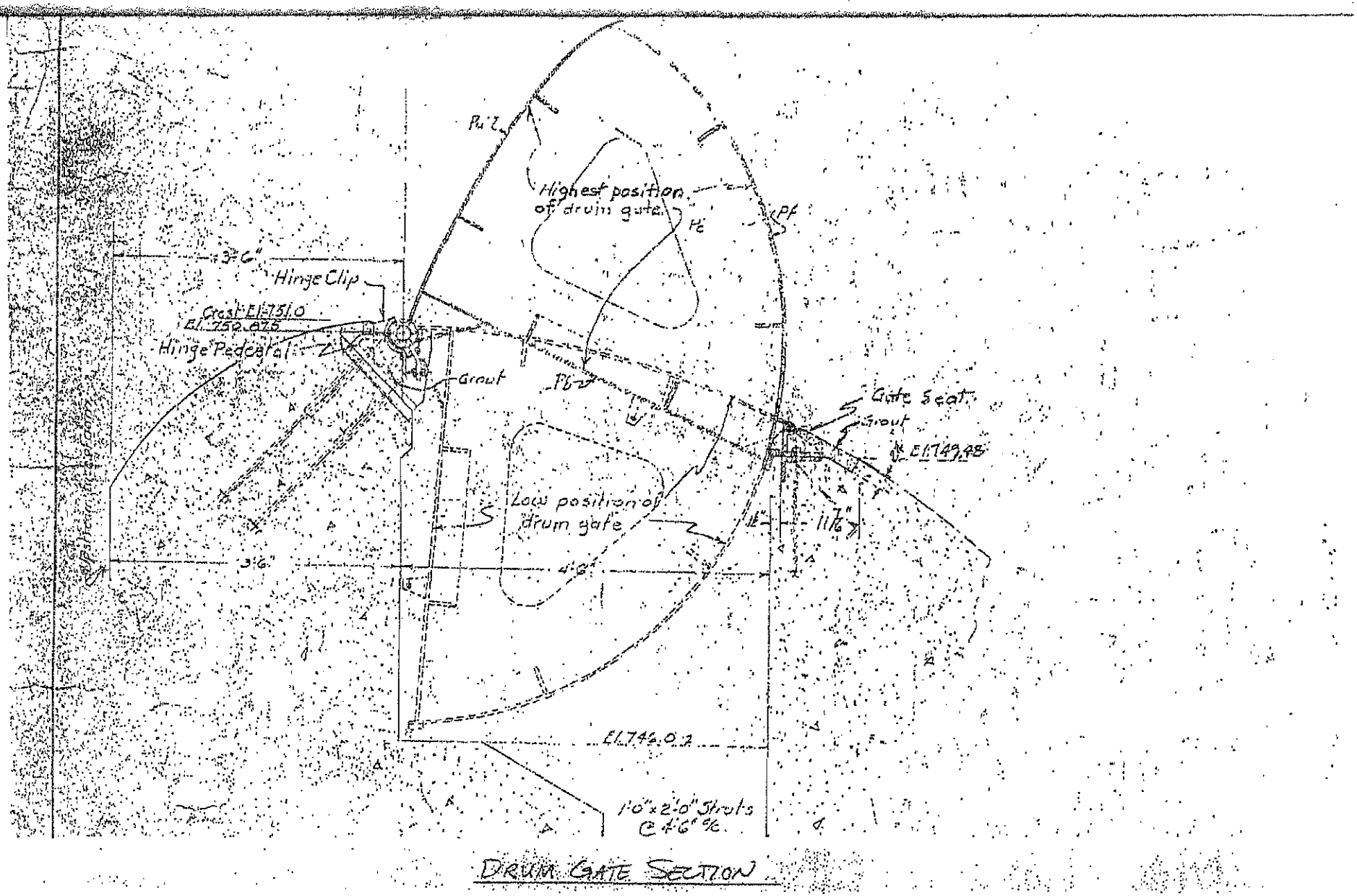


SPILLWAY ELEVATION VIEW

SCALE: 1" = 40'

FIGURE No. 10

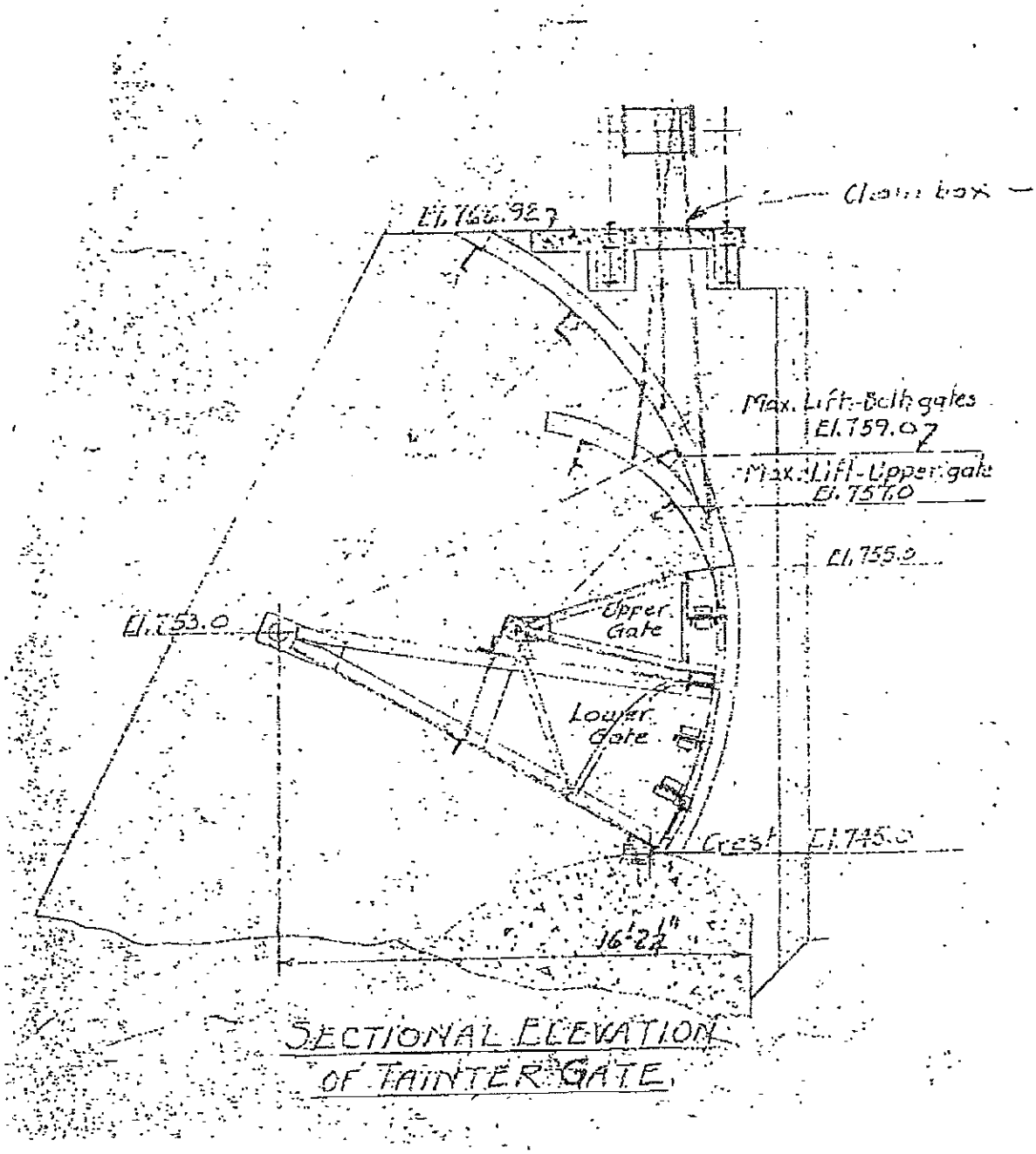
NATIONAL DAM SAFETY PROGRAM
HOLLOWAY DAM
RICHFIELD TOWNSHIP, MICH.
SPILLWAY ELEVATION VIEW
U.S. ARMY ENGINEER DISTRICT, DETROIT



DRUM GATE SECTION

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002674



SECTIONAL ELEVATION OF TAINTER GATE.

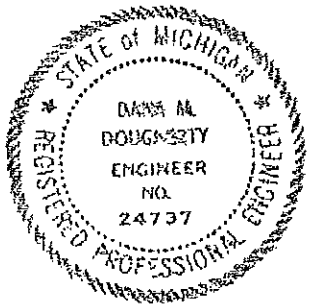
Appendix 5 - 2008 Holloway Dam Safety Report

MICHIGAN PUBLIC ACT 451, PART 315
INSPECTION REPORT
HOLLOWAY DAM
GENESEE COUNTY, MICHIGAN
INVENTORY NUMBER 064 – HIGH HAZARD

FOR

CITY OF FLINT
WATER TREATMENT PLANT
4500 N. DORT HIGHWAY
FLINT, MICHIGAN 48505
ATTN: MR BRENT WRIGHT
(810) 787-6537

BY
Stantec Consulting Michigan Inc.
Engineers – Planners – Surveyors
3959 Research Park Drive
Ann Arbor, Michigan 48108-2219
(734) 761-1010



INSPECTOR(S):	Dana M. Dougherty – Stantec Consulting Michigan Inc.
DATE OF INSPECTION:	October 19, 2008
PROFESSIONAL ENGINEER:	Dana M. Dougherty, PE STANTEC CONSULTING MICHIGAN INC. 3959 RESEARCH PARK DRIVE ANN ARBOR, MICHIGAN 48108-2219

Dana M. Dougherty, PE #24737

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

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HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

1.0 Purpose and Authority

The purpose of the report is to present a summary of findings for the field inspection of the Holloway Dam completed by Stantec Consulting Michigan Inc. (Stantec) on October 19, 2008 pursuant to the requirements of Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451, Section 31518.

This dam inspection Report and associated inspection activities were commissioned by the City of Flint, Michigan, the dam owner. The Holloway Dam is registered with the Michigan Department of Environmental Quality (MDEQ) as Dam Number 064.

References in the report to "left" and "right" are based on the observer facing downstream.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

2.0 Conclusions and Recommendations

The Holloway Dam was inspected on October 19, 2008 in accordance with Michigan P.A. 451, Part 315 criteria. The dam, including spillway and embankments was found to be in good condition. A summary of comments/recommendations is as follows:

1. The City of Flint should continue their operation and maintenance procedures as outlined in the "Holloway Reservoir Operation and Maintenance Plan".

2. The Emergency Action Plan should be exercised annually and Notification List concurrently updated.

3. Small brush should be removed from the left and right embankments.

4. Minor spalls and cracks in the spillway concrete should be monitored. These do not require immediate correction, but should be planned and budgeted in the City's long term Capital Improvement Plan (CIP).

5. The seepage monitoring weirs should be placed back into operation by repairing the eroded channel. Periodic observations of seepage rates and observed fines deposition should be performed and logged for long term data comparison.

6. Warning signs on the concrete abutments should be re-painted.

7. The security fence in the downstream right embankment should be repaired.

8. Monitor the sloughed area in the downstream right embankment and repair as needed.

9. Further inspections should be performed in accordance with P.A. 451, Part 315 regulations.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

3.0 Project Information

The Holloway Dam is located on the Flint River in Richfield Township, Genesee County, Michigan (Section 11, T8N, R5E). The dam and lower one fourth of the reservoir are in Genesee County while the upper three fourths of the reservoir are in Lapeer County. The dam was built in 1954 to maintain a base flow in the Flint River for water supply and sewage dilution requirements. The Holloway Dam was previously referred to as the Richfield Storage Dam. Presently the reservoir's uses are primarily, base water flow implementation, sewage dilution and recreation. The dam consists of earth embankments and a 248 ft long gated concrete spillway structure. The total length of the dam is approximately 3,350 ft between the natural moraine banks. The top of the embankment serves as a gravel road for maintenance purposes. A steel framed walkway spans the top of the spillway structure for operation and maintenance of the gates. The embankment side slopes are 3 horizontal to 1 vertical on the upstream face and 2 horizontal to 1 vertical on the downstream face.

3.1 PERTINENT DATA

The embankment is comprised of two zones: an upstream section and key trench of compacted impervious clay; and a larger downstream section of essentially granular material, predominantly sand with some gravel.

The plans show a sheet pile cutoff wall along the full length of the dam near the upstream toe, extending 23 ft below the base of the embankment and two feet into the embankment. A subdrain system, originating just downstream of the centerline of the crest and transverse to the dam axis, is also shown. The plans indicate that this subdrain system is formed by tile drain pipes with a center-to-center drain spacing of 15 ft. Plan details indicate a graded filter surrounding the tile drain pipes. The pipes empty into a collection ditch at the toe of the downstream slope. The right embankment has been modified by installation of fill at the toe with a bench located mid point on the slope. Weep drains were extended with 6" PVC pipe.

The outlet works of the dam consist of a reinforced concrete spillway controlled by seven gates. There is a control house on each end of the spillway. A telemark water level recording gage is in the left control house.

The following is a tabulation of principal data obtained from the construction drawings.

Hazard Classification – High (per 1978 USACE report).

Length of Dam – Overall length of the dam including the concrete spillway structure and the right and left embankments is approximately 3,350 ft.

Height of Dam – The total height of the dam, defined in P.A. 451, Part 315 as the difference in elevation between the natural stream bed and the design flood elevation, is approximately 30 ft. the crest of the dam is at El. 763.0 ft.

Crest Width of Embankments – Approximately 15 ft.

Side Slopes – The earth embankments have 3.0 H to 1.0 V slopes on the upstream face and 2.0 H to 1.0 V slopes on the downstream face. The right embankment downstream slope has been modified with fill at the toe and a bench at midpoint.

Spillway: 248 ft long concrete spillway structure with:

a) two 90 ft long drum gates

b) three 20 ft long taintor gates

c) two 4 ft by 6 ft sluice gates perpendicular to the dam axis

d) 75 ft by 248 ft wide discharge apron

Cutoff: 25 ft deep steel sheet pile cutoff wall at the upstream toe of the full length of the dam, and 15 ft deep steel sheet pile cutoff wall along the downstream side of the spillway structure.

Embankments: Upstream section and key trench of compacted impervious clay and a larger downstream section of granular material, predominantly sand with some gravel.

Further details of the spillway structure and embankments are shown in **Appendix A.** These figures have been taken from the 1978 Phase I Inspection Report.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

4.0 Field Inspection

An inspection of the facilities was performed by Dana M. Dougherty, PE (Stantec) on October 19, 2008. The weather on the date of inspection was clear with temperature at approximately 55°F. The impoundment elevation was near normal (summer) i.e. 755. Flow was passing over the drum gates as well as through the left (looking downstream) sluicegate.

The following items were noted: (Referenced photographs can be found in **Appendix C.**)

4.1 SPILLWAY

Overall the spillway appeared to be in excellent condition. Recent preventative maintenance work includes painting of miscellaneous metals including handrails, gates, and support beams, installation of new galvanized steel grating on the gate operator platform and patching concrete at the upper downstream end of the taintor gate piers.

Some minor items were noted with regard to concrete condition including:

1. There was spalled concrete on the top of the upstream right wingwall. The face of the wall exhibited cracking and efflorescence at this location (Ref. Photos #3 and #4).

2. There was a small crack in the right abutment immediately above the drum gate. There is no evidence of movement or displacement at this crack (Ref. Photo #6). This should be monitored.

3. Minor alligator cracking was noted in the taintor gate piers (Ref. Photos #7 and #8). These do not pose any immediate concern but should be monitored.

4. There were cracks in the left abutment and left downstream retaining walls. No displacement was noted. These cracks should be monitored for future movement (Ref. Photos #9 and #10).

5. The upper portion of the downstream end of the left downstream retaining wall has alligator cracking and effervescence. This should be monitored (Ref. Photo #12).

6. The warning signs that are painted on the upstream abutment/wingwall faces are faded and difficult to read. These should be repainted.

4.2 RIGHT EMBANKMENT

Overall the condition of the right embankment appears to be good with no significant erosion, seepage, settlement, sloughing or animal burrows noted. The following specific items were noted:

1. There was a minor amount of erosion beneath the riprap on the upstream embankment face immediately adjacent to the spillway.

2. Some brush has begun to grow on the upstream slope. This should be selectively removed (Ref Photos #14 and #16). Small natural growth such as wildflowers and grasses should remain.

3. Considerable brush was observed on the downstream embankment face and within the toe-of-slope drain. This should be removed (Ref. Photos #17 and #20).

4. For the most part weep tiles are dry. There is one section midway in the embankment where the weep tiles are active. Some sloughing of the slope was observed in this area. It appeared that this has been addressed through addition of a blanket drain with geotextile fabric. This should be monitored for further displacement.

5. A short section of the security fence was in disrepair. This should be corrected (Ref. Photo #23).

6. The seepage monitoring weir is not functioning. Flow was passing around the weir through an eroded section. This should be corrected (Ref. Photo #24).

4.3 LEFT EMBANKMENT

The observed condition of the left embankment was good to excellent. There was no evidence of significant erosion, seepage, settlement, sloughing or animal burrows. The following specific items were noted:

1. A minor amount of small brush should be removed from the downstream slope (Ref. Photo #28).

2. There was no evidence of seepage from the weep drains, however the toe-of-slope drain was flowing, in particular the final 100 ft (Ref. Photo #29).

3. The seepage monitoring weir is not functioning similar to the right side. Flow was passing around the weir through an eroded section. This should be corrected (Ref. Photo #30).

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

5.0 Structural Stability

The assessment of stability is based on visual observations made during our field inspection (10/19/08).

No deficiencies were noted that would impact the structural integrity of the dam; however minor items were noted that should be proactively addressed to mitigate potential future deficiencies. Over all the condition of the facility remains good.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

6.0 Hydrology and Hydraulics

The MDEQ has estimated the required spillway capacity at the Holloway Dam to be 9900 cfs (reference **Appendix B**). This equates to the 200 year frequency flood which is mandated by statute – P.A. 451, Part 315, Section 324.31516.

Headwater rating curves previously produced by the USACE (1978) and Acres International (1993) indicate that this discharge capacity can be met at an impoundment elevation of approximately 755. This would allow for approximately 8 feet of freeboard. Thus, the spillway discharge capacity is sufficient to meet P.A. 451, Part 315 requirements. Furthermore, the spillway capacity at overtopping (El. 763) is approximately 40,000 cfs or ½ PMF.

The spillway capacity has also been determined with the assumption that the drum gates fail to operate and are locked in the up position (reference Ayres, Lewis, Norris & May, Inc. (ALNM) Report – 1996). The resultant 200 year impoundment elevation is computed to be approximately 761 or two feet of freeboard. Therefore, the required spillway design capacity can be met through operation of the taintor gates only.

HOLLOWAY DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

7.0 Operation and Maintenance

The dam is operated and maintained by staff from the City of Flint Water Treatment Plant. Routine operation and maintenance is performed in accordance with the Holloway Reservoir Operation and Maintenance Plan which is on file at the City of Flint WTP.

Impoundment elevation is continuously monitored via an on-site level transducer. Instantaneous level information is available remotely to assist operations personnel in maintenance of the impoundment elevation.

During summer months, the drum gates are in a raised position and taintor gates closed. The impoundment elevation is maintained between 755.0 and 755.75 by operating the drum and/or taintor gates as needed.

The impoundment elevation is lowered in the winter to approximately elevation 751.0. The drum gates are lowered during this period.

Emergency backup power is available to operate the taintor gates in case of a power loss. An *Auxiliary Generator Power System Report is available at the WTP.*

The City has performed routine maintenance of the facilities on an "as needed" basis. The most recent work consisted of painting exposed steel components including the taintor gates and access platform support steel.

In addition to routine surveillance by operations staff, supervisor staff also performs an annual inspection of the facilities. Noted deficiencies are scheduled for correction the following year.

Appendix 6 - 2008 Utah Dam Safety Report

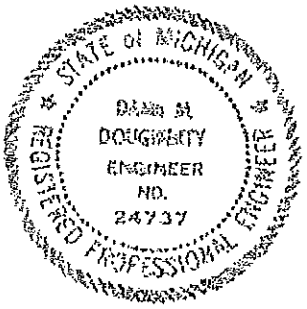
MICHIGAN PUBLIC ACT 451, PART 315
INSPECTION REPORT
UTAH DAM
GENESEE COUNTY, MICHIGAN
INVENTORY NUMBER 1275 – LOW HAZARD

FOR

CITY OF FLINT
WATER TREATMENT PLANT
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FLINT, MICHIGAN 48505
ATTN: MR BRENT WRIGHT
(810) 787-6537

BY

Stantec Consulting Michigan Inc.
Engineers – Planners – Surveyors
3959 Research Park Drive
Ann Arbor, Michigan 48108-2219
(734) 761-1010



INSPECTOR(S): Dana M. Dougherty – Stantec Consulting Michigan Inc.

DATE OF INSPECTION: October 19, 2008

PROFESSIONAL ENGINEER: Dana M. Dougherty, PE
STANTEC CONSULTING MICHIGAN INC.
3959 RESEARCH PARK DRIVE
ANN ARBOR, MICHIGAN 48108-2219

Dana M. Dougherty, PE #24737

Stantec
INSPECTION REPORT
UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

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2. FEMA Flood Insurance Map
3. 1993 Acres Report (Excerpts)

APPENDIX C – PHOTOGRAPHS

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

1.0 Purpose and Authority

The purpose of the report is to present a summary of findings for the field inspection of the Utah Dam completed by Stantec Consulting Michigan Inc. (Stantec) on October 19, 2008 pursuant to the requirements of Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451, Section 31518.

This dam inspection Report and associated inspection activities were commissioned by the City of Flint, Michigan, the dam owner. The Utah Dam is registered with the Michigan Department of Environmental Quality (MDEQ) as Dam Number 11275.

References in the report to "left" and "right" are based on the observer facing downstream.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

2.0 Conclusions and Recommendations

The Utah Dam was inspected on October 19, 2008 in accordance with Michigan P.A. 451, Part 315 criteria. The dam was found to be in fair to poor condition. A summary of comments/recommendations is as follows:

1. The stability of the exposed portion of the structure is poor and is no longer capable of serving its intended purpose.

2. The operating components of the facility (floodgates) have been decommissioned for sometime and are no longer functional.

3. The purpose of the dam (impound water for the upstream water treatment plant) is no longer needed as the Hamilton Dam, which is located downstream, provides this capability.

4. The Hamilton Dam is currently being evaluated for potential reconstruction and should the decision be made to proceed with that project the Utah Dam will serve no useful future function.

5. The spillway hydraulic capacity is deficient with regard to P.A. 451, Part 315, Section 324.31516 rules. This is further exacerbated by the fact that the partially open gates impede high flows resulting in an increased backwater.

6. The City should consider full or partial removal of the dam. It is possible that the foundation and submerged portion of the piers may be reused to support a new pedestrian crossing bridge. The minimum removal effort would consist of removing the gates from the dam. Due to the aforementioned deficiencies and related public safety liabilities the City should take immediate action perhaps concurrent with the proposed Hamilton Dam reconstruction.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

3.0 Project Information

Utah Dam is located on the Flint River in the City of Flint, Genesee County, Michigan (T08N, R07E, Section 32) at the south end of Whaley Park. The site location map is shown in **Appendix A.**

Utah Dam is owned by the City of Flint and plans for the dam are on file with the City. It was designed by the Ambursen Dam Company of New York and San Francisco and built around 1928. The dam was constructed to maintain a reservoir at El. 711 to provide sufficient head on the City's water treatment plant intake pipe. The pool created by the dam was limited to the main channel of the Flint River. The dam was built between the two banks of the river and has a total length of 240 ft. It consists of a concrete gravity structure with six spillway bays and 4 ft wide piers. Each bay has a 12 ft high by 25 ft long vertical lift gate.

There are two bridge decks on the structure. The upper deck is approximately 11 ft wide and it is used to move the gate hoist along the length of the dam. The gate hoist travels the length of the dam on two No. 40 rails, each of which is supported by 15 inch "I' beams. The beams are supported by the piers.

The lower bridge deck is separated by the vertical lift gates. The downstream side of the deck is 7 ft wide and it serves as a pedestrian walkway. The upstream side of the deck is 5 ft wide and it is used by the operator to gain access to the upper deck via a steel ladder.

Presently, the dam serves as a walkway over the Flint River and as a backup for Hamilton dam for providing a head on the water intake pipe. The gates of Utah Dam are currently locked open above the normal backwater elevation created by Hamilton Dam, which is 2.2 miles downstream. Elevations given in this report are referenced to National Geodetic Vertical Datum.

Six spillway bays and vertical lift gates are contained within the structure. Pertinent data about Utah Dam is give below.

Height of Dam – The total height of the dam, defined in P.A. 451, Part 315 as the difference in elevation between the natural stream bed (El. 696.8 ft) and the design flood elevation (El. 717.2 ft) is approximately 20.4 ft.

Crest Width of Structure – 30 ft as measured along the lower deck.

Sill of Vertical Lift Gates – El. 697.3 ft.

Sketches of the dam are included in **Appendix A.**

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

4.0 Field Inspection

An inspection of the facilities was performed by Dana M. Dougherty, P.E. (Stantec) on October 19, 2008. The weather on the date of inspection was clear with temperature at approximately 55°F. The impoundment elevation was approximately 1.9 ft below normal elevation. The City was in the process of lowering the Hamilton Dam impoundment per directive from the MDEQ. This directive requires that the Hamilton Dam impoundment be lowered 3.25 ft.

The following items were noted (Reference photographs can be found in **Appendix C**):

1. The concrete condition on the downstream face of the dam is fair to poor. The right downstream retaining wall shows significant spalling in its top and outside corner. The left downstream retaining wall has significant spalling and cracking. The pier noses (three of five) are spalled. The access platform or walkway or the dam, concrete is in fair to poor condition. There is effervescence and cracking in the access platform support beams. There is no displacement. (Ref. Photos #1 and #5.)

2. The concrete condition of the upstream dam face is fair to poor. The noses of all piers show effervescence and some alligator cracking. This is also true for the right and left upstream retaining walls. There does not appear to be any substantial structural cracking in any of these members or displacement. There is spalling of concrete at the top of the piers as well as at the top of the abutment walls where the access platform rests. There is also some indication of spalling in the access platform beams and in some cases at the bottom of the beams themselves (Ref. Photos #2 and #6).

3. The gates are randomly open. The left gate, Bay No. 1, is 2 feet above the water level on this date. Bay No. 2 and No. 3 from the left, are 4 feet above water level on this date and Bay No. 4, 5, and 6 are 6.5 feet above water level. All dimensions reference water level to the bottom of the gate.

4. The superstructure appears to be in very poor condition. Concrete is in fair to poor condition. The operating platform, which housed a single moveable gantry crane for all six gates, has spalling in the beams as well as the piers. Protective railings are all intact, but in poor condition and require painting (Ref. Photos #7 and #8).

5. The top of the right embankment has a paved walkway with chain link fence on either side of the walkway. This is also true for the left embankment. There is also lighting at the site, utility poles in each embankment with a light fixture (Ref. Photos #3 and #4).

6. The embankments have some tree growth which should be removed.

7. On the date of the inspection, the water level is about 10.6 feet below the operating/walkway platform (El. 706.6 NGVD).

8. There is a 4 foot wide opening in the fence on the left downstream face of the dam, next to the utility pole, which allows access and is a safety issue. Also, the safety fencing that was installed on the upstream side of the dam, between the walkway and the gates, has been removed and is a safety issue.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

5.0 Structural Stability

The assessment of stability is based on visual observations made during our field inspection (10/10/08).

The overall structural condition of the Utah Dam is categorized to be fair to poor. Substantial deteriorated concrete is evident with numerous spalls, cracks, and some exposed reinforcing steel. The superstructure concrete is in the poorest condition with the gate lift support structure no longer capable of supporting its intended function i.e. gate operation.

The condition of the access platforms and exposed portions of the piers is somewhat better than the superstructure but still would be categorized as poor. The submerged portion of the peirs and foundation were not inspected as part of this report, however experience with similar structures would imply that their condition would be better than the exposed components.

In conclusion, the Utah Dam structural stability will no longer support gate operation. Furthermore, continued use of the access platforms for pedestrian crossing will be dependent on future evaluation, repair and/or modification of those components.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

6.0 Hydrology and Hydraulics

The MDEQ has established the required spillway capacity at the Utah Dam to be 11,800 cfs (reference **Appendix B**). This equates to the 100 year frequency flood which is mandated by statute, P.A. 451, Part 315, Section 324.31516, for dams classified as low hazard such as the Utah Dam.

The hydraulic capacity of the Utah Dam is greatly impacted by the downstream Hamilton Dam. The normal impoundment elevation of the Hamilton Dam impoundment is approximately El. 708.0 (NGVD) while the gate sill elevation of the Utah Dam is 697.3. Thus, the Utah Dam is partially submerged under normal conditions.

Overtopping of the right embankment occurs at or near El. 714.0. The 1993 Acres Report (**Appendix B**) indicates that overtopping of this embankment will be experienced at flows over 7,830 cfs. The FEMA Flood Insurance Study (**Appendix B**) shows the 100 year flood elevation at the Utah Dam to be approximately El. 716.0. Thus the right embankment is overtopped under high flow conditions due to backwater impacts from the Hamilton Dam. It should be noted that the FEMA Flood Insurance Study assumes that all six gates are operable at Hamilton Dam. Since 1991 only three gates have been operable thus the backwater impact would be greater than shown on the FEMA maps.

The Utah Dam's hydraulic capacity is further diminished by the fact that the floodgates are currently locked in a partially open position. The bottom of gate elevation for each bay (numbered left to right locking downstream) is approximately:

Bay No. 1	708.5
Bays No. 2 and 3	710.5
Bays No. 4 through 6	713.0

Under high flows (100 year El. 716.0) the gates will impede flow thereby further exacerbating flood conditions.

For the above described reasons, it is concluded that the Utah Dam does not meet spillway capacity requirements as required by statute.

UTAH DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

7.0 Operation and Maintenance

The Utah Dam is operated and maintained by staff from the City of Flint Water Treatment Plant. The floodgates are currently non-functional and are locked in a partially open position. Power has been disconnected from the gate operators. The impoundment elevation is maintained by the downstream Hamilton Dam thereby negating the usefulness of the Utah Dam.

The City staff therefore maintains a minimal surveillance effort at the dam. Minimal preventative maintenance has been performed in the recent past. It is the City's intent to remove all or a portion of the structure as funds become available. Until that time maintenance will be limited to those items necessary to insure public safety with regard to the pedestrian bridge crossing.

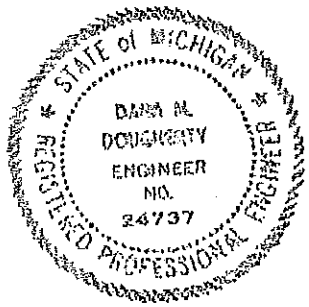
Appendix 7 - 2008 Hamilton Dam Safety Report

MICHIGAN PUBLIC ACT 451, PART 315
INSPECTION REPORT
HAMILTON DAM
GENESEE COUNTY, MICHIGAN
INVENTORY NUMBER 060 – HIGH HAZARD

FOR

CITY OF FLINT
WATER TREATMENT PLANT
4500 N. DORT HIGHWAY
FLINT, MICHIGAN 48505
ATTN: MR BRENT WRIGHT
(810) 787-6537

BY
Stantec Consulting Michigan Inc.
Engineers – Planners – Surveyors
3959 Research Park Drive
Ann Arbor, Michigan 48108-2219
(734) 761-1010



INSPECTOR(S): Dana M. Dougherty – Stantec Consulting Michigan Inc.

DATE OF INSPECTION: October 19, 2008

PROFESSIONAL ENGINEER: Dana M. Dougherty, PE
STANTEC CONSULTING MICHIGAN INC.
3959 RESEARCH PARK DRIVE
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Dana M. Dougherty, PE #24737

Stantec

INSPECTION REPORT
HAMILTON DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

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Stantec
INSPECTION REPORT
HAMILTON DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN

1.0 PURPOSE AND AUTHORITY

The purpose of this report is to present a summary of findings for the field inspection of the Hamilton Dam completed by Stantec Consulting Michigan Inc. on October 19, 2008 pursuant to the requirements of Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 P.A. 451, Section 31518.

This Dam Inspection Report and associated inspection activities were commissioned by the City of Flint, the dam owner. The Hamilton Dam is registered with the Michigan Department of Environmental Quality (MDEQ) as Dam Number 060.

References in this report to "left" and "right" are based on the observer facing downstream.

2.0 CONCLUSIONS AND RECOMMENDATIONS

The Hamilton Dam was inspected on October 19, 2008 in accordance with the Michigan P.A. 415, Part 315 criteria. The dam was found to be in poor condition which supports the conclusion found in previous dam safety reports. Specific comments/recommendations are as follows:

1. The stability of the exposed structural components including gate piers, access and operating platforms, and abutments is poor. These components are no longer capable of serving their intended purpose.

2. Three of the floodgates have been decommissioned while the reliability of the remaining gates is suspect. With three gates operating inadequate freeboard exists at the right embankment (looking downstream). In addition upstream flood elevations will be greater than those included in the FMEA Flood Insurance maps.

3. The MDEQ mandated drawdown should be adhered to until the dam is reconstructed.

4. The City should proceed immediately to implement the preferred option from the 2008 Reconstruction Feasibility Study.

5. In the interim, the City should exercise the Emergency Action Plan (EAP) annually to insure an efficient implementation when and if needed.

3.0 PROJECT INFORMATION

Hamilton Dam is located on the Flint River in downtown Flint, Michigan near the Flint Branch of the University of Michigan campus, and approximately 800 ft. upstream from the Saginaw Street Bridge.

Plans for the current dam are on file with the City of Flint, but original design data is not available. The dam was designed by Fargo Engineering Company of Jackson, Michigan, and was constructed about 1920 by Price Brothers Company of Lansing, Michigan on the site of a previous mill dam. The dam was constructed to sustain a head for the upstream water treatment plant intake.

The existing structure is a reinforced concrete gravity dam with six gated spillway bays. Each bay has a tainter gate on the fixed crest of a concrete spillway. The six bays, each 33 ft. long, and the five piers, each four feet thick, make a total length of 218 ft. There is an end sill below the spillway and an 18 ft. concrete apron beyond the end sill. The gates are operated during flood flows.

The original 1920 dam had seven bays with tainter gates. In 1964, the southern (left) most gate, its spillway and headrace were removed.

A fish ladder was constructed through the right abutment sidewalls in 1978. Also in 1978, the right concrete abutment was modified to install an Archimedean screw pump.

Repairs to Hamilton Dam were carried out in the summer of 1992. Steel sheet piling was placed just upstream of the gates for Bays 1, 2 and 6 because of the deteriorated condition of the gates. The sheet piles were to maintain the headpond in case of gate failure. The top elevation of the sheet piles was placed near the top of the tainter gates (Elev. 707.8 ft.) in a closed position. Gate repairs were completed in Bays 3, 4, and 5. These repairs included the complete removal of the existing gates and replacement with new gates, repair of buttress and sill concrete, repair of gate trunnions, replacement of lift chains, and painting of all exposed gate steel.

The top deck of the structure is divided lengthwise into a pedestrian walkway and the gate hoist rails for the two gate hoists. The hoist rails consist of two "I" beams (18 inch and 15 inch) that are supported by the piers. The two hoists for raising the spillway tainter gates are driven by attached electric motors.

A U.S. Army Corps of Engineer's bronze disk is set flush with the bridge deck in the walkway at the second pier from the right end. Unless otherwise noted, data given in this report is based on the assumption that the El 715.06 ft. elevation given for this benchmark is on National Geodetic Vertical Datum (NGVD).

The terrain near the dam and reservoir is urban and gently rolling. Five borings from the original plans show sand with an occasional pocket of clay or gravel in the soils overlying a soft sandstone which is 40 or 50 ft. below ground surface.

Six spillway bays and tainter gates make up the structure. Only Gates 3, 4 and 5 are currently operable. Sketches and pertinent data about Hamilton Dam are shown in **Appendix A.**

Hamilton Dam was classified by the U.S. Army Corp of Engineers as High Hazard in the 1980 Phase I Inspection Report. This classification remains in effect to date.

Plans for the original Dam construction in 1920 and plans for repairs performed in 1992 are on file with the City of Flint. Past inspection reports on file include the following:

- 1980 USACE, Phase I, National Dam Safety Program Report
- 1986 Ayres, Lewis, Norris & May, Inc. (ALNM) and Sublakes Diving Inspection Report
- 1988 MDNR Inspection Report
- 1989 Ayres, Lewis, Norris & May, Inc. (ALNM) Structural Evaluation and Reconstruction of Hamilton Dam Report
- 1993 Acres International Corp., Dam Inspection Report
- 1996 Ayres, Lewis, Norris & May, Inc. (ALNM) Inspection Report
- 1999 Paul C. Rizzo Associates, Inc. Dam Inspection Report
- 2000 USACE Hamilton Dam Condition Survey
- 2005 Soil & Materials Engineers, Inc. Dam Inspection Report
- 2008 Stantec Feasibility Study for Reconstruction

These reports have been consistent in their recommendations to undertake corrective action to address structural deficiencies within the facility. The 1989 Ayres, Lewis, Norris & May, Inc. (ALNM) and 2000 USACE Reports included estimated costs of $3,830,000 and $5,588,000 respectively to make the necessary improvements to insure dam safety and integrity. The 2008 Stantec Report estimated the reconstruction cost to be $4,901,000.

On March 14, 2008, acting under the authority of Part 315, Dam Safety of the Natural Resources and Environmental Protection Act, 1994 P.A. 451 as amended, the Michigan

Stantec

INSPECTION REPORT
HAMILTON DAM
CITY OF FLINT
GENESEE COUNTY, MICHIGAN
PROJECT INFORMATION
December 2008

Department of Environmental Quality issued an order to the City of Flint to drawdown the Hamilton impoundment 3.25 ft. to an elevation not greater than 705.25 NGVD for the purpose of public health, welfare and safety protection. The depth of necessary drawdown was computed by the MDEQ to eliminate the danger of loss of life downstream in the event of a sudden dam failure.

A permit under Part 301, Inland Lakes and Streams was issued for this activity on September 30, 2008. The City of Flint has subsequently abided by the conditions of this permit and has lowered the normal impoundment elevation to the prescribed elevation. It should also be noted that the MDEQ permit requires permanent deflation of the Obermeyer (Inflatable) Dam.

4.0 FIELD INSPECTION

An inspection of the facilities was performed on October 19, 2008 by Dana M. Dougherty, PE. The weather on the date of the inspection was clear with temperatures at approximately 55°F. The impoundment elevation was below normal by approximately 1.5 ft. The City was in the process of lowering the impoundment per directive from the MDEQ. This directive requires that the impoundment be lowered 3.25 ft. The floodgate in Bay #3 has been opened to accomplish this task.

The following items were noted during the field inspection (referenced photographs can be found in **Appendix C**):

1. The condition of the exposed concrete including piers, slabs, abutments is poor with numerous spalls, cracks and exposed reinforcing steel (Ref. Photos #1 through #4, #7, #8, #10).

2. The floodgates in Bays 1, 2 and 6 have been decommissioned by placement of steel sheeting across the face of these bays (Ref. Photos #2 and #8).

3. The City reports that the remaining floodgates (Bays 3 through 5) are operative, however, Bays 4 and 5 have not been operated with any frequency and thus their reliability is suspect.

4. The access walkway/platform remains closed to the public due to safety concerns (Ref. Photos #3 and #4).

5. Overall the condition of the dam continues to worsen with the structural integrity of numerous components compromised.

5.0 STRUCTURAL STABILITY

The assessment of stability is based on a visual observation made during our field inspection (10/19/08) and visual observations made during preparation of the 2008 Reconstruction Feasibility Study, as well as the 1989 condition survey (concrete corings).

The overall structural condition of the Hamilton Dam is poor. Exposed surfaces including gate piers, access and operating platforms and abutments all exhibit conditions that indicate these components have exceeded their useful life. Numerous spalls, cracks and exposed reinforcing steel exist.

In conclusion, the Hamilton Dam structural stability is deficient and thus this facility represents a potential liability with regard to public health, welfare and safety.

6.0 HYDROLOGY AND HYDRAULICS

The dam is regulated under State of Michigan P.A. 451 Part 315 statute. Guidelines that accompany this statute require high hazard potential dams with heights less than 40 ft. to be capable of passing a 200-year flood or the flood of record whichever is greater. For the Hamilton Dam, the 200-year flood controls and has been computed by the Michigan Department of Environmental Quality to be 13,000 cfs (reference **Appendix B**).

The computed maximum impoundment elevation for the 200-year flood event varies dependent on assumptions made with regard to the number of floodgates that are operative. In 1981, calculations were performed by the United States Geologic Survey and form the basis for the FEMA Flood Insurance mapping that is used to this day. The USGS assumed that all six floodgates were operational. The USACE also computed the maximum impoundment elevation in their 1981 National Dam Safety Inspection Report. They assumed that just two gates were operational due to the fact that the gates could not be locked in an open position and only two operators existed. In 1993 after decommissioning of Gates 1, 2 and 6, Acres International Corporation computed the maximum headwater elevation assuming that gates were operational in Bays 3, 4 and 5.

The results of these various studies is as follows (refer to **Appendix B** for more information):

Source	Estimated 200-year Impoundment Elevation NGVD Datum
1981 F.I.S. (U.S.G.S.)	709.05*
1981 Dam Safety Inspection Report (USACE)	711.6
1993 Dam Safety Inspection Report (ACRES)	712.8

** USGS added 0.95' to the computed impoundment elevation for the purpose of floodplain mapping. Therefore the floodplain mapping indicates a 200-year flood elevation of approximately 710.0 NGVD.*

It should be noted that there is uncertainty as to whether or not adequate freeboard exists at this site. The Acres report indicates that freeboard is sufficient based on the fact that the upstream right streambank area was raised in the mid 1980's. However, a recent survey conducted as part of the 2008 Reconstruction Feasibility Study indicates the elevation of this area to be similar to that shown in the 1981 USACE report i.e. ± 711.5 NGVD. Thus, it would appear that inadequate freeboard currently exists.

7.0 OPERATION AND MAINTENANCE

The Hamilton Dam is operated and maintained by staff from the City of Flint Water Treatment Plant. Floodgates in Bays 1, 2 and 6 are currently non-functional. Floodgates in the remaining bays can be operated, however their reliability is diminished due to the deteriorated condition of the operating slab.

City staff maintains the impoundment elevation by operating the gates on an as needed basis. The impoundment is currently being maintained at the MDEQ mandated level of 705.25 NGVD i.e. 3.25 ft below normal.

The City has performed minimal maintenance to the structure in anticipation of reconstruction.

Appendix 8 - Cost of Service Study – Flint Water Treatment Plant

DRAFT

Technical Memorandum
Cost of Service Study
Flint Water Treatment Plant

I. Introduction

This Technical Memorandum describes the proposed improvements needed at the Flint Water Plant to treat Flint River water on a continuous basis. The primary foundations for this evaluation were the "Water Treatment Plant Rehabilitation – Phase II" report dated December 2003 and the "Preliminary Engineering Report, Lake Huron Water Supply, Karegnondi Water Authority" dated September 2009. The findings, as presented in the following sections, address the improvements required for the water plant to produce finished water in conformance with the current federal and state drinking water regulations. In addition, operation and maintenance costs for continuous operation have been evaluated and included in order to determine the total cost associated with using the Flint River as a source of water.

Improvements, as proposed in this evaluation, along with those previously made during the Phase I improvements program, will produce a finished water quality equal to the current water quality as received from the DWSD. The design parameters are as follows:

1) Minimum Day Demand – 10-mgd
   Average Day Demand – 15-mgd (14-mgd in 2010 increasing to 15-mgd in 2050)
   Maximum Day Demand – 28-mgd

2) Turbidity – 0.20 NTU

3) Hardness – 80 to 100 mg/l as $CaCO_3$

4) Cryptosporidium – 3-Log Inactivation

5) Giardia – >3-Log Inactivation

6) Viruses – >4-Log Inactivation

7) Taste and Odor – Eliminated with pre-ozonation

8) Trihalomethanes – Less than 80 µg/l

9) HAA5 – Less than 60 µg/l

As part of this investigation, an inspection of the Flint Water Plant was performed on May 3, 2011. The purpose of this inspection was to determine if the recommendations in the Phase II report, as referenced above, needed to be revised due to changed conditions or water supply needs. Based on findings from this meeting, the major adjustment to be made is the reduction of average day demand from 20-mgd to 14-mgd and maximum day demand being reduced from 36-mgd to 28-mgd. Required improvements as recommended in this study have taken these new demands into account. The conceptual design of these new facilities would allow cost effective expansion to 36-mgd, as needed, to meet future demands.

II. Required Capital Improvements

The following describes the required improvements as required for the Flint Water Plant to operate on a continual basis using the Flint River as a water source. Most of these improvements are more fully described in the Phase II report and are not repeated to avoid duplicative effort.

A. Lime Sludge Disposal

Lime sludge is proposed to be pumped from the east and west softening basins to two new 42-ft diameter thickeners (25-ft SWD) located adjacent to the plate settling building. Decant from the thickener will flow by gravity to the primary clarifier influent channel. Thickened sludge (12% solids) will be pumped to a new plate-and-frame filter press located at the north end of the WTP 1 primary settling basin. A new two-story building would be constructed at that location to house the pumping facilities and presses. Each press, located on the second floor, will have a 225-cf per hour capacity and will drop the dewatered sludge into a first floor bunker area. The dewatered cake will be transferred to a lime storage concrete bunker located approximately 60 feet north of the sludge press building. The storage bunker (100-ft x 192-ft) will have the capacity to store three to four months of dewatered lime sludge cake. About every three months, contract haulers will remove the lime sludge and place on agricultural lands that are permitted for final disposal.

The capacities of these facilities are based on average day flow of 15-mgd, maximum day demand of 28-mgd and water quality softening requirements. Based on raw water quality data provided by the City of Flint, a lime dosage of 209 mg/l, soda ash dosage of 47 mg/l and carbon dioxide dosage of 37 mg/l were used to estimate lime sludge quantities and flows.

Opinion of Probable Cost:

Site and Access:			
Site Demolition	$ 129,000		
Roadway Improvements	$ 385,000		
Partial Settling Basin Demolition	$ 129,000		
On-site Truck Scale	$ 257,000		
	Subtotal Construction:	$ 900,000	
	Construction Contingencies (15%):	$ 135,000	
	Design Contingencies (5%):	$ 45,000	
	Engineering, Legal, Bonds & Administration (17%):	$ 153,000	
		Opinion of Probable Cost:	**$ 1,233,000**

Thickener Basins - 42 ft Diameter:			
Two Thickener Mechanisms	$ 310,000		
Two Concrete Basins (25 ft SWD)	$ 513,000		
Two Geodesic Dome Covers	$ 180,000		
Install Equipment	$ 257,000		
Site Work	$ 97,000		
Utilities, Piping and Process	$ 193,000		
	Subtotal Construction:	$ 1,550,000	
	Construction Contingencies (15%):	$ 232,500	
	Design Contingencies (5%):	$ 77,500	
	Engineering, Legal, Bonds & Administration (17%):	$ 263,500	
		Opinion of Probable Cost:	**$ 2,124,000**

Filter Presses and Building:			
Two-225 cf Plate & Frame Press	$ 1,650,000		
Building (70 ft x 60 ft)	$ 3,331,000		
MEP	$ 1,089,000		
Site Utilities	$ 129,000		
	Subtotal Construction:	$ 6,199,000	
	Construction Contingencies (15%):	$ 929,850	
	Design Contingencies (5%):	$ 309,950	
	Engineering, Legal, Bonds & Administration (17%):	$ 1,053,830	
	Opinion of Probable Cost:		**$ 8,493,000**

Lime Storage Bunker and Site Work:			
12 ft Concrete Walls and Slab	$ 833,000		
Frame and Fabric Building Cover	$ 325,000		
Site Improvements	$ 385,000		
Front End Loader (5 cyd)	$ 308,000		
Site Utilities	$ 513,000		
	Subtotal Construction:	$ 2,364,000	
	Construction Contingencies (15%):	$ 354,600	
	Design Contingencies (5%):	$ 118,200	
	Engineering, Legal, Bonds & Administration (17%):	$ 401,880	
	Opinion of Probable Cost:		**$ 3,239,000**
	Total for Lime Disposal :		**$ 15,089,000**

B. Soda Ash Feed System

In order to remove the non-carbonate hardness, soda ash will be needed to meet the finished water hardness concentrations. Two new 800 #/hour feeders will be needed to meet the dosage requirements. Each of these feeders will be connected to the existing silos.

Opinion of Probable Cost:

Demolition of Existing Feeders	$ 20,000		
Two 800 #/hr Feeders	$ 112,000		
MEP	$ 109,000		
Chemical	$ 77,000		
New Pneumatic Fill System	$ 58,000		
	Subtotal Construction:	$ 376,000	
	Construction Contingencies (15%):	$ 56,400	
	Design Contingencies (5%):	$ 18,800	
	Engineering, Legal, Bonds & Administration (17%):	$ 63,920	
	Opinion of Probable Cost:		**$ 516,000**

C. Additional Chemical Storage

During the Phase I improvements, the MDEQ did not mandate 30-day chemical bulk storage requirements since the plant was a redundant water supply to the DWSD. However, if the facility becomes a continuously operated treatment plant, then additional chemical storage must be added to meet the minimum storage volume requirements. To comply with the regulations, new oxygen, nitrogen and carbon dioxide storage facilities must be provided as follows.

Liquid Carbon Dioxide:
- Capacity – 34 tons
- Vaporizer – 750 #/hour @ 300 psig
- Piping – Schedule 80 Carbon Steel and Schedule 40 - 304L Stainless Steel

Liquid Oxygen
- Capacity – 9000 gallons
- Operating pressure – 75 psi
- Feed Rate – 175 scfm
- Piping – Type K Copper

Liquid Nitrogen
- Capacity – 540 gallons
- Operating pressure – 100 psi
- Feed Rate – 1 scfm
- Piping – Type K Copper

Opinion of Probable Cost:

Carbon Dioxide Storage Facilities	$	328,000	
MEP	$	103,000	
Oxygen & Nitrogen Storage Facilities	$	961,000	
MEP	$	109,000	
Subtotal Construction:			$ 1,501,000
Construction Contingencies (15%):			$ 225,150
Design Contingencies (5%):			$ 75,050
Engineering, Legal, Bonds & Administration (17%):			$ 255,170
Opinion of Probable Cost:			**$ 2,057,000**

D. Electrical and SCADA Improvements

Section 9, relating to power and controls, of the Phase II study was prepared by Dmytryka Jacobs Engineers (DJE). The scope of the Phase II work did not include detailed investigations of the water plant site-wide power distribution nor the secondary power distribution within each of the facility structures. However, a number of observations and basic recommendations were presented in Section 9 by DJE.

The Flint Water Plant currently uses 2400V as primary power throughout the facility. All of the power feeders in the plant site are 5kV rated and it appears the existing switchgear is also rated at 5kV. Most of the major electrical improvements installed during Phase I were dual voltage (2400/4160) equipment in anticipation of the plant power being changed to 4160V in the near future. This change would allow the existing network of power feeders to handle approximately twice the power and would eliminate running new feeders to various portions of the plant.

The current sub-station has two 2.5MVA transformers running in parallel for a total capacity 5 MVA. These old transformers are not equipped with cooling fans. The full connected load to these transformers is estimated to be 6.97 MVA while the estimated power load at 36 MGD is 4.22MVA. Based on these estimates there is sufficient power for the plant with both sub-station transformers in service. Even though the transformers are owned by Consumers Energy, it could take weeks to replace one of these main transformers in the event of a unit failure, which will result in reduced treatment and pumping capacity. The sub-station switchgear was installed in 1960 and is antiquated and difficult to maintain.

The two existing Fairbanks Morse generators are currently inoperable and would cost approximately $1M to rehabilitate. The DJE team recommended installing two new emergency generators in lieu of re-building the existing units.

Section 9 of the Phase II report provides sufficient detail for the purposes of this report, but a detailed electric system evaluation of the entire plant should be performed prior to any major improvements to this facility.

While LAN did not perform a detailed review of the WTP electrical system during our site visit, it appears that all of the DJE findings are still pertinent. We, therefore, concur with the improvements as recommended by DJE in the Phase I report.

Opinion of Probable Cost:

Substation Upgrade	$ 961,000	
Standby Power Generation	$ 2,242,000	
Pump Station No. 4 Upgrade	$ 1,365,000	
Filter Press Building Feeder	$ 87,000	
WTP SCADA, Equipment & Programming	$ 720,000	
Telemetry System Equipment & Programming	$ 103,000	
Computers, Software & Training	$ 155,000	
Filter Transfer PS Power Feeders	$ 135,000	
Emergency PS Power Feeders	$ 145,000	
Subtotal Construction:		$ 5,913,000
Construction Contingencies (15%):		$ 886,950
Design Contingencies (5%):		$ 295,650
Engineering, Legal, Bonds & Administration (17%):		$ 1,005,210
Opinion of Probable Cost:		**$ 8,101,000**

E. Post-Chlorination and Zebra Mussel Control

The previous report recommended changing the disinfection system from gaseous chlorine to sodium hypochlorite due to the potential for hazardous gas release and the requirements imposed by new federal regulations. Previous treatability studies have not addressed the potential impact of re-growth in the system due to ozonation by-products. These impacts should be addressed prior to proceeding with final plans for using river water.

The Flint River is known to be infested with Zebra mussels and mitigation measures will have to be implemented if the plant is placed into continuous operation. A sodium permanganate feed system is proposed to address these concerns.

Opinion of Probable Cost:

Demolition of Existing Equipment	$ 39,000		
Storage Tanks	$ 9,000		
Metering Pumps and Tables	$ 11,000		
Piping, Valves & Tables	$ 9,000		
Containment	$ 59,000		
Installation	$ 108,000		
	Subtotal Construction:	$	235,000
	Construction Contingencies (15%):	$	35,250
	Design Contingencies (5%):	$	11,750
	Engineering, Legal, Bonds & Administration (17%):	$	39,950
	Opinion of Probable Cost:	**$**	**322,000**

F. Security Issues

For water plant security issues, please refer to City of Flint Vulnerability Assessment. Details are omitted in this report due to confidentiality.

Not available at the time of the previous report, a source water monitoring system is included in the study due to recent advancements in technology. The proposed system design is based on Hach Model SC1000, equipped with UVAS, NH4D, pH, ORP, turbidity and DO probes.

Opinion of Probable Cost:

Security Improvements	$ 145,000		
Source Water Monitoring System	$ 95,000		
	Subtotal Construction:	$	240,000
	Construction Contingencies (15%):	$	36,000
	Design Contingencies (5%):	$	12,000
	Engineering, Legal, Bonds & Administration (17%):	$	40,800
	Opinion of Probable Cost:	**$**	**329,000**

G. PS No. 4 - Low and High Service Pumps

Section 7 of the Phase II report included recommendations to replace two of the low lift pumps and two of the high lift pumps along with various other improvements. During the site visit, it was apparent the condition of this facility has continued to deteriorate. Furthermore, with the reduction in water system demands, the various pump capacities are no longer properly sized to efficiently meet the new plant flow ranges. The pumps and motors are oversized and are operating outside their best efficiency ranges and should be replaced due to age, condition and cost to operate.

Additionally, some of these pumps cannot be operated due to excessive vibrations in the shaft and steady bearings. Existing vibration monitors are functioning as designed and are shutting the power off to the motors to avoid damage.

For low lift service, it is proposed to install two 10-mgd and two 15-mgd (nominal ratings) vertically mounted pumps equipped with low voltage inverter duty motors. The motors would be powered by low

voltage variable frequency drives. This will provide a firm rated capacity of approximately 35-mgd in low lift capacity.

For high lift service, it is proposed to install one 10-mgd, two 15-mgd and one 20-mgd (nominal ratings) pumps equipped with medium voltage inverter duty motors. These motors will be power by medium voltage variable frequency drives. This combination of pumps will provide a firm rated capacity of 40-mgd.

Opinion of Probable Cost:

Demolition of Existing Equipment	$	135,000	
Install Two (2) 10 MGD @ 40 ft of TDH Vertically Mounted Pumps with 125 HP, 480 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	$	473,000	
Install Two (2) 15 MGD @ 40 ft of TDH Vertically Mounted Pumps with 150 HP, 480 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	$	495,000	
Install One (1) 10 MGD @ 190 ft of TDH Vertically Mounted Pump with 450 HP, 4160 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	$	245,000	
Install Two (2) 15 MGD @ 190 ft of TDH Vertically Mounted Pumps with 700 HP, 4160 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	$	520,000	
Install One (1) 20 MGD @ 190 ft of TDH Vertically Mounted Pump with 800 HP, 4160 V Inverter Duty Motor with 20 ft of Shaft & Steady Bearings	$	285,000	
Piping, Valves, Supports & Bearings	$	480,000	
Intermediate Platforms, Ladders & Stairs	$	360,000	
Ventilation & Boiler Systems	$	340,000	
Install Three (3) Low Voltage VFD Units	$	85,000	
Install Four (4) Medium Voltage VFD Units	$	2,250,000	
Subtotal Construction:	$		5,668,000
Construction Contingencies (15%):	$		850,200
Design Contingencies (5%):	$		283,400
Engineering, Legal, Bonds & Administration (17%):	$		963,560
Opinion of Probable Cost:	**$**		**7,766,000**

H. Filter Transfer Station to Dort Reservoir and UV Inactivation

Under the requirements as outlined in the USEPA drinking water regulations addressing potential microbial contaminants, additional treatment technologies and enhancement of existing processes must be implemented to comply with these regulations.

As required under the enhanced surface water treatment rules, it is essential for water utilities to address giardia, cryptosporidium, viruses and bacteria in finished water. The level of treatment is dependent on

the source water classification. The City of Flint will need to perform a two-year source water study to determine the bin placement for the Flint River. For the purposes of this report, a Bin 4 placement was selected due to the nature of the watershed and, therefore, it is assumed enhanced Ct and UV inactivation will be required.

Reservoir No. 3 does not provide sufficient Ct to meet the current regulations, therefore, Dort Reservoir will need to be placed into the process train. Since Dort Reservoir does not match the hydraulic profile of the plant, an intermediate pump station will be required. This new facility will also include a UV inactivation system to comply with the enhanced water quality regulations.

This proposed facility, located west of the filters and south of Dort Reservoir, will house three 14-mgd (nominal rating) variable speed pumps with inverter duty, low voltage motors for a firm rated capacity of 28-mgd. Housed in a separate part of this same structure will be the UV system that will be equipped with three 12" medium pressure units with a rated capacity of 28-mgd.

Opinion of Probable Cost:

Site Work & Utilities	$ 77,000	
Building (80 ft x 60 ft)	$ 1,440,000	
Three (3) 14 MGD @ 40 ft of TDH, Vertically Mounted Pumps with 150 HP, 480 V Inverter Duty Motor	$ 535,000	
MEP	$ 940,000	
Valves and Controls	$ 205,000	
Install Three (3) 12" MP UV Units	$ 590,000	
UV Piping & Controls	$ 368,000	
Ventilation & Boiler Systems	$ 165,000	
Install Three (3) Low Voltage VFD Units	$ 85,000	
Piping Connections	$ 125,000	
200 ft of 30" Water Main	$ 200,000	
600 ft of 36" Water Main	$ 420,000	
Subtotal Construction:		$ 5,150,000
Construction Contingencies (15%):		$ 772,500
Design Contingencies (5%):		$ 257,500
Engineering, Legal, Bonds & Administration (17%):		$ 875,500
Opinion of Probable Cost:		**$ 7,056,000**

I. Emergency Interconnect Pumping Station

The City of Flint and Genesee County DWWS have entered into an agreement to provide 8-mgd of back-up service to each other under emergency conditions. There are several alternatives for pumping station locations and configurations to accomplish this interconnect. For the purposes of this report, a station located west of the filter building was selected as the most practical from and operational cost perspective. While the opinions of cost presented below indicate that these pumps will be housed in their own structure, it is feasible to house the pumps in the filter transfer station for potential savings.

Preliminary design for this pumping station include two constant speed 8-mgd pumps equipped with soft starts and medium voltage motors. A reverse flow control station will be included within the same structure to allow for flow from the DWWS to assist the City of Flint. Approximately three miles of 24-inch pipeline will be needed to connect the two systems.
Opinion of Probable Cost:

Site Work & Utilities	$ 90,000	
Building (32 ft x 24 ft)	$ 245,000	
Install Two (2) 8 MGD @ 290 ft of TDH, Vertically Mounted Pumps with 600 HP, 4160V Motor	$ 380,000	
MEP	$ 335,000	
Valves and Controls	$ 128,000	
Reverse Flow Control Station	$ 110,000	
Ventilation Systems	$ 35,000	
16000 ft of 24" Water Main	$ 4,992,000	
Subtotal Construction:		$ 6,315,000
Construction Contingencies (15%):		$ 947,250
Design Contingencies (5%):		$ 315,750
Engineering, Legal, Bonds & Administration (17%):		$ 1,073,550
Opinion of Probable Cost:		**$ 8,652,000**

The opinions of capital cost presented in the preceding sections are tied to an ENR Index of 8688 to match the September 2009 Lake Huron Water Supply Report. Furthermore, the contingency percentages included with each opinion of cost are the same as in the September 2009 report. The total opinion of probable project cost of these proposed improvements is as follows:

Lime Sludge Disposal	$ 15,089,000
Soda Ash Feed System	$ 516,000
Additional Chemical Storage	$ 2,057,000
Electrical and SCADA Improvements	$ 8,101,000
Post-Chlorination and Zebra Mussel Control	$ 322,000
Security Issues	$ 329,000
PS No. 4 - Low & High Service Pumps	$ 7,766,000
Filter Transfer Pumping Station & UV	$ 7,056,000
Emergency Interconnect Pumping Station	$ 8,652,000
Total Opinion of Probable Project Cost:	**$ 49,888,000**

III. Cost of Additional Operation

The City of Flint currently operates the water treatment plant periodically during the year to maintain the systems and to meet regulatory requirements. The water treatment plant is staffed with various classifications of employees to operate and maintain the facility for these minimal operations.

As part of this work, and to develop all costs of providing water service from the Flint River, it is necessary to determine the probable cost for operating and maintaining this facility for continuous operation. Water quality differences between the Flint River and Lake Huron are significant and require different treatment chemicals and dosages. Most noticeable is the fact that Lake Huron water does not require softening which negates the need for softening process and the associated lime sludge disposal.

The primary cost parameters that are included in this difference are labor, chemicals, residual disposal and electrical power. Each will be discussed in the following sections. These costs were projected through the year 2050.

A. Labor

Additional staffing was discussed and developed with representatives from the City of Flint to provide full time coverage on a 24/7/365 schedule, plus provide staff for residual management and operations of the various dams. Hourly rates and fringe benefits were based on current budget figures and inflated at a rate of 3% for future costs. The following table outlines the proposed staffing a cost for this operational element.

Classification	Number	Cost/Hr	Hrs/Year	Total	Fringe (%)	Total
Operators	12	$ 20.00	2080	$ 499,200	90.40%	$ 950,477
Maintenance	4	$ 25.00	2080	$ 208,000	90.40%	$ 396,032
Laboratory QA/QC	2	$ 24.00	2080	$ 99,840	90.40%	$ 190,095
Laboratory SDWA	2	$ 20.00	2080	$ 83,200	90.40%	$ 158,413
Planned Overtime	NA	MIXED	8320	$ 178,048	90.40%	$ 339,003

This estimate represents approximately $2,034,000 per year of additional labor.

B. Chemicals

Chemical costs are based on the projected average day water demand of 14-mgd and the average dose for each of the chemicals based on the raw water quality information and other operational records. Further, data from the previous treatability work performed during the Phase I improvements was also incorporated into these estimates. Chemical suppliers and other water utilities were contacted to obtain current chemical purchase costs which were adjusted by the ENR ratio back to an index of 8688. Where necessary, transportation costs to the Flint, MI area were included. The following summarizes the chemical costs associated with treating the Flint River water.

Chemical	Dose(mg/l)	Cost/#	Cost/ MGD
Ferric	44.50	$0.24	$89.07
Lime	209.00	$0.10	$174.31
Soda Ash	47.00	$0.29	$113.67
CO_2	37.00	$0.10	$30.86
Cl_2	3.00	$0.34	$8.51
Fluoride	1.00	$0.33	$2.75
Phosphate*	1.00	$0.51	$4.25
		Cost per MGD	$423.42

*Costs range from $0.51 to $0.96 per pound

In addition to the above, the cost of ozone will need to be added which is approximately $20.08 per million gallons per day per mg/l dose. This cost includes oxygen, nitrogen and power costs.

C. Residual Disposal

This category is divided into two groups: clarifier sludge collected in the plate settling basins and lime sludge from the softening process. The clarifier sludge is pumped from the clarifier basins by zone (six zones per train, three trains, total of 18 zones) to the plant main drain. As part of the Phase I work, the main drain was connected to a new wastewater pumping station located south of the filter gallery building. This pump station discharges the collected residuals to the city's sanitary sewer system. Nearly all of the filter wash water is recirculated back to the head of the ozone facility for re-use.

The cost to treat clarified sludge discharged into the sanitary sewer system is calculated as follows:

Plate Clarifier Sludge	
Flow (MGD)	14
SS (mg/l)	75
Primary Sludge (#/d	13,435
% Solids	2%
Sludge (gals/day)	80,500
Sludge (cf/day)	10,762

Based on the City of Flint's current wastewater charges of $1.00 per 100 cf, the annual cost would be $39,200 per year.

Lime/Soda Ash softening generates large quantities of residual wastes that have high disposal costs. The treatment proposed in this study involves pumping the sludge, at about 4% concentration, from the softening basins to two gravity thickeners, where it will concentrate to about 12% solids. After thickening, sludge will be pumped to the filter presses to be dewatered to approximately 55% solids. The filter presses will drop the cake into a lower bunker where it will be removed by an end loader to the main storage bunker. About every three months, the sludge will be loaded onto trucks and applied to agricultural land.

The volume of sludge is estimated as follows:

Sludge Production from Clarifier

Reaction	meq/l	meq/l as $CaCO_3$	meq/l as $Mg(OH)_2$
CO_2	0.25	0.25	0
$Ca(HCO_3)_2$	4.65	9.30	0
$Mg(HCO_3)_2$	0.30	0.60	0.30
$MgSO_4$	0.89	0.89	0.89
Excess Lime	1.25	1.25	0
Total meq/l		12.28	1.19
Less Practical Limits meq/l		0.60	0.20
Precipitate Produced meq/l		11.68	0.99
Precipitate Produced mg/l		584	49
Precipitate Produced #/MG		4872	412
Total #/MG		5284	

WTP Flow (MGD)	14	27		
Dry Sludge Production in #/day	73,983	142,681		
@ 4% Solids (gals/day)	221,771	427,701		
@ 12% Solids (gals/day)	73,924	142,567		
@ 12% Solids (gals/week)	517,466	997,970		
Dry Sludge Production (tons/week)	259		SG $CaCO_3$	2.71
Number of Hours per Week to Press	48		SG $Mg(OH)_2$	2.36
Dry Sludge Processed (#/hr)	10,789		SG solids	2.68
@ 55% Solids Sludge Processed (#/hr)	19,617			
55% Solids Sludge (#/cy)	2571		Sludge Solids =	55% as $CaCO_3$
@ 55% Solids Sludge Processed (cf/hr)	206		Sludge Unit Wt. =	95.22 pcf

Based on the preceding, 471 tons of softening sludge at 55% solids will be handled each week based on average flow and chemical dosage. Several Michigan water facilities were contacted to obtain lime sludge hauling and disposal costs. From this data a rate of $18.50 per wet ton was selected as a reasonable rate for disposal cost. This rate will result in an annual cost of $453,000.

D. Power

Practically all of the additional power costs are associated with low lift, intermediate transfer and high service pumping. Additional power costs will be used for process and handling of the softening sludge. The City of Flint is currently paying $0.07 per kwhr for service at the water plant. Power costs are calculated as follows:

TDH (ft) - High	190
TDH (ft) - Filter Transfer	40
TDH (ft) - Low	40
TDH Total (ft)	270
Pump Eff. (W to W)	80.00%
$/kwhr	$0.070
Pumping Cost Per MGD	$99.51
Solids Handling per MGD	$4.98
Total Power Cost per MGD	$104.49

Annual costs associated with the operation and maintenance of the Flint Water Plant are summarized in the attached tables following this section.

IV. Project Implementation Schedule

There are a number of issues that will impact the implementation schedule for this work. The source water studies to define bin number associated with cryptosporidium and giardia will take approximately two years. Part of these studies can be performed concurrently with design, but sufficient work will need to be performed to avoid impacting design schedule or work. A planning period of one year should be allowed for preliminary water quality and regulatory evaluations prior to initiating design work. Design of this project will require 10 to 12 months, with an additional three months required for permitting. After permits are received, allow three months for bidding and contract execution. Major equipment procurement and construction will take from 24 to 30 months. Plant commissioning will take about 2 months.

Total time required from notice to proceed to project completion 52 months to 60 months. This time frame does not include financing issues.

Rennaker, Joanne (DEQ)

From: Benzie, Richard (DEQ)
Sent: Thursday, September 17, 2015 4:01 PM
To: Busch, Stephen (DEQ)
Cc: Shekter Smith, Liane (DEQ)
Subject: Fw: Flint Sample Results

Please assist Tom. You may want to call him to explain why they were collecting fewer samples in 2015 (population decline, failure of 100+ homeowners to submit samples, etc.) and that all sampling sitesare still Tier 1. Thanks.

From: Poy, Thomas <poy.thomas@epa.gov>
Sent: Thursday, September 17, 2015 3:49:24 PM
To: Shekter Smith, Liane (DEQ); Benzie, Richard (DEQ)
Subject: Flint Sample Results

Liane/Richard: Can you please send me copies of Flint's lead compliance monitoring sampling results for 2014? I've got the January – June 2015 sample results from you last week. I want to take a look at the results and the locations.

Thanks.

Tom

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

Rennaker, Joanne (DEQ)

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
Attachments: Flint Scenarios FY 2013-14.pdf; Recent DWSD Flint Supply Cost Options.pdf; TYJT Recommendaton DWSD vs Flint.pdf; flint water supply assessment final report 2-6-13.pdf; KWA - DWSD for WRD.docx

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 ple3ase 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 reivew and coordinate this with with Liane Shekter Smith and/or Bill Creal and their appropirate 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.

Mlary 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 *(Flint Portion)***	12,574,900	379,304	13.01	*20.39*
2	**Suggested Cct *(Flint Portion)***	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			DWSD Investment	
		Avg Day *mgd*	Max Day *mgd*	Peak Hour *mgd*	CTA *$*	Flint Only *$*
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)

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

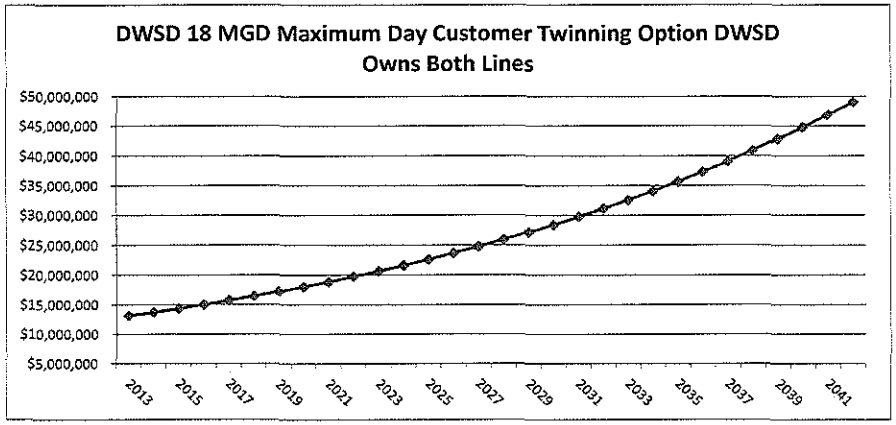
Flint WTP O&M:	-	/MCF	$ -	/Yr
DWSD:	$ 17.08	/MCF	$ 10,001,390	/Yr

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 Cummulative
$ 458,060,853

30 Yrs Cummulative
$ 631,244,349

DWSD Worksheet : 18 MGD Maximum Day Customer with Model Contract Twinning Line and Owning Only New Line 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

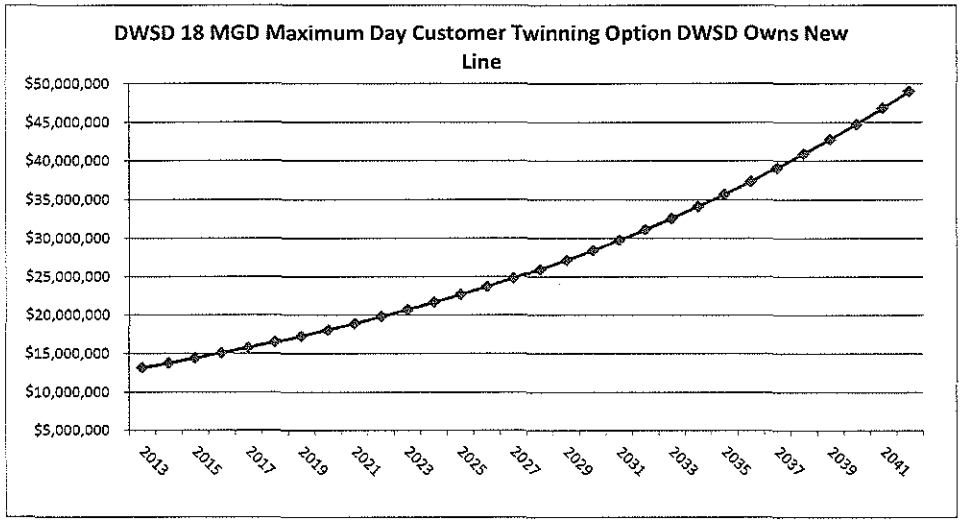
Flint WTP O&M:	-	/MCF	$ -	/Yr
DWSD:	$ 17.40	/MCF	$ 10,188,770	/Yr

Escalation/Inflation Rate

Flint:	4.51% /Yr
DWSD:	4.7% /Yr

Capital Expenditure

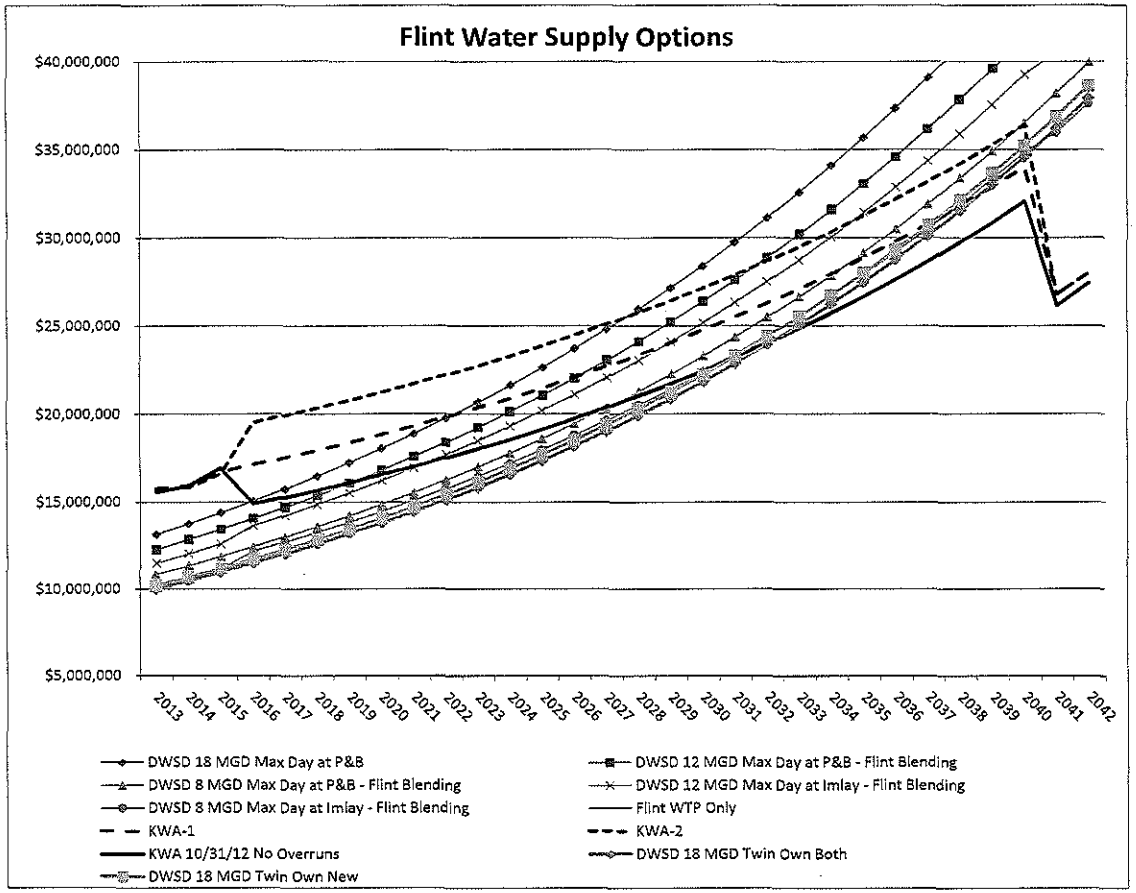
Amount:	$ -		
Reserve:	$ -	0%	Reserve Rate: 0.00%
Amount plus Reserve:	$ -		
Revenue Bond Rate:	5%		
Number of Years:	25		
Annual Cost:	$0		



	Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ -	10,188,770		-	$ 10,188,770
2	2014	$ -	10,667,642		-	$ 10,667,642
3	2015	$ -	11,169,021		-	$ 11,169,021
4	2016	$ -	11,693,965	-	-	$ 11,693,965
5	2017	$ -	12,243,582	-	-	$ 12,243,582
6	2018	$ -	12,819,030	-	-	$ 12,819,030
7	2019	$ -	13,421,525	-	-	$ 13,421,525
8	2020	$ -	14,052,336	-	-	$ 14,052,336
9	2021	$ -	14,712,796	-	-	$ 14,712,796
10	2022	$ -	15,404,297	-	-	$ 15,404,297
11	2023	$ -	16,128,299	-	-	$ 16,128,299
12	2024	$ -	16,886,330	-	-	$ 16,886,330
13	2025	$ -	17,679,987	-	-	$ 17,679,987
14	2026	$ -	18,510,946	-	-	$ 18,510,946
15	2027	$ -	19,380,961	-	-	$ 19,380,961
16	2028	$ -	20,291,866	-	-	$ 20,291,866
17	2029	$ -	21,245,584	-	-	$ 21,245,584
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 Cummulative
$ 466,642,790

30 Yrs Cummulative
$ 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:

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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.

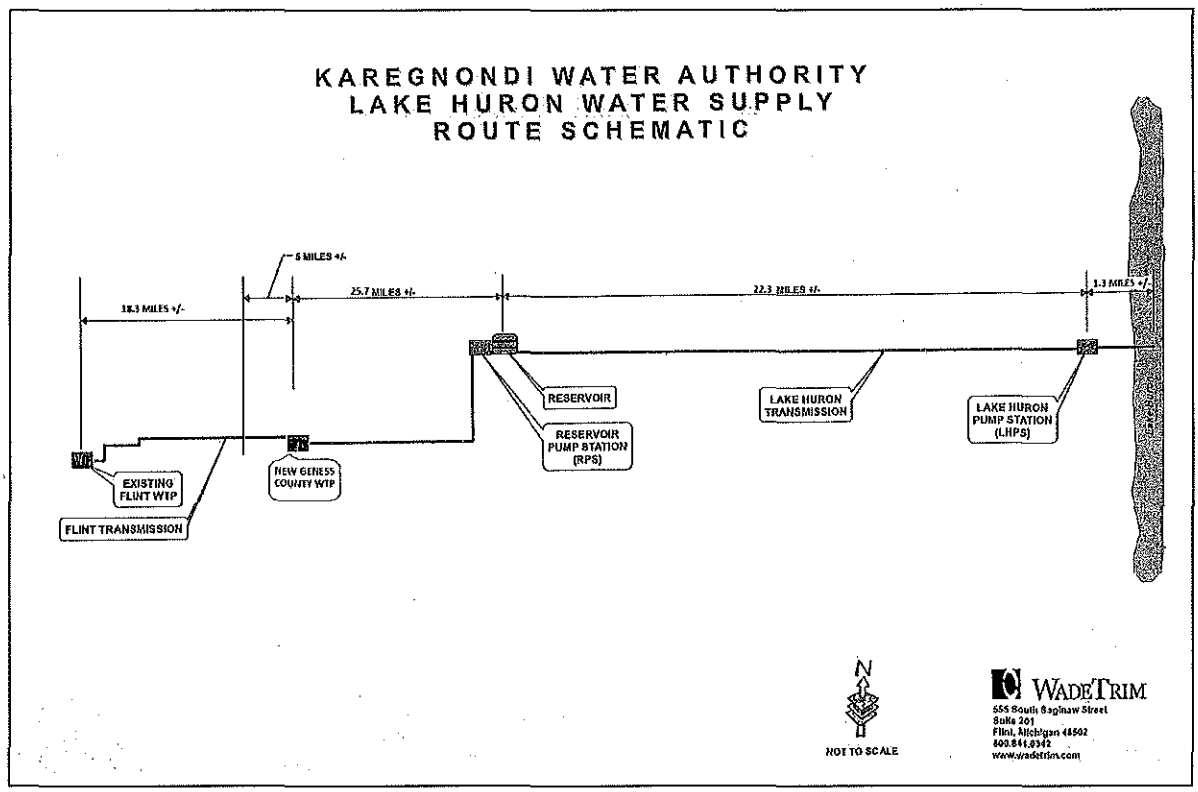


Figure 2-1: KWA Raw Water System

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.

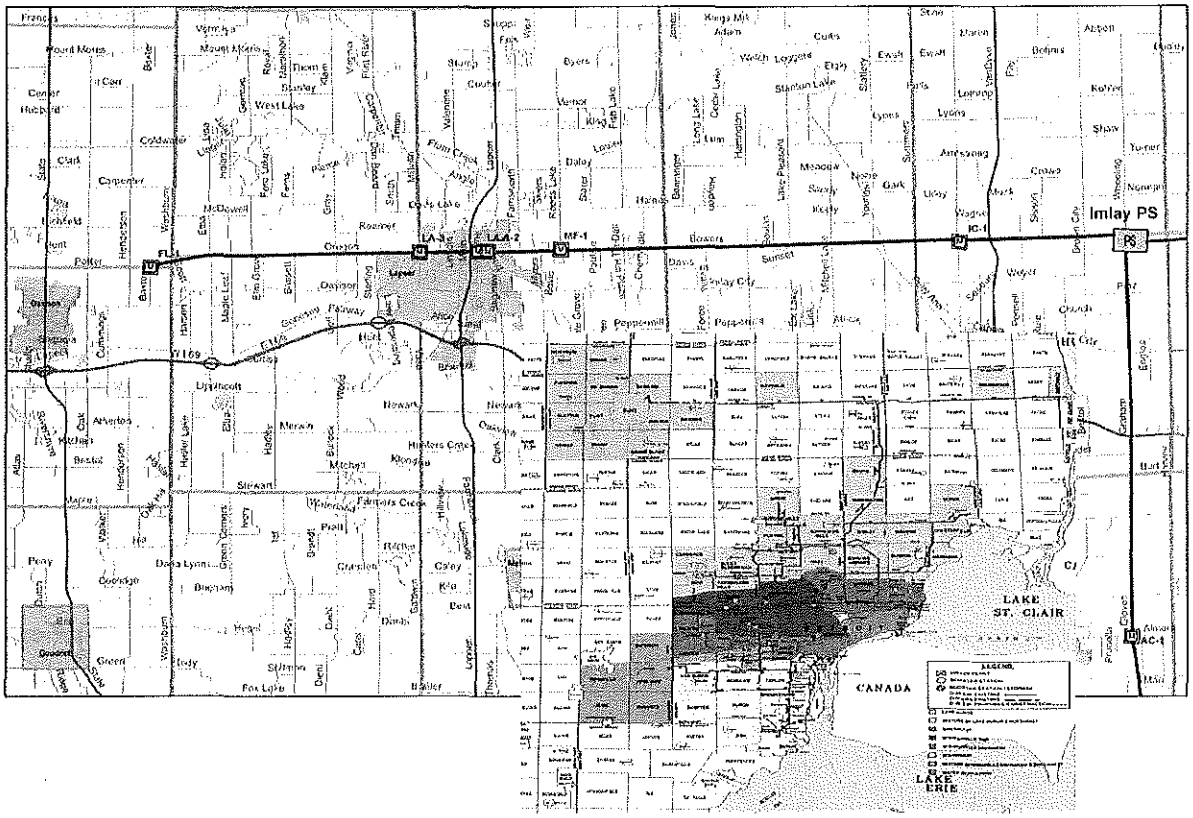


Figure 2-2: DWSD Water System

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
Total	**$29,896,063**

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	TY/T	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
Total		**$30,772,600**		**$71,042,808**

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
Total		**$207,752,895**		**$218,811,559**

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
Total	**$32,554,630**

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
Total	**$ 272,421,558**	**$ 357,578,060**
Flint Share at 30%	**$81,726,467**	**$107,273,418**

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 the 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.

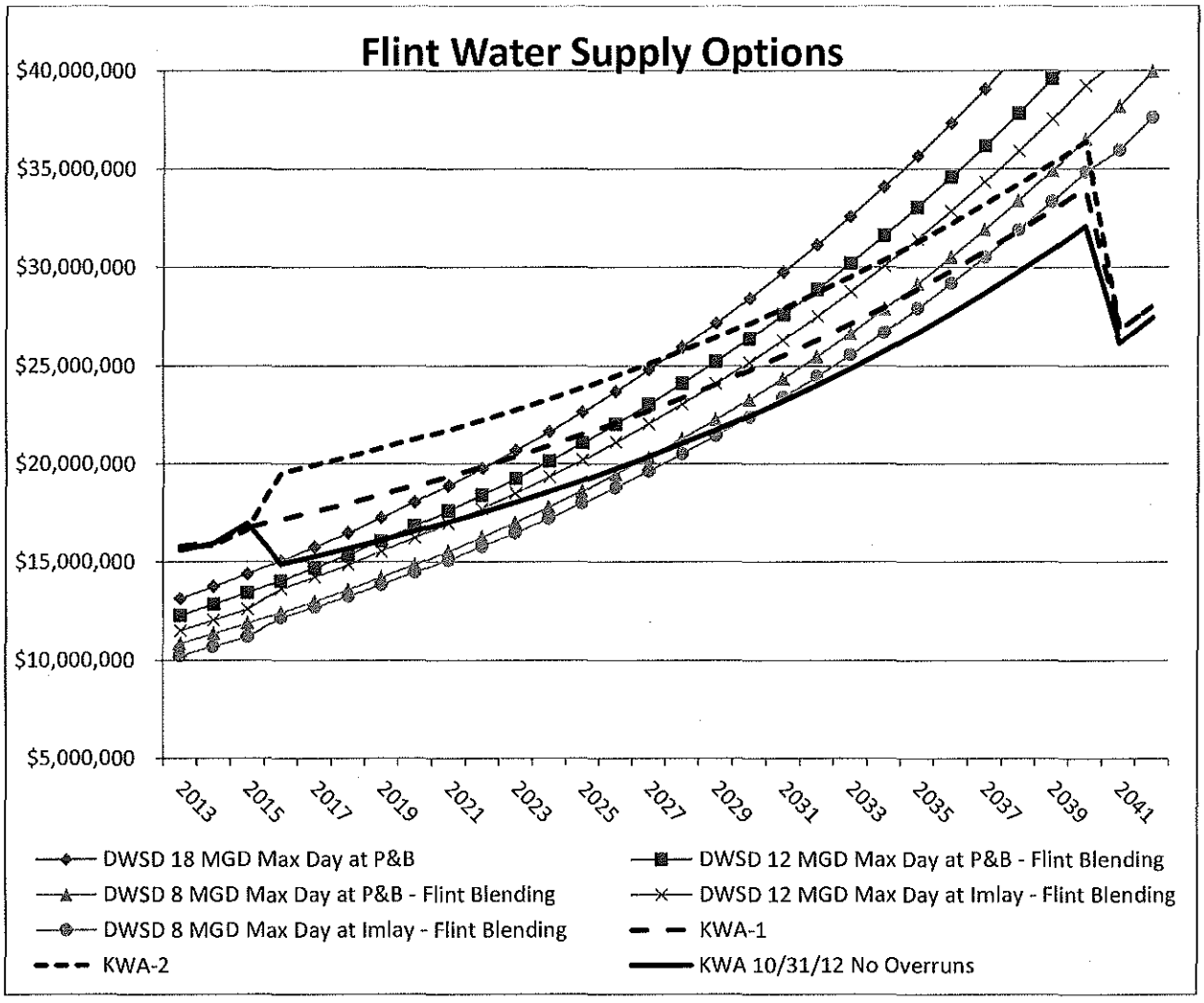


Figure 6-1: Flint Water Supply Options through 2042

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

TUCKER, YOUNG,
JACKSON, TULL INC.
CONSULTING ENGINEERS-PLANNERS
565 E. Larned Suite 300
Detroit, Michigan 48226
(313)963-0612 FAX (313)963-2156

MEETING MINUTES

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.

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

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).

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.

TUCKER, YOUNG,
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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?

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.

Summary of DWSD Cost Allocations to Flint Under Various Scenarios

Flint Only

	Revenue Requirement	Rates and Charges		
		Fixed	Commodity	Avg Unit Cost
1 **Status Quo**	11,461,700	357,271	12.46	19.91
2 **Model Contract**	9,732,100	275,517	11.16	16.90
3 Change	(1,729,600)	(81,754)	(1.30)	(3.00)
4 % Change	*-15.1%*	*-22.9%*	*-10.4%*	*-15.1%*
5 **Max Day Only**	9,424,700	271,010	10.72	16.37
6 Change	(307,400)	(4,507)	(0.44)	(0.53)
7 % Change	*-3.3%*	*-1.7%*	*-4.1%*	*-3.3%*
8 **Allow Blending**	6,302,800	182,369	10.72	16.42
9 Change	(3,121,900)	(88,641)	0.00	0.05
10 % Change	*-49.5%*	*-48.6%*	*0.0%*	*0.3%*
11 **Imlay City Connections**	5,800,700	170,912	9.77	15.11
12 Change	(502,100)	(11,457)	(0.95)	(1.31)
13 % Change	*-8.7%*	*-6.7%*	*-9.7%*	*-8.7%*
14 Cumulative Change	(5,661,000)	(186,359)	(2.69)	(4.80)
15 Cumulative %Change	*-49.4%*	*-52.2%*	*-21.6%*	*-24.1%*

	Assumptions					
	Avg Day	Max Day	Peak Hour	Distance	Elevation	Sales
	mgd	*mgd*	*mgd*	*miles*	*feet*	*mgd*
1 **Status Quo**	11.8	21.6	22.6	52.0	866	**11.8**
2 **Model Contract**	11.8	**17.9**	**18.8**	52.0	866	11.8
3 **Max Day Only**	11.8	17.9	**17.9**	52.0	866	11.8
4 **Allow Blending**	7.9	**11.9**	**11.9**	52.0	866	7.9
5 **Imlay City Connections**	7.9	11.9	11.9	**45.2**	**866**	7.9

Recent DWSD Water Rates to Flint

FY	Rates and Charges: Fixed $/mo	Rates and Charges: Commodity $/Mcf	Rates and Charges: Avg Unit Cost $/Mcf	Annual Change: Fixed $/mo	Annual Change: Commodity $/Mcf	Annual Change: Avg Unit Cost $/Mcf	*Average Annual Change*
As Charged							
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%**
Hypothetical Model Contract							
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%**

Recent DWSD Water Rates to Flint

FY	Rates and Charges			Annual Change			*Average*
	Fixed	Commodity	Avg Unit Cost	Fixed	Commodity	Avg Unit Cost	*Annual Change*
	$/mo	*$/Mcf*	*$/Mcf*	*$/mo*	*$/Mcf*	*$/Mcf*	
As Charged							
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%**
*Hypothetical Model Contract - **Flint Only***							
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%**

Recent DWSD Water Rates to Flint

	Rates and Charges			Annual Change			*Average*
FY	Fixed	Commodity	Avg Unit Cost	Fixed	Commodity	Avg Unit Cost	*Annual Change*
	$/mo	*$/Mcf*	*$/Mcf*	*$/mo*	*$/Mcf*	*$/Mcf*	
As Charged							
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%**
*Hypothetical Model Contract - **Flint Only @ Imlay***							
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%**

TUCKER, YOUNG,
JACKSON, TULL INC.
CONSULTING ENGINEERS-PLANNERS
565 E. Larned Suite 300
Detroit, Michigan 48226
(313)963-0612 FAX (313)963-2156

MEETING MINUTES

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 Qaqish, 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.

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

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.

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.

Action Items for Follow-up		
Items:	***Assigned To:***	***Date to Complete***
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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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.).
8. KWA's initial charge to Flint is based on a 12 MGD maximum 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?
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.

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.

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?
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.

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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

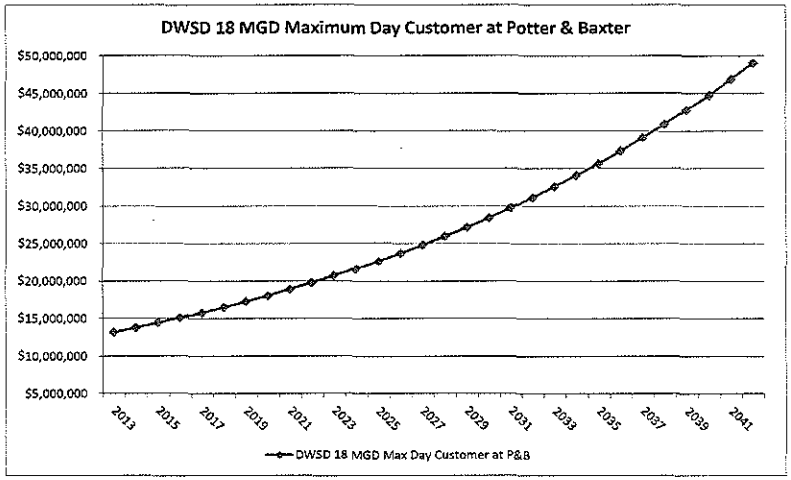
DWSD Worksheet : 18 MGD Maximum Day Customer with Model Contract at Potter & Baxter

Capacity					
Flint ADD:	0.60	MGD	81	MCF/Day	
DWSD ADD:	12	MGD	1,604	MCF/Day	
Annual Volume					
Flint:	29,412	MCF			
DWSD:	585,561	MCF			
2013 Cost of Supply					
Flint WTP O&M:	120.30	/MCF	$ 3,538,214	/Yr	
DWSD:	$ 16.37	/MCF	$ 9,585,642	/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	$ 3,538,214	9,585,642		-	$ 13,123,856
2	2014	$ 3,697,788	10,036,167		-	$ 13,733,955
3	2015	$ 3,864,558	10,507,867		-	$ 14,372,425
4	2016	$ 4,038,850	11,001,736	-	-	$ 15,040,586
5	2017	$ 4,221,002	11,518,818	-	-	$ 15,739,820
6	2018	$ 4,411,369	12,060,203	-	-	$ 16,471,571
7	2019	$ 4,610,322	12,627,032	-	-	$ 17,237,354
8	2020	$ 4,818,247	13,220,503	-	-	$ 18,038,750
9	2021	$ 5,035,550	13,841,866	-	-	$ 18,877,416
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
13	2025	$ 6,007,286	16,633,413	-	-	$ 22,640,699
14	2026	$ 6,278,215	17,415,183	-	-	$ 23,693,398
15	2027	$ 6,561,362	18,233,697	-	-	$ 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
18	2030	$ 7,489,754	20,927,376	-	-	$ 28,417,130
19	2031	$ 7,827,542	21,910,963	-	-	$ 29,738,505
20	2032	$ 8,180,564	22,940,778	-	-	$ 31,121,342
21	2033	$ 8,549,507	24,018,995	-	-	$ 32,568,502
22	2034	$ 8,935,090	25,147,887	-	-	$ 34,082,977
23	2035	$ 9,338,063	26,329,838	-	-	$ 35,667,901
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				

25 Yrs Cummulative	
$	596,916,044

30 Yrs Cummulative	
$	821,226,268

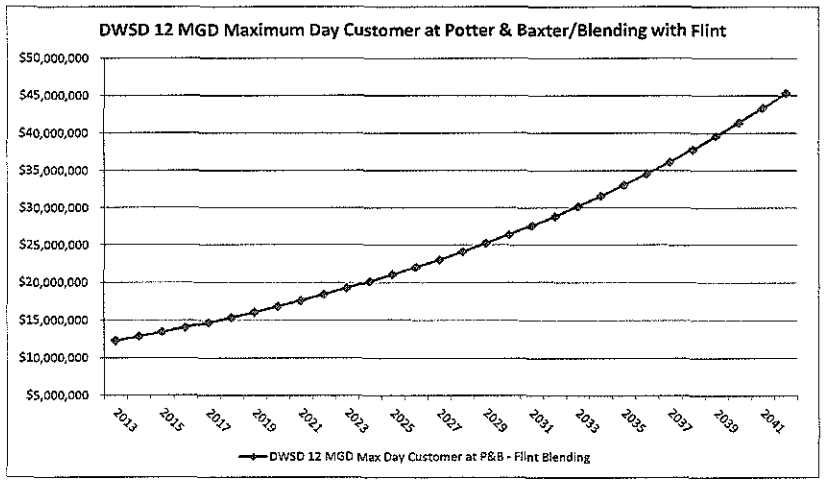


DWSD Worksheet : 12 MGD Maximum Day Customer with Model Contract at Potter & Baxter/Blending with Flint

Capacity								Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
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
Annual Volume						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
					5895097.471	7	2019	$ 7,681,359	8,387,167	-	-	$ 16,068,527
2013 Cost of Supply						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
						11	2023	$ 9,163,671	10,078,642	-	-	$ 19,242,313
						12	2024	$ 9,576,952	10,552,338	-	-	$ 20,129,291
Escalation/Inflation Rate						13	2025	$ 10,008,873	11,048,298	-	-	$ 21,057,171
Flint:	4.51%	/Yr				14	2026	$ 10,460,273	11,567,568	-	-	$ 22,027,841
DWSD:	4.7%	/Yr				15	2027	$ 10,932,031	12,111,244	-	-	$ 23,043,275
						16	2028	$ 11,425,066	12,680,473	-	-	$ 24,105,538
						17	2029	$ 11,940,336	13,276,455	-	-	$ 25,216,791
Capital Expenditure						18	2030	$ 12,478,845	13,900,448	-	-	$ 26,379,294
Amount:	$ -					19	2031	$ 13,041,641	14,553,769	-	-	$ 27,595,410
Reserve:	$ -	0%	Reserve Rate:	0.00%		20	2032	$ 13,629,819	15,237,796	-	-	$ 28,867,616
Amount plus Reserve:	$ -					21	2033	$ 14,244,524	15,953,973	-	-	$ 30,198,497
Revenue Bond Rate:	5%					22	2034	$ 14,886,952	16,703,810	-	-	$ 31,590,762
Number of Years:	25					23	2035	$ 15,558,354	17,488,889	-	-	$ 33,047,242
Annual Cost:	$0					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	20,072,537	-	-	$ 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 Cummulative	
$	554,681,686

30 Yrs Cummulative	
$	762,110,308



DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Potter & Baxter/Blending with Flint

Capacity

Flint ADD:	4	MGD	535 MCF/Day
DWSD ADD:	8	MGD	1,070 MCF/Day

Annual Volume

Flint:	195,187 MCF
DWSD:	390,374 MCF

2013 Cost of Supply

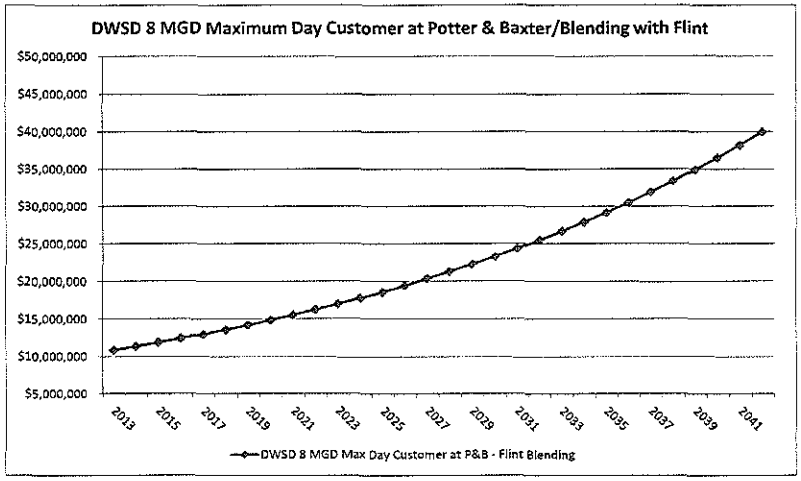
Flint WTP O&M:	$ 30.20	/MCF	$ 5,895,097	/Yr
DWSD:	$ 12.68	/MCF	$ 4,949,947	/Yr

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	$ 5,895,097	4,949,947		-	$ 10,845,044
2	2014	$ 6,160,966	5,182,594		-	$ 11,343,560
3	2015	$ 6,438,826	5,426,176		-	$ 11,865,002
4	2016	$ 6,729,217	5,681,206	-	-	$ 12,410,423
5	2017	$ 7,032,705	5,948,223	-	-	$ 12,980,928
6	2018	$ 7,349,880	6,227,789	-	-	$ 13,577,669
7	2019	$ 7,681,359	6,520,495	-	-	$ 14,201,855
8	2020	$ 8,027,789	6,826,959	-	-	$ 14,854,747
9	2021	$ 8,389,842	7,147,826	-	-	$ 15,537,668
10	2022	$ 8,768,224	7,483,774	-	-	$ 16,251,997
11	2023	$ 9,163,671	7,835,511	-	-	$ 16,999,182
12	2024	$ 9,576,952	8,203,780	-	-	$ 17,780,732
13	2025	$ 10,008,873	8,589,358	-	-	$ 18,598,230
14	2026	$ 10,460,273	8,993,057	-	-	$ 19,453,330
15	2027	$ 10,932,031	9,415,731	-	-	$ 20,347,762
16	2028	$ 11,425,066	9,858,271	-	-	$ 21,283,336
17	2029	$ 11,940,336	10,321,609	-	-	$ 22,261,945
18	2030	$ 12,478,845	10,806,725	-	-	$ 23,285,570
19	2031	$ 13,041,641	11,314,641	-	-	$ 24,356,282
20	2032	$ 13,629,819	11,846,429	-	-	$ 25,476,248
21	2033	$ 14,244,524	12,403,211	-	-	$ 26,647,735
22	2034	$ 14,886,952	12,986,162	-	-	$ 27,873,114
23	2035	$ 15,558,354	13,596,512	-	-	$ 29,154,866
24	2036	$ 16,260,035	14,235,548	-	-	$ 30,495,583
25	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 Cummulative	
$	489,780,792

30 Yrs Cummulative	
$	672,671,705

DWSD Worksheet : 12 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

Capacity

Flint ADD:	4	MGD	535	MCF/Day
DWSD ADD:	8	MGD	1,070	MCF/Day

Annual Volume

Flint:	195,187	MCF
DWSD:	390,374	MCF

2013 Cost of Supply

Flint WTP O&M:	$ 30.20	/MCF	$ 5,895,097	/Yr
DWSD:	$ 14.38	/MCF	$ 5,613,583	/Yr

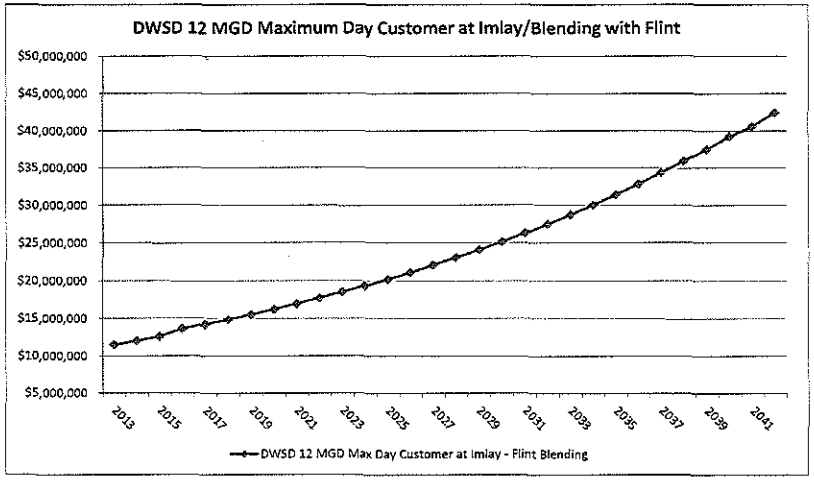
Escalation/Inflation Rate

Flint:	4.51% /Yr
DWSD:	4.7% /Yr

Capital Expenditure

Capital:	$ 4,700,000		
Bond Issuance (3% of Total):	195,000	Check:	3.0%
3 Years of Capitalized Interest:	975,000	Check:	5.0% /Yr (Bond Interest on Total)
Reserve (10% of Total):	650,000	Check:	10.0%
Total:	$ 6,520,000		

Revenue Bond Rate:	5%
Number of Years:	25
Annual Cost:	$462,610
Interest on Reserve:	3%



	Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ 5,895,097	5,613,583		19,500	$ 11,489,180
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
4	2016	$ 6,729,217	6,442,882	462,610	19,500	$ 13,615,209
5	2017	$ 7,032,705	6,745,698	462,610	19,500	$ 14,221,512
6	2018	$ 7,349,880	7,062,745	462,610	19,500	$ 14,855,735
7	2019	$ 7,681,359	7,394,694	462,610	19,500	$ 15,519,164
8	2020	$ 8,027,789	7,742,245	462,610	19,500	$ 16,213,144
9	2021	$ 8,389,842	8,106,131	462,610	19,500	$ 16,939,082
10	2022	$ 8,768,224	8,487,119	462,610	19,500	$ 17,698,452
11	2023	$ 9,163,671	8,886,013	462,610	19,500	$ 18,492,794
12	2024	$ 9,576,952	9,303,656	462,610	19,500	$ 19,323,718
13	2025	$ 10,008,873	9,740,928	462,610	19,500	$ 20,192,910
14	2026	$ 10,460,273	10,198,751	462,610	19,500	$ 21,102,134
15	2027	$ 10,932,031	10,678,093	462,610	19,500	$ 22,053,234
16	2028	$ 11,425,066	11,179,963	462,610	19,500	$ 23,048,139
17	2029	$ 11,940,336	11,705,421	462,610	19,500	$ 24,088,867
18	2030	$ 12,478,845	12,255,576	462,610	19,500	$ 25,177,531
19	2031	$ 13,041,641	12,831,588	462,610	19,500	$ 26,316,339
20	2032	$ 13,629,819	13,434,673	462,610	19,500	$ 27,507,602
21	2033	$ 14,244,524	14,066,102	462,610	19,500	$ 28,753,736
22	2034	$ 14,886,952	14,727,209	462,610	19,500	$ 30,057,271
23	2035	$ 15,558,354	15,419,388	462,610	19,500	$ 31,420,852
24	2036	$ 16,260,035	16,144,099	462,610	19,500	$ 32,847,245
25	2037	$ 16,993,363	16,902,872	462,610	19,500	$ 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 Cummulative	
$	529,865,071

30 Yrs Cummulative	
$	725,576,803

DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

Capacity

Flint ADD:	4	MGD	535	MCF/Day
DWSD ADD:	8	MGD	1,070	MCF/Day

Annual Volume

Flint:	195,187	MCF
DWSD:	390,374	MCF

2013 Cost of Supply

Flint WTP O&M:	$ 30.20	/MCF	$ 5,895,097	/Yr
DWSD:	$ 11.11	/MCF	$ 4,337,059	/Yr

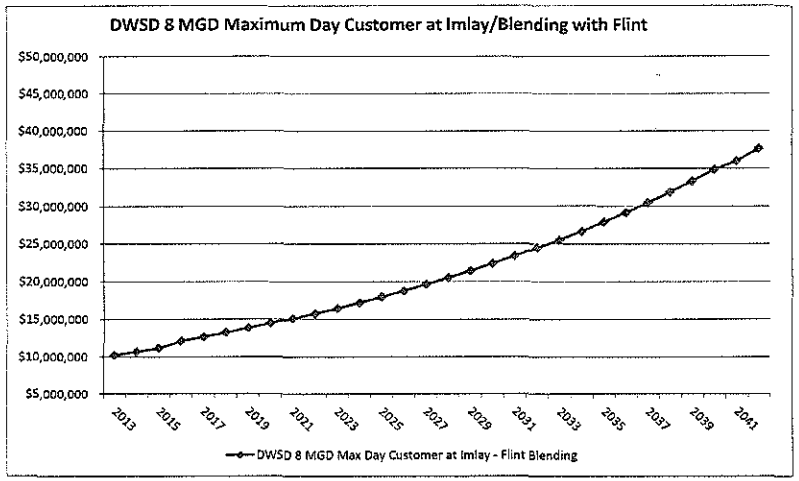
Escalation/Inflation Rate

Flint:	4.51% /Yr
DWSD:	4.7% /Yr

Capital Expenditure

Capital:	$ 4,700,000		
Bond Issuance (3% of Total):	195,000	Check:	3.0%
3 Years of Capitalized Interest:	975,000	Check:	5.0% /Yr (Bond Interest on Total)
Reserve (10% of Total):	650,000	Check:	10.0%
Total:	$ 6,520,000		

Revenue Bond Rate:	5%
Number of Years:	25
Annual Cost:	$462,610
Interest on Reserve:	3%



	Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ 5,895,097	4,337,059		19,500	$ 10,212,656
2	2014	$ 6,160,966	4,540,901		19,500	$ 10,682,367
3	2015	$ 6,438,826	4,754,323		19,500	$ 11,173,649
4	2016	$ 6,729,217	4,977,776	462,610	19,500	$ 12,150,103
5	2017	$ 7,032,705	5,211,732	462,610	19,500	$ 12,687,546
6	2018	$ 7,349,880	5,456,683	462,610	19,500	$ 13,249,673
7	2019	$ 7,681,359	5,713,147	462,610	19,500	$ 13,837,616
8	2020	$ 8,027,789	5,981,665	462,610	19,500	$ 14,452,564
9	2021	$ 8,389,842	6,262,803	462,610	19,500	$ 15,095,755
10	2022	$ 8,768,224	6,557,155	462,610	19,500	$ 15,768,489
11	2023	$ 9,163,671	6,865,341	462,610	19,500	$ 16,472,122
12	2024	$ 9,576,952	7,188,012	462,610	19,500	$ 17,208,074
13	2025	$ 10,008,873	7,525,849	462,610	19,500	$ 17,977,832
14	2026	$ 10,460,273	7,879,564	462,610	19,500	$ 18,782,947
15	2027	$ 10,932,031	8,249,903	462,610	19,500	$ 19,625,044
16	2028	$ 11,425,066	8,637,649	462,610	19,500	$ 20,505,824
17	2029	$ 11,940,336	9,043,618	462,610	19,500	$ 21,427,064
18	2030	$ 12,478,845	9,468,668	462,610	19,500	$ 22,390,624
19	2031	$ 13,041,641	9,913,696	462,610	19,500	$ 23,398,447
20	2032	$ 13,629,819	10,379,639	462,610	19,500	$ 24,452,569
21	2033	$ 14,244,524	10,867,482	462,610	19,500	$ 25,555,117
22	2034	$ 14,886,952	11,378,254	462,610	19,500	$ 26,708,315
23	2035	$ 15,558,354	11,913,032	462,610	19,500	$ 27,914,496
24	2036	$ 16,260,035	12,472,945	462,610	19,500	$ 29,176,090
25	2037	$ 16,993,363	13,059,173	462,610	19,500	$ 30,495,646
	2038	$ 17,759,764	13,672,954	462,610	19,500	$ 31,875,828
	2039	$ 18,560,729	14,315,583	462,610	19,500	$ 33,319,422
	2040	$ 19,397,818	14,988,415	462,610	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

25 Yrs Cummulative	
$	493,063,801

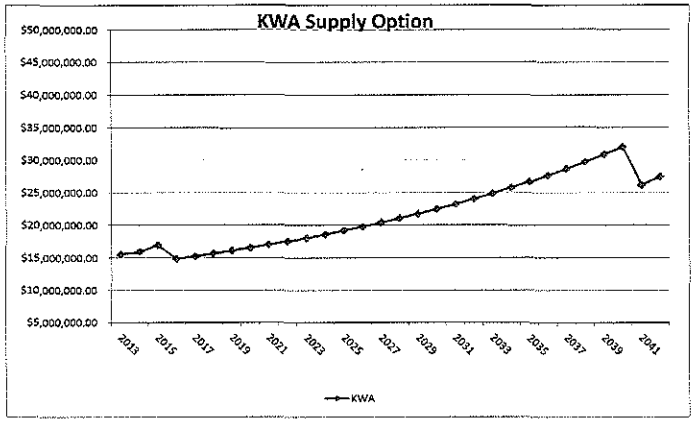
30 Yrs Cummulative	
$	634,795,488

KWA Supply Option Worksheet
KWA 10/31/12 No Overruns

	Year	DWSD & Flint WTP Costs	KWA Entry Fee	KWA Debt service	Flint WTP Debt Service	KWA Operations	Flint WTP Operations 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	6,843,344	$ 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	8,734,084	$ 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 Cummulative	
$	503,456,186

30 Yrs Cummulative	
$	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	$ 7,913,118	/Yr
KWA: $	1.50	/MCF	$ 878,869	/Yr
Escalation/Inflation Rate				
Flint:	4.51%	/Yr		
KWA:	5.0%	/Yr		

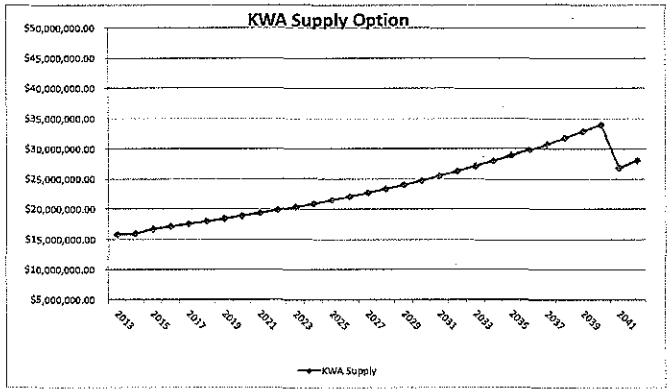
Capital Expenditure

David Guastella: Assumes Bond Issuance and Reserves are not included

Capital: $	272,421,558			
Bond Issuance (2.25% of Total):	6,440,000	Check:	2.25%	
3 Years of Capitalized Interest:	56,000,000	Check:	5.0%	/Yr (Bond Interest on Total)
Reserve (10% of Total):	37,500,000	Check:	10.0%	
Total: $	374,361,558			
Flint's Share (30%) $	112,308,467			
Revenue Bond Rate:	5%			
Number of Years:	25			
Annual Cost:	$7,968,562			
Interest on Reserve:	3%			

David Guastella: Increased by 3%/Yr to 2012 $'s

Capital: $	7,758,362			
Bond Issuance (3% of Total):	240,000	Check:	2.25%	
3 Years of Capitalized Interest:	1,600,000	Check:	5.0%	/Yr (Bond Interest on Total)
Reserve (10% of Total):	1,070,000	Check:	10.0%	
Total: $	10,668,362			
Revenue Bond Rate:	5%			
Number of Years:	25			
Annual Cost:	$756,946			
Interest on Reserve:	3%			



David Guastella: Flint buys water from DWSD for three years during KWA construction at current rate (assume 5% increase each year)

David Guastella: Highlighted portion is Flint's Entry Fee to KWA

	Year	Flint WTP O&M	Water Purchase	KWA Revenue Pre-bond Entry Fee & Bond Payment	Flint Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ 3,538,214	11,461,700	1,162,800		369,600	$ 15,793,114
2	2014	$ 3,697,788	12,034,785	581,400		369,600	$ 15,944,373
3	2015	$ 3,864,552	12,636,524	581,400		369,600	$ 16,712,882
4	2016	$ 7,913,118	878,869	7,968,562	756,946	369,600	$ 17,147,896
5	2017	$ 8,270,000	922,812	7,968,562	756,946	369,600	$ 17,548,721
6	2018	$ 8,642,977	968,953	7,968,562	756,946	369,600	$ 17,967,838
7	2019	$ 9,032,775	1,017,401	7,968,562	756,946	369,600	$ 18,405,084
8	2020	$ 9,440,153	1,068,271	7,968,562	756,946	369,600	$ 18,864,332
9	2021	$ 9,865,904	1,121,684	7,968,562	756,946	369,600	$ 19,343,497
10	2022	$ 10,310,857	1,177,769	7,968,562	756,946	369,600	$ 19,844,533
11	2023	$ 10,775,876	1,236,657	7,968,562	756,946	369,600	$ 20,358,441
12	2024	$ 11,261,868	1,298,490	7,968,562	756,946	369,600	$ 20,916,266
13	2025	$ 11,769,779	1,363,414	7,968,562	756,946	369,600	$ 21,489,101
14	2026	$ 12,300,596	1,431,585	7,968,562	756,946	369,600	$ 22,088,089
15	2027	$ 12,855,352	1,503,164	7,968,562	756,946	369,600	$ 22,714,425
16	2028	$ 13,435,129	1,578,322	7,968,562	756,946	369,600	$ 23,369,359
17	2029	$ 14,041,053	1,657,239	7,968,562	756,946	369,600	$ 24,054,200
18	2030	$ 14,674,305	1,740,101	7,968,562	756,946	369,600	$ 24,770,313
19	2031	$ 15,336,116	1,827,106	7,968,562	756,946	369,600	$ 25,519,130
20	2032	$ 16,027,775	1,918,461	7,968,562	756,946	369,600	$ 26,302,144
21	2033	$ 16,750,627	2,014,384	7,968,562	756,946	369,600	$ 27,120,919
22	2034	$ 17,506,080	2,115,103	7,968,562	756,946	369,600	$ 27,977,092
23	2035	$ 18,295,605	2,220,858	7,968,562	756,946	369,600	$ 28,872,371
24	2036	$ 19,120,737	2,331,901	7,968,562	756,946	369,600	$ 29,808,546
25	2037	$ 19,983,082	2,448,496	7,968,562	756,946	369,600	$ 30,787,486
	2038	$ 20,884,319	2,570,921	7,968,562	756,946	369,600	$ 31,811,148
	2039	$ 21,826,201	2,699,467	7,968,562	756,946	369,600	$ 32,881,577
	2040	$ 22,810,563	2,834,440	7,968,562	756,946	369,600	$ 34,000,912
	2041	$ 23,839,320	2,976,162				$ 26,815,482
	2042	$ 24,914,473	3,124,970				$ 28,039,443

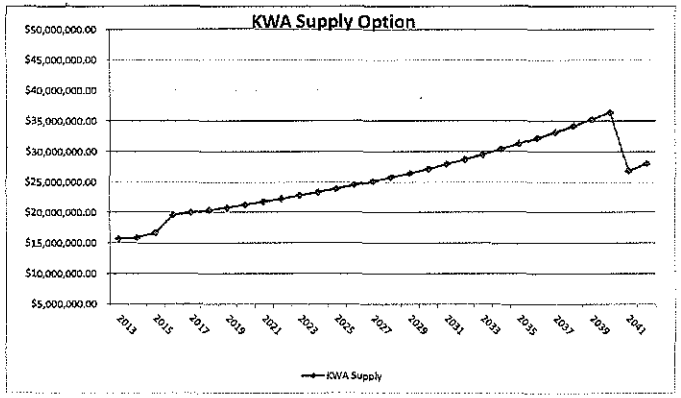
25 Yrs Cummulative
$ 553,731,153

30 Yrs Cummulative
$ 707,279,715

KWA Supply Option Worksheet
KWA-2

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	$ 7,913,118	/Yr	
KWA:	$ 1.50	/MCF	$ 878,869	/Yr	
Escalation/Inflation Rate					
Flint:	4.51%	/Yr			
KWA:	5.0%	/Yr			
Capital Expenditure					
Capital:	$ 357,578,060				
Bond Issuance (2.25% of Total):	11,050,000	Check:	2.25%		
3 Years of Capitalized Interest:	74,000,000	Check:	5.0%	/Yr (Bond Interest on Total)	
Reserve (10% of Total):	49,000,000	Check:	10.0%		
Total:	$ 491,628,060				
Flint's Share (30%)	$ 147,488,418				
Revenue Bond Rate:	5%				
Number of Years:	25				
Annual Cost:	$10,464,666				
Interest on Reserve:	3%				
Capital:	$ 7,758,362				
Bond Issuance (3% of Total):	240,000	Check:	2.25%		
3 Years of Capitalized Interest:	1,600,000	Check:	5.0%	/Yr (Bond Interest on Total)	
Reserve (10% of Total):	1,070,000	Check:	10.0%		
Total:	$ 10,668,362				
Revenue Bond Rate:	5%				
Number of Years:	25				
Annual Cost:	$756,946				
Interest on Reserve:	3%				

	Year	Flint WTP O&M	Water Purchase	KWA Revenue Pre-bond Entry Fee & Bond Payment	Flint Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	*$ 3,538,214*	*11,461,700*	1,162,800		473,100	$ 15,689,814
2	2014	*$ 3,697,788*	*12,054,785*	581,400		473,100	$ 15,840,873
3	2015	*$ 3,864,558*	*12,636,524*	581,400		473,100	$ 16,609,382
4	2016	$ 7,913,118	878,869	10,464,666	756,946	473,100	$ 19,540,500
5	2017	$ 8,270,000	922,812	10,464,666	756,946	473,100	$ 19,941,325
6	2018	$ 8,642,977	968,953	10,464,666	756,946	473,100	$ 20,360,442
7	2019	$ 9,032,775	1,017,401	10,464,666	756,946	473,100	$ 20,798,688
8	2020	$ 9,440,153	1,068,271	10,464,666	756,946	473,100	$ 21,256,936
9	2021	$ 9,865,904	1,121,684	10,464,666	756,946	473,100	$ 21,736,101
10	2022	$ 10,310,857	1,177,769	10,464,666	756,946	473,100	$ 22,237,137
11	2023	$ 10,775,876	1,236,657	10,464,666	756,946	473,100	$ 22,761,045
12	2024	$ 11,261,868	1,298,490	10,464,666	756,946	473,100	$ 23,308,870
13	2025	$ 11,769,779	1,363,414	10,464,666	756,946	473,100	$ 23,881,705
14	2026	$ 12,300,596	1,431,585	10,464,666	756,946	473,100	$ 24,480,693
15	2027	$ 12,855,352	1,503,164	10,464,666	756,946	473,100	$ 25,107,029
16	2028	$ 13,435,129	1,578,322	10,464,666	756,946	473,100	$ 25,761,963
17	2029	$ 14,041,053	1,657,239	10,464,666	756,946	473,100	$ 26,446,804
18	2030	$ 14,674,305	1,740,101	10,464,666	756,946	473,100	$ 27,162,917
19	2031	$ 15,336,116	1,827,106	10,464,666	756,946	473,100	$ 27,911,733
20	2032	$ 16,027,775	1,918,461	10,464,666	756,946	473,100	$ 28,694,748
21	2033	$ 16,750,627	2,014,384	10,464,666	756,946	473,100	$ 29,513,523
22	2034	$ 17,506,080	2,115,103	10,464,666	756,946	473,100	$ 30,369,696
23	2035	$ 18,295,605	2,220,858	10,464,666	756,946	473,100	$ 31,264,975
24	2036	$ 19,120,737	2,331,901	10,464,666	756,946	473,100	$ 32,201,150
25	2037	$ 19,983,082	2,448,496	10,464,666	756,946	473,100	$ 33,180,090
	2038	$ 20,884,319	2,570,921	10,464,666	756,946	473,100	$ 34,203,752
	2039	$ 21,826,201	2,699,467	10,464,666	756,946	473,100	$ 35,274,181
	2040	$ 22,810,563	2,834,440	10,464,666	756,946	473,100	$ 36,393,516
	2041	$ 23,839,320	2,976,162				$ 26,815,482
	2042	$ 24,914,478	3,124,970				$ 28,039,443



25 Yrs Cummulative	
$	606,057,940

30 Yrs Cummulative	
$	766,784,313

002779

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)

From: Shekter Smith, Liane (DEQ)
Sent: Friday, March 22, 2013 8:41 AM
To: Donaldson, Kristina (DEQ); Prysby, Mike (DEQ)
Cc: Bloemker, Jon (DEQ); Benzie, Richard (DEQ); Busch, Stephen (DEQ); Butler, Sonya (DEQ); Willard, Veronica (DEQ)
Subject: FW: Flint Scenarios
Attachments: Flint Scenarios FY 2013-14.pdf; Recent DWSD Flint Supply Cost Options.pdf; TYJT Recommendaton DWSD vs Flint.pdf; flint water supply assessment final report 2-6-13.pdf

Importance: High

Kris and Mike –

Note the assignment below, due next Wednesday morning at the latest.

I'll need a point person to coordinate this. Any volunteers – Steve? Richard?

Sonya – I cc'd you as an FYI (thought you'd find the assessment interesting).

Liane J. Shekter Smith, P.E., Chief
Office of Drinking Water and Municipal Assistance
Michigan Department of Environmental Quality
517-373-9523

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 ple3ase 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 reivew and coordinate this with with Liane Shekter Smith and/or Bill Creal and their appropirate 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.

Mlary 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 *(Flint Portion)***	12,574,900	379,304	13.01	*20.39*
2	**Suggested Cct *(Flint Portion)***	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			DWSD Investment	
		Avg Day *mgd*	Max Day *mgd*	Peak Hour *mgd*	CTA *$*	Flint Only *$*
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)

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

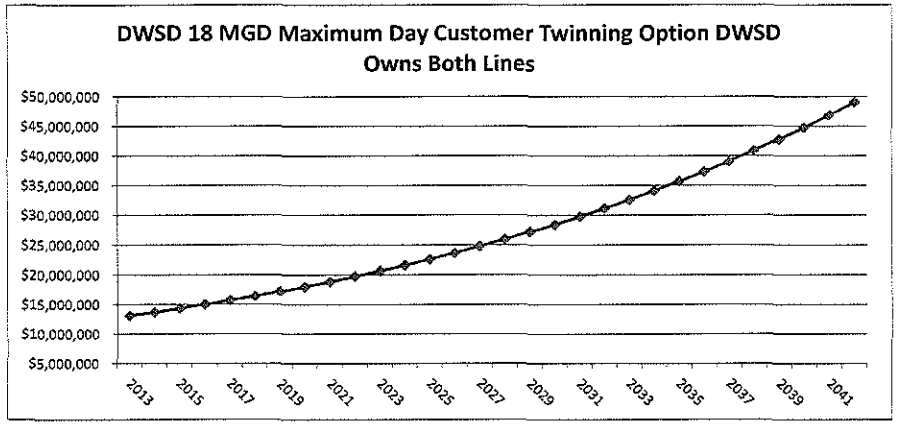
Flint WTP O&M:	-	/MCF	$ -	/Yr
DWSD:	$ 17.08	/MCF	$ 10,001,390	/Yr

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 Cummulative
$ 458,060,853

30 Yrs Cummulative
$ 631,244,349

DWSD Worksheet : 18 MGD Maximum Day Customer with Model Contract Twinning Line and Owning Only New Line 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

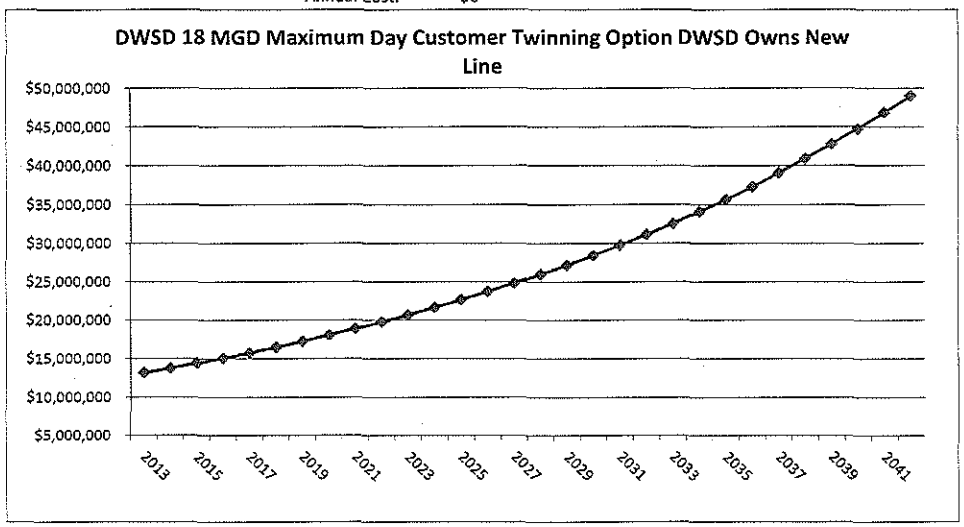
Flint WTP O&M:	-	/MCF	$ -	/Yr
DWSD:	$ 17.40	/MCF	$ 10,188,770	/Yr

Escalation/Inflation Rate

Flint:	4.51% /Yr
DWSD:	4.7% /Yr

Capital Expenditure

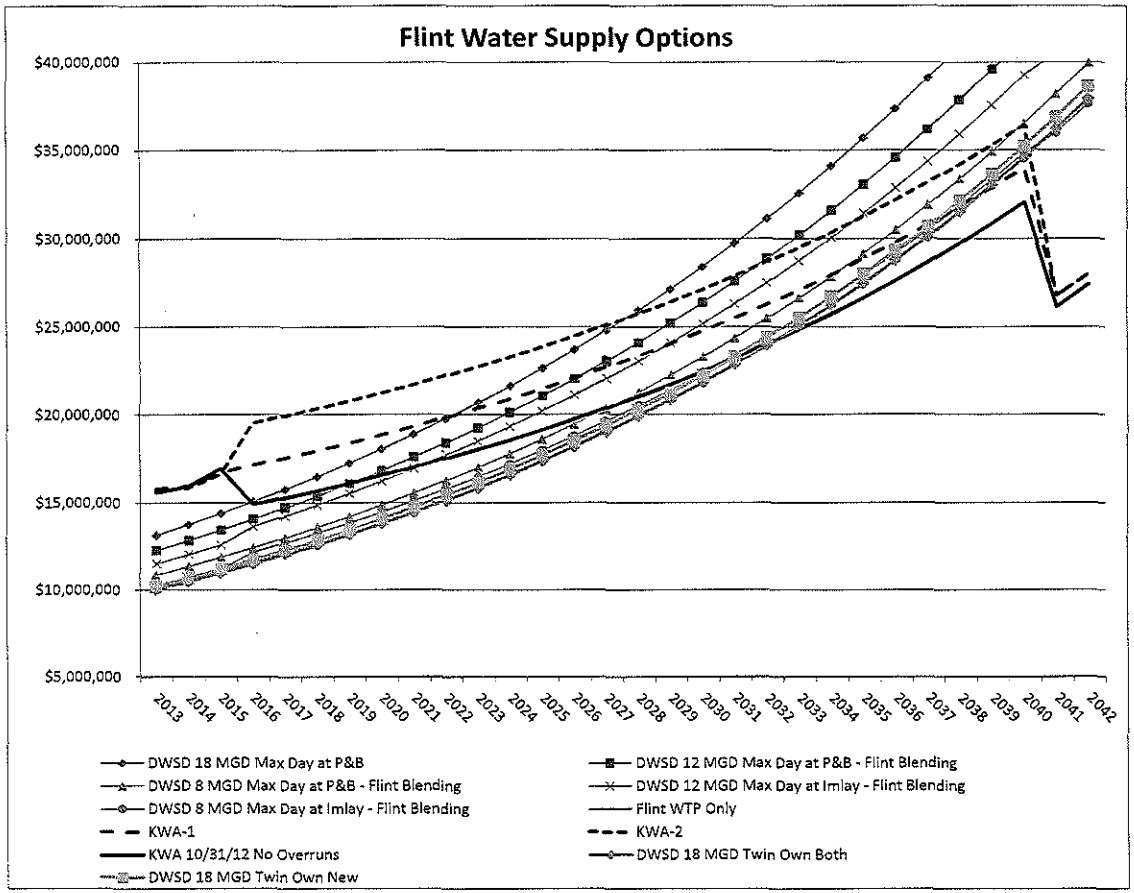
Amount:	$ -		
Reserve:	$ -	0%	Reserve Rate: 0.00%
Amount plus Reserve:	$ -		
Revenue Bond Rate:	5%		
Number of Years:	25		
Annual Cost:	$0		



	Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ -	10,188,770		-	$ 10,188,770
2	2014	$ -	10,667,642		-	$ 10,667,642
3	2015	$ -	11,169,021		-	$ 11,169,021
4	2016	$ -	11,693,965	-	-	$ 11,693,965
5	2017	$ -	12,243,582	-	-	$ 12,243,582
6	2018	$ -	12,819,030	-	-	$ 12,819,030
7	2019	$ -	13,421,525	-	-	$ 13,421,525
8	2020	$ -	14,052,336	-	-	$ 14,052,336
9	2021	$ -	14,712,796	-	-	$ 14,712,796
10	2022	$ -	15,404,297	-	-	$ 15,404,297
11	2023	$ -	16,128,299	-	-	$ 16,128,299
12	2024	$ -	16,886,330	-	-	$ 16,886,330
13	2025	$ -	17,679,987	-	-	$ 17,679,987
14	2026	$ -	18,510,946	-	-	$ 18,510,946
15	2027	$ -	19,380,961	-	-	$ 19,380,961
16	2028	$ -	20,291,866	-	-	$ 20,291,866
17	2029	$ -	21,245,584	-	-	$ 21,245,584
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 Cummulative
$ 466,642,790

30 Yrs Cummulative
$ 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:

TUCKER, YOUNG,
JACKSON, TULL INC.
CONSULTING ENGINEERS-PLANNERS
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Detroit, Michigan 48226
(313)963-0612 FAX (313)963-2156

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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.

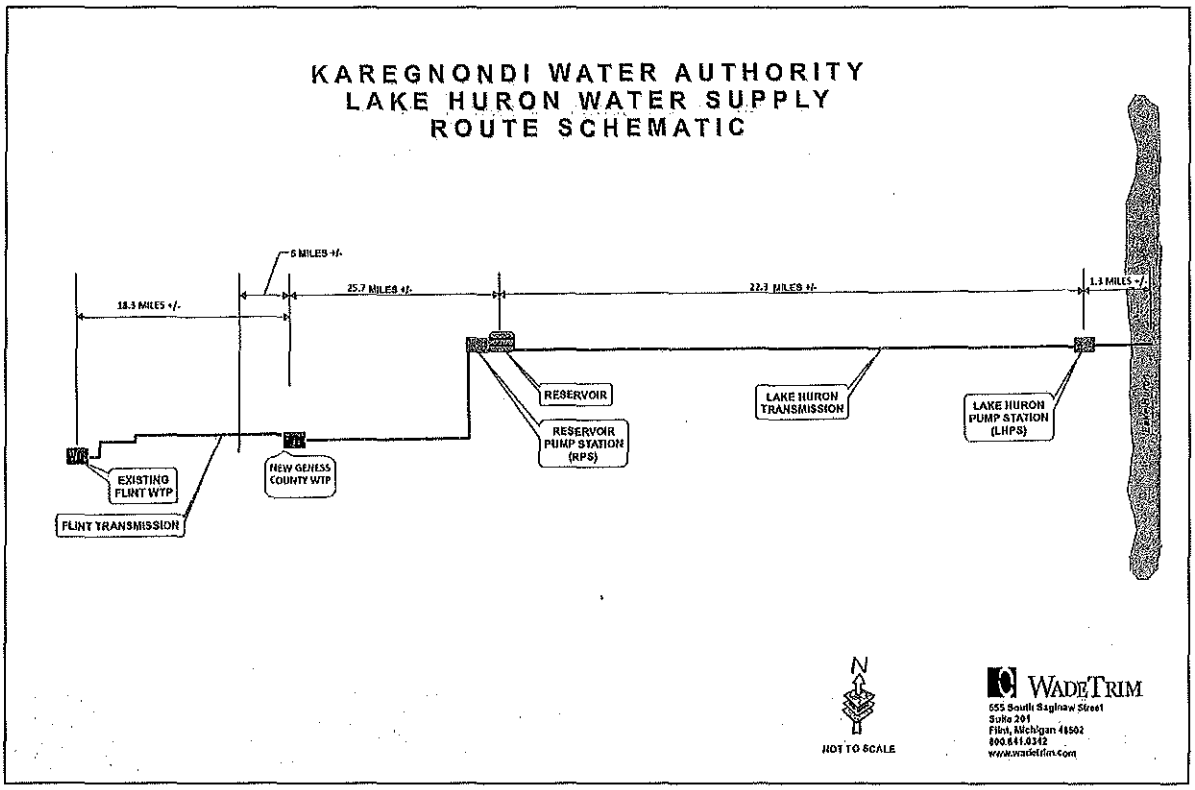


Figure 2-1: KWA Raw Water System

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.

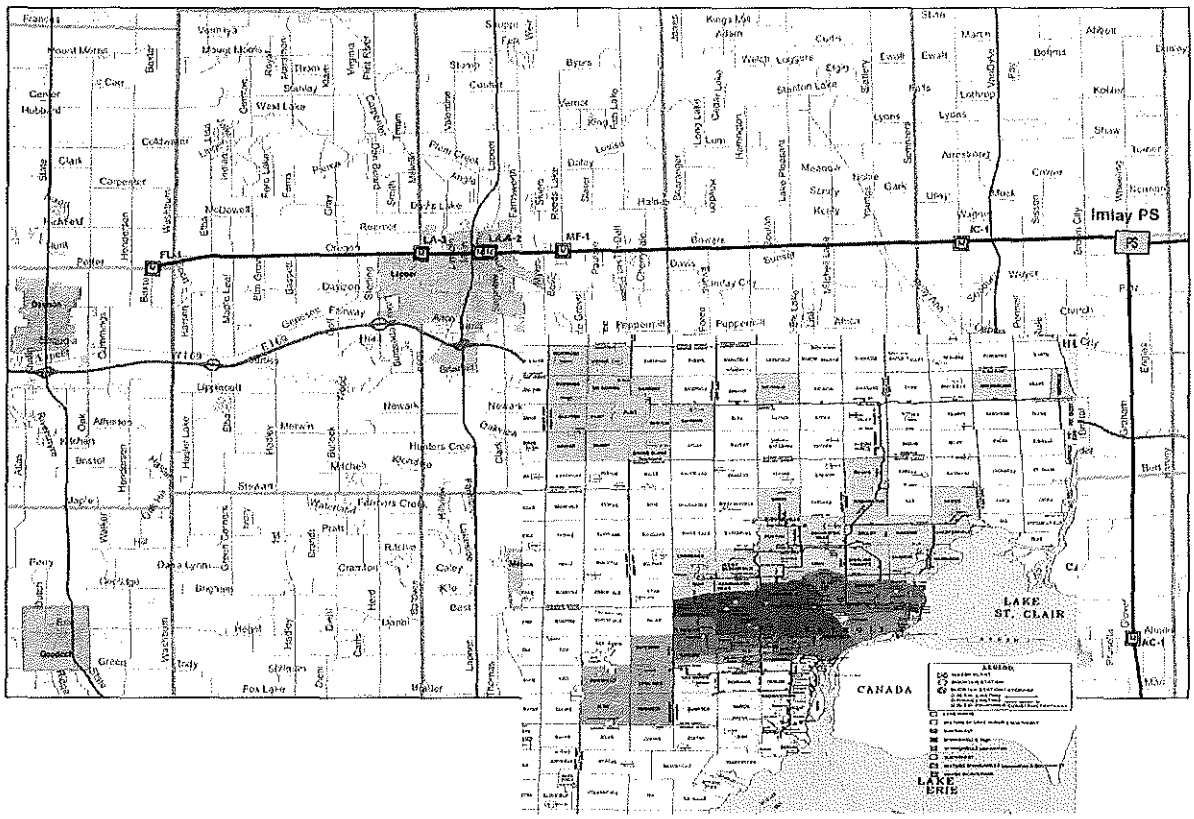


Figure 2-2: DWSD Water System

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
Total	**$29,896,063**

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	TYJT	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
Total		**$30,772,600**		**$71,042,808**

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
Total		**$207,752,895**		**$218,811,559**

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
Total	**$32,554,630**

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	TY|T 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
Total	**$ 272,421,558**	**$ 357,578,060**
Flint Share at 30%	**$81,726,467**	**$107,273,418**

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 the 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.

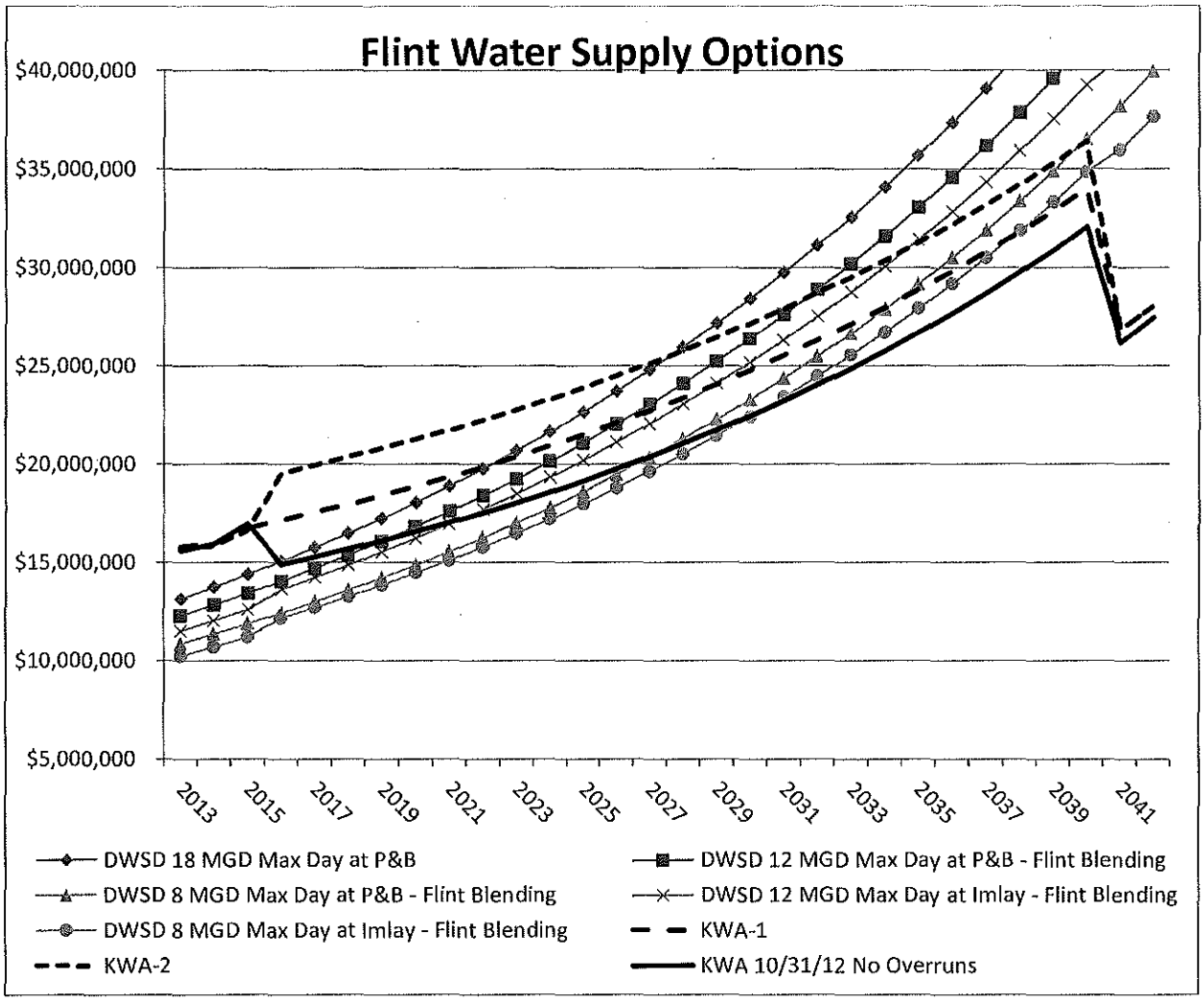


Figure 6-1: Flint Water Supply Options through 2042

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

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CONSULTING ENGINEERS-PLANNERS
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Detroit, Michigan 48226
(313)963-0612 FAX (313)963-2156

MEETING MINUTES

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.

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

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 Requirement	Rates and Charges		
		Fixed	Commodity	Avg Unit Cost
1 **Status Quo**	11,461,700	357,271	12.46	19.91
2 **Model Contract**	9,732,100	275,517	11.16	16.90
3 Change	(1,729,600)	(81,754)	(1.30)	(3.00)
4 % Change	*-15.1%*	*-22.9%*	*-10.4%*	*-15.1%*
5 **Max Day Only**	9,424,700	271,010	10.72	16.37
6 Change	(307,400)	(4,507)	(0.44)	(0.53)
7 % Change	*-3.3%*	*-1.7%*	*-4.1%*	*-3.3%*
8 **Allow Blending**	6,302,800	182,369	10.72	16.42
9 Change	(3,121,900)	(88,641)	0.00	0.05
10 % Change	*-49.5%*	*-48.6%*	*0.0%*	*0.3%*
11 **Imlay City Connections**	5,800,700	170,912	9.77	15.11
12 Change	(502,100)	(11,457)	(0.95)	(1.31)
13 % Change	*-8.7%*	*-6.7%*	*-9.7%*	*-8.7%*
14 Cumulative Change	(5,661,000)	(186,359)	(2.69)	(4.80)
15 Cumulative %Change	*-49.4%*	*-52.2%*	*-21.6%*	*-24.1%*

	Assumptions					
	Avg Day	Max Day	Peak Hour	Distance	Elevation	Sales
	mgd	*mgd*	*mgd*	*miles*	*feet*	*mgd*
1 **Status Quo**	11.8	21.6	22.6	52.0	866	**11.8**
2 **Model Contract**	11.8	**17.9**	**18.8**	52.0	866	11.8
3 **Max Day Only**	11.8	17.9	**17.9**	52.0	866	11.8
4 **Allow Blending**	7.9	**11.9**	**11.9**	52.0	866	7.9
5 **Imlay City Connections**	7.9	11.9	11.9	**45.2**	**866**	7.9

Recent DWSD Water Rates to Flint

	Rates and Charges			Annual Change			*Average*
FY	Fixed	Commodity	Avg Unit Cost	Fixed	Commodity	Avg Unit Cost	*Annual Change*
	$/mo	*$/Mcf*	*$/Mcf*	*$/mo*	*$/Mcf*	*$/Mcf*	
As Charged							
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%**
Hypothetical Model Contract							
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%**

Recent DWSD Water Rates to Flint

	Rates and Charges			Annual Change			*Average*
FY	Fixed	Commodity	Avg Unit Cost	Fixed	Commodity	Avg Unit Cost	*Annual Change*
	$/mo	*$/Mcf*	*$/Mcf*	*$/mo*	*$/Mcf*	*$/Mcf*	
As Charged							
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%**
*Hypothetical Model Contract - **Flint Only***							
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%**

Recent DWSD Water Rates to Flint

	Rates and Charges			Annual Change			*Average*
FY	Fixed	Commodity	Avg Unit Cost	Fixed	Commodity	Avg Unit Cost	*Annual Change*
	$/mo	*$/Mcf*	*$/Mcf*	*$/mo*	*$/Mcf*	*$/Mcf*	
As Charged							
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%**
*Hypothetical Model Contract - **Flint Only @ Imlay***							
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

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 Qaqish, 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.

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

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.

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Action Items for Follow-up		
Items:	***Assigned To:***	***Date to Complete***
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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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.).
8. KWA's initial charge to Flint is based on a 12 MGD maximum 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?
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.

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.

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?
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.

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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 & Baxter

Capacity

Flint ADD:	0.60	MGD	81	MCF/Day
DWSD ADD:	12	MGD	1,604	MCF/Day

Annual Volume

Flint:	29,412	MCF
DWSD:	585,561	MCF

2013 Cost of Supply

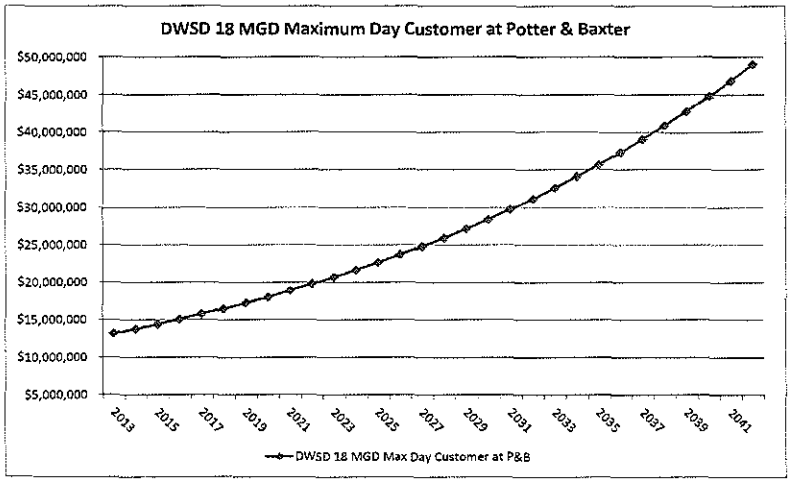
Flint WTP O&M:	120.30	/MCF	$ 3,538,214	/Yr
DWSD: $	16.37	/MCF	$ 9,585,642	/Yr

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	$ 3,538,214	9,585,642		-	$ 13,123,856
2	2014	$ 3,697,788	10,036,167		-	$ 13,733,955
3	2015	$ 3,864,558	10,507,867		-	$ 14,372,425
4	2016	$ 4,038,850	11,001,736	-	-	$ 15,040,586
5	2017	$ 4,221,002	11,518,818	-	-	$ 15,739,820
6	2018	$ 4,411,369	12,060,203	-	-	$ 16,471,571
7	2019	$ 4,610,322	12,627,032	-	-	$ 17,237,354
8	2020	$ 4,818,247	13,220,503	-	-	$ 18,038,750
9	2021	$ 5,035,550	13,841,866	-	-	$ 18,877,416
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
13	2025	$ 6,007,286	16,633,413	-	-	$ 22,640,699
14	2026	$ 6,278,215	17,415,183	-	-	$ 23,693,398
15	2027	$ 6,561,362	18,233,697	-	-	$ 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
18	2030	$ 7,489,754	20,927,376	-	-	$ 28,417,130
19	2031	$ 7,827,542	21,910,963	-	-	$ 29,738,505
20	2032	$ 8,180,564	22,940,778	-	-	$ 31,121,342
21	2033	$ 8,549,507	24,018,995	-	-	$ 32,568,502
22	2034	$ 8,935,090	25,147,887	-	-	$ 34,082,977
23	2035	$ 9,338,063	26,329,838	-	-	$ 35,667,901
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				

25 Yrs Cummulative	
$	596,916,044

30 Yrs Cummulative	
$	821,226,268

DWSD Worksheet : 12 MGD Maximum Day Customer with Model Contract at Potter & Baxter/Blending with Flint

Capacity

Flint ADD:	4	MGD	535	MCF/Day
DWSD ADD:	8	MGD	1,070	MCF/Day

Annual Volume

Flint:	195,187	MCF	195187.1658
DWSD:	390,374	MCF	
			5895097.471

2013 Cost of Supply

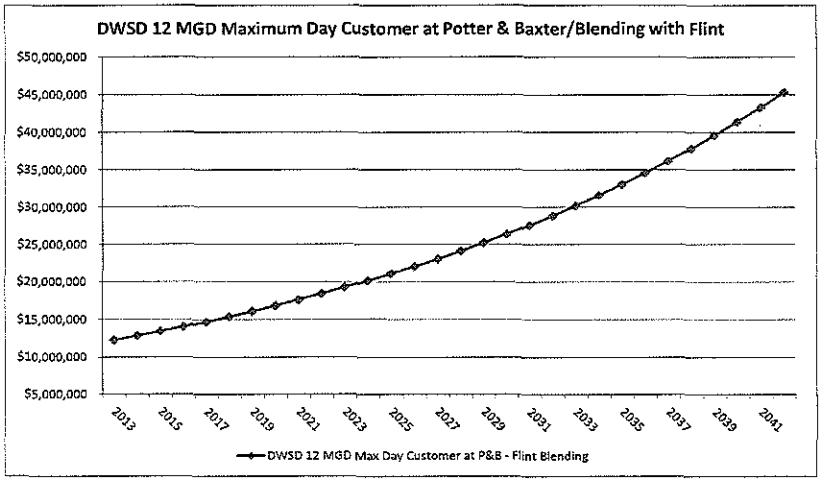
Flint WTP O&M:	$	30.20	/MCF	$ 5,895,097	/Yr
DWSD:	$	16.31	/MCF	$ 6,367,005	/Yr

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	$ 5,895,097	6,367,005		-	$ 12,262,103
2	2014	$ 6,160,966	6,666,255		-	$ 12,827,221
3	2015	$ 6,438,826	6,979,569		-	$ 13,418,395
4	2016	$ 6,729,217	7,307,608	-	-	$ 14,036,825
5	2017	$ 7,032,705	7,651,066	-	-	$ 14,683,771
6	2018	$ 7,349,880	8,010,666	-	-	$ 15,360,546
7	2019	$ 7,681,359	8,387,167	-	-	$ 16,068,527
8	2020	$ 8,027,789	8,781,364	-	-	$ 16,809,153
9	2021	$ 8,389,842	9,194,088	-	-	$ 17,583,930
10	2022	$ 8,768,224	9,626,210	-	-	$ 18,394,434
11	2023	$ 9,163,671	10,078,642	-	-	$ 19,242,313
12	2024	$ 9,576,952	10,552,338	-	-	$ 20,129,291
13	2025	$ 10,008,873	11,048,298	-	-	$ 21,057,171
14	2026	$ 10,460,273	11,567,568	-	-	$ 22,027,841
15	2027	$ 10,932,031	12,111,244	-	-	$ 23,043,275
16	2028	$ 11,425,066	12,680,473	-	-	$ 24,105,538
17	2029	$ 11,940,336	13,276,455	-	-	$ 25,216,791
18	2030	$ 12,478,845	13,900,448	-	-	$ 26,379,294
19	2031	$ 13,041,641	14,553,769	-	-	$ 27,595,410
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	20,072,537	-	-	$ 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 Cummulative	
$	554,681,686

30 Yrs Cummulative	
$	762,110,308

DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Potter & Baxter/Blending with Flint

Capacity

Flint ADD:	4	MGD	535 MCF/Day
DWSD ADD:	8	MGD	1,070 MCF/Day

Annual Volume

Flint:	195,187	MCF
DWSD:	390,374	MCF

2013 Cost of Supply

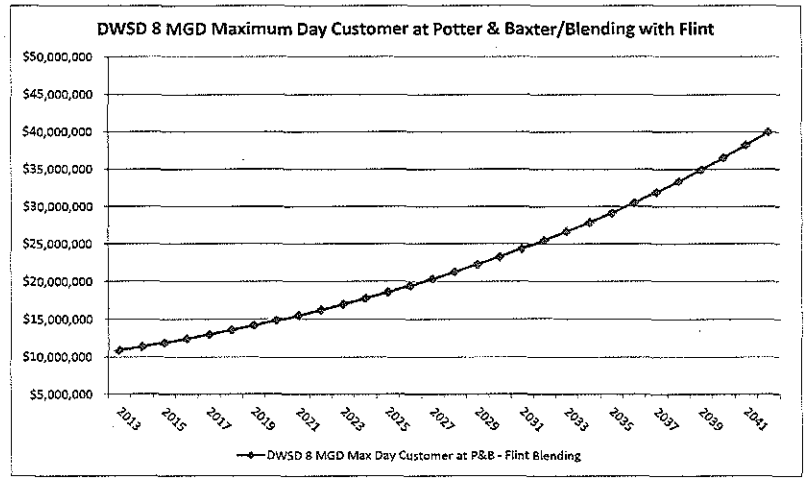
Flint WTP O&M:	$ 30.20	/MCF	$ 5,895,097	/Yr
DWSD:	$ 12.68	/MCF	$ 4,949,947	/Yr

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	$ 5,895,097	4,949,947		-	$ 10,845,044
2	2014	$ 6,160,966	5,182,594		-	$ 11,343,560
3	2015	$ 6,438,826	5,426,176		-	$ 11,865,002
4	2016	$ 6,729,217	5,681,206	-	-	$ 12,410,423
5	2017	$ 7,032,705	5,948,223	-	-	$ 12,980,928
6	2018	$ 7,349,880	6,227,789	-	-	$ 13,577,669
7	2019	$ 7,681,359	6,520,495	-	-	$ 14,201,855
8	2020	$ 8,027,789	6,826,959	-	-	$ 14,854,747
9	2021	$ 8,389,842	7,147,826	-	-	$ 15,537,668
10	2022	$ 8,768,224	7,483,774	-	-	$ 16,251,997
11	2023	$ 9,163,671	7,835,511	-	-	$ 16,999,182
12	2024	$ 9,576,952	8,203,780	-	-	$ 17,780,732
13	2025	$ 10,008,873	8,589,358	-	-	$ 18,598,230
14	2026	$ 10,460,273	8,993,057	-	-	$ 19,453,330
15	2027	$ 10,932,031	9,415,731	-	-	$ 20,347,762
16	2028	$ 11,425,066	9,858,271	-	-	$ 21,283,336
17	2029	$ 11,940,336	10,321,609	-	-	$ 22,261,945
18	2030	$ 12,478,845	10,806,725	-	-	$ 23,285,570
19	2031	$ 13,041,641	11,314,641	-	-	$ 24,356,282
20	2032	$ 13,629,819	11,846,429	-	-	$ 25,476,248
21	2033	$ 14,244,524	12,403,211	-	-	$ 26,647,735
22	2034	$ 14,886,952	12,986,162	-	-	$ 27,873,114
23	2035	$ 15,558,354	13,596,512	-	-	$ 29,154,866
24	2036	$ 16,260,035	14,235,548	-	-	$ 30,495,583
25	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 Cummulative	
$	489,780,792

30 Yrs Cummulative	
$	672,671,705

DWSD Worksheet : 12 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

Capacity

Flint ADD:	4 MGD	535	MCF/Day
DWSD ADD:	8 MGD	1,070	MCF/Day

Annual Volume

Flint:	195,187 MCF
DWSD:	390,374 MCF

2013 Cost of Supply

Flint WTP O&M:	$ 30.20	/MCF	$ 5,895,097	/Yr
DWSD:	$ 14.38	/MCF	$ 5,613,583	/Yr

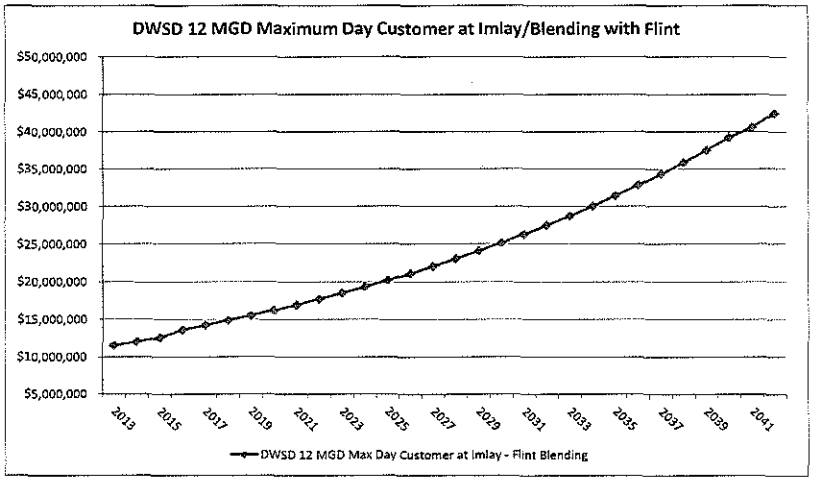
Escalation/Inflation Rate

Flint:	4.51% /Yr
DWSD:	4.7% /Yr

Capital Expenditure

Capital:	$ 4,700,000		
Bond Issuance (3% of Total):	195,000	Check:	3.0%
3 Years of Capitalized Interest:	975,000	Check:	5.0% /Yr (Bond Interest on Total)
Reserve (10% of Total):	650,000	Check:	10.0%
Total:	$ 6,520,000		

Revenue Bond Rate:	5%
Number of Years:	25
Annual Cost:	$462,610
Interest on Reserve:	3%



	Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ 5,895,097	5,613,583		19,500	$ 11,489,180
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
4	2016	$ 6,729,217	6,442,882	462,610	19,500	$ 13,615,209
5	2017	$ 7,032,705	6,745,698	462,610	19,500	$ 14,221,512
6	2018	$ 7,349,880	7,062,745	462,610	19,500	$ 14,855,735
7	2019	$ 7,681,359	7,394,694	462,610	19,500	$ 15,519,164
8	2020	$ 8,027,789	7,742,245	462,610	19,500	$ 16,213,144
9	2021	$ 8,389,842	8,106,131	462,610	19,500	$ 16,939,082
10	2022	$ 8,768,224	8,487,119	462,610	19,500	$ 17,698,452
11	2023	$ 9,163,671	8,886,013	462,610	19,500	$ 18,492,794
12	2024	$ 9,576,952	9,303,656	462,610	19,500	$ 19,323,718
13	2025	$ 10,008,873	9,740,928	462,610	19,500	$ 20,192,910
14	2026	$ 10,460,273	10,198,751	462,610	19,500	$ 21,102,134
15	2027	$ 10,932,031	10,678,093	462,610	19,500	$ 22,053,234
16	2028	$ 11,425,066	11,179,963	462,610	19,500	$ 23,048,139
17	2029	$ 11,940,336	11,705,421	462,610	19,500	$ 24,088,867
18	2030	$ 12,478,845	12,255,576	462,610	19,500	$ 25,177,531
19	2031	$ 13,041,641	12,831,588	462,610	19,500	$ 26,316,339
20	2032	$ 13,629,819	13,434,673	462,610	19,500	$ 27,507,602
21	2033	$ 14,244,524	14,066,102	462,610	19,500	$ 28,753,736
22	2034	$ 14,886,952	14,727,209	462,610	19,500	$ 30,057,271
23	2035	$ 15,558,354	15,419,388	462,610	19,500	$ 31,420,852
24	2036	$ 16,260,035	16,144,099	462,610	19,500	$ 32,847,245
25	2037	$ 16,993,363	16,902,872	462,610	19,500	$ 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 Cummulative	
$	529,865,071

30 Yrs Cummulative	
$	725,576,803

DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

Capacity

Flint ADD:	4	MGD	535	MCF/Day
DWSD ADD:	8	MGD	1,070	MCF/Day

Annual Volume

Flint:	195,187	MCF
DWSD:	390,374	MCF

2013 Cost of Supply

Flint WTP O&M:	$ 30.20	/MCF	$ 5,895,097	/Yr
DWSD:	$ 11.11	/MCF	$ 4,337,059	/Yr

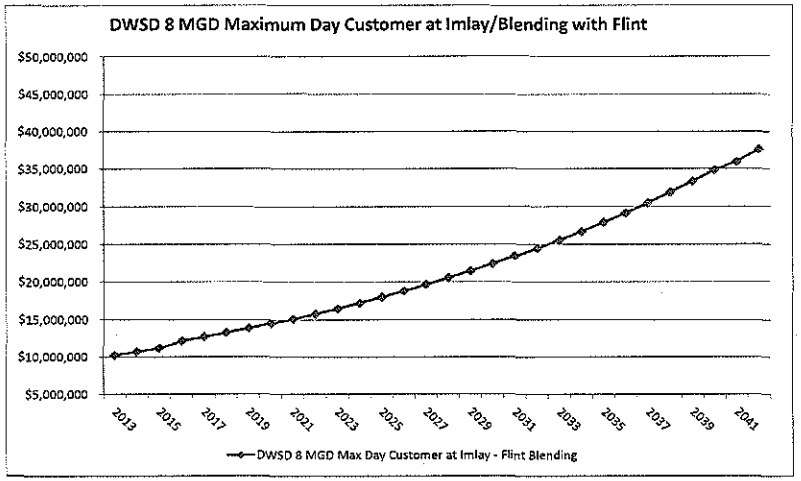
Escalation/Inflation Rate

Flint:	4.51% /Yr
DWSD:	4.7% /Yr

Capital Expenditure

Capital:	$ 4,700,000		
Bond Issuance (3% of Total):	195,000	Check:	3.0%
3 Years of Capitalized Interest:	975,000	Check:	5.0% /Yr (Bond Interest on Total)
Reserve (10% of Total):	650,000	Check:	10.0%
Total:	$ 6,520,000		

Revenue Bond Rate:	5%
Number of Years:	25
Annual Cost:	$462,610
Interest on Reserve:	3%



	Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ 5,895,097	4,337,059		19,500	$ 10,212,656
2	2014	$ 6,160,966	4,540,901		19,500	$ 10,682,367
3	2015	$ 6,438,826	4,754,323		19,500	$ 11,173,649
4	2016	$ 6,729,217	4,977,776	462,610	19,500	$ 12,150,103
5	2017	$ 7,032,705	5,211,732	462,610	19,500	$ 12,687,546
6	2018	$ 7,349,880	5,456,683	462,610	19,500	$ 13,249,673
7	2019	$ 7,681,359	5,713,147	462,610	19,500	$ 13,837,616
8	2020	$ 8,027,789	5,981,665	462,610	19,500	$ 14,452,564
9	2021	$ 8,389,842	6,262,803	462,610	19,500	$ 15,095,755
10	2022	$ 8,768,224	6,557,155	462,610	19,500	$ 15,768,489
11	2023	$ 9,163,671	6,865,341	462,610	19,500	$ 16,472,122
12	2024	$ 9,576,952	7,188,012	462,610	19,500	$ 17,208,074
13	2025	$ 10,008,873	7,525,849	462,610	19,500	$ 17,977,832
14	2026	$ 10,460,273	7,879,564	462,610	19,500	$ 18,782,947
15	2027	$ 10,932,031	8,249,903	462,610	19,500	$ 19,625,044
16	2028	$ 11,425,066	8,637,649	462,610	19,500	$ 20,505,824
17	2029	$ 11,940,336	9,043,618	462,610	19,500	$ 21,427,064
18	2030	$ 12,478,845	9,468,668	462,610	19,500	$ 22,390,624
19	2031	$ 13,041,641	9,913,696	462,610	19,500	$ 23,398,447
20	2032	$ 13,629,819	10,379,639	462,610	19,500	$ 24,452,569
21	2033	$ 14,244,524	10,867,482	462,610	19,500	$ 25,555,117
22	2034	$ 14,886,952	11,378,254	462,610	19,500	$ 26,708,316
23	2035	$ 15,558,354	11,913,032	462,610	19,500	$ 27,914,496
24	2036	$ 16,260,035	12,472,945	462,610	19,500	$ 29,176,090
25	2037	$ 16,993,363	13,059,173	462,610	19,500	$ 30,495,646
	2038	$ 17,759,764	13,672,954	462,610	19,500	$ 31,875,828
	2039	$ 18,560,729	14,315,583	462,610	19,500	$ 33,319,422
	2040	$ 19,397,818	14,988,415	462,610	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

25 Yrs Cummulative	
$	493,063,801

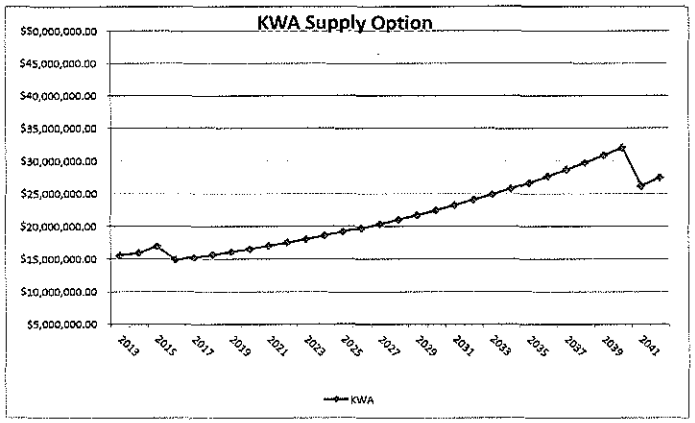
30 Yrs Cummulative	
$	634,795,488

KWA Supply Option Worksheet
KWA 10/31/12 No Overruns

	Year	DWSD & Flint WTP Costs	KWA Entry Fee	KWA Debt service	Flint WTP Debt Service	KWA Operations	Flint WTP Operations 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	6,843,344	$ 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 Cummulative	
$	503,456,186

30 Yrs Cummulative	
$	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	$ 7,913,118	/Yr
KWA:	$ 1.50	/MCF	$ 878,869	/Yr

Escalation/Inflation Rate

Flint:	4.51% /Yr
KWA:	5.0% /Yr

Capital Expenditure

David Guastella: Assumes Bond Issuance and Reserves are not included

Capital:	$ 272,421,558			
Bond Issuance (2.25% of Total):	8,440,000	Check:	2.25%	
3 Years of Capitalized Interest:	56,000,000	Check:	5.0%	/Yr (Bond Interest on Total)
Reserve (10% of Total):	37,500,000	Check:	10.0%	
Total:	$ 374,361,558			
Flint's Share (30%)	$ 112,308,467			
Revenue Bond Rate:	5%			
Number of Years:	25			
Annual Cost:	$7,968,562			
Interest on Reserve:	3%			

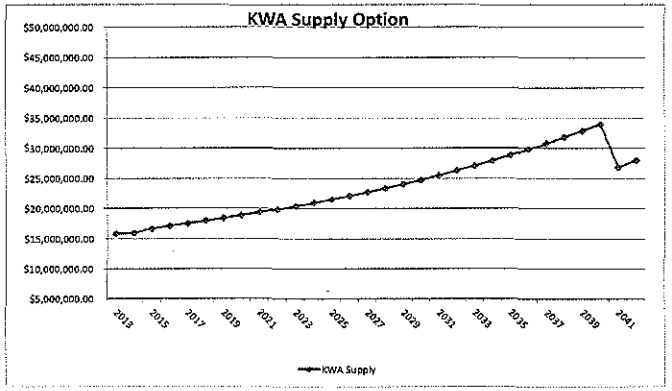
David Guastella: Increased by 3%/Yr to 2012 $'s

Capital:	$ 7,758,362			
Bond Issuance (3% of Total):	240,000	Check:	2.25%	
3 Years of Capitalized Interest:	1,600,000	Check:	5.0%	/Yr (Bond Interest on Total)
Reserve (10% of Total):	1,070,000	Check:	10.0%	
Total:	$ 10,668,362			
Revenue Bond Rate:	5%			
Number of Years:	25			
Annual Cost:	$756,946			
Interest on Reserve:	3%			

David Guastella: Flint buys water from DWSD for three years during KWA construction at current rate (assume 5% increase each year)

David Guastella: Highlighted portion is Flint's Entry Fee to KWA

	Year	Flint WTP O&M	Water Purchase	KWA Revenue Pre-bond Entry Fee & Bond Payment	Flint Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ *3,538,214*	*11,461,700*	1,152,800		369,600	$ 15,793,114
2	2014	$ *3,697,788*	*12,034,785*	581,400		369,600	$ 15,944,573
3	2015	$ *3,864,558*	*12,636,524*	581,400		369,600	$ 16,712,882
4	2016	$ 7,913,118	878,869	7,968,562	756,946	369,600	$ 17,147,896
5	2017	$ 8,270,000	922,812	7,968,562	756,946	369,600	$ 17,548,721
6	2018	$ 8,642,977	968,953	7,968,562	756,946	369,600	$ 17,967,838
7	2019	$ 9,032,775	1,017,401	7,968,562	756,946	369,600	$ 18,406,084
8	2020	$ 9,440,153	1,068,271	7,968,562	756,946	369,600	$ 18,864,332
9	2021	$ 9,865,904	1,121,684	7,968,562	756,946	369,600	$ 19,343,497
10	2022	$ 10,310,857	1,177,769	7,968,562	756,946	369,600	$ 19,844,533
11	2023	$ 10,775,876	1,236,657	7,968,562	756,946	369,600	$ 20,368,441
12	2024	$ 11,261,868	1,298,490	7,968,562	756,946	369,600	$ 20,916,266
13	2025	$ 11,769,779	1,363,414	7,968,562	756,946	369,600	$ 21,489,101
14	2026	$ 12,300,596	1,431,585	7,968,562	756,946	369,600	$ 22,088,089
15	2027	$ 12,855,352	1,503,164	7,968,562	756,946	369,600	$ 22,714,425
16	2028	$ 13,435,129	1,578,322	7,968,562	756,946	369,600	$ 23,369,359
17	2029	$ 14,041,053	1,657,239	7,968,562	756,946	369,600	$ 24,054,200
18	2030	$ 14,674,305	1,740,101	7,968,562	756,946	369,600	$ 24,770,313
19	2031	$ 15,336,116	1,827,106	7,968,562	756,946	369,600	$ 25,519,130
20	2032	$ 16,027,775	1,918,461	7,968,562	756,946	369,600	$ 26,302,144
21	2033	$ 16,750,627	2,014,384	7,968,562	756,946	369,600	$ 27,120,919
22	2034	$ 17,506,080	2,115,103	7,968,562	756,946	369,600	$ 27,977,092
23	2035	$ 18,295,605	2,220,858	7,968,562	756,946	369,600	$ 28,872,371
24	2036	$ 19,120,787	2,331,901	7,968,562	756,946	369,600	$ 29,808,546
25	2037	$ 19,983,082	2,448,496	7,968,562	756,946	369,600	$ 30,787,486
	2038	$ 20,884,319	2,570,921	7,968,562	756,946	369,600	$ 31,811,148
	2039	$ 21,826,201	2,699,467	7,968,562	756,946	369,600	$ 32,881,577
	2040	$ 22,810,563	2,834,440	7,968,562	756,946	369,600	$ 34,000,912
	2041	$ 23,839,320	2,976,162				$ 26,815,482
	2042	$ 24,914,473	3,124,970				$ 28,039,443



25 Yrs Cummulative
$ 553,731,153

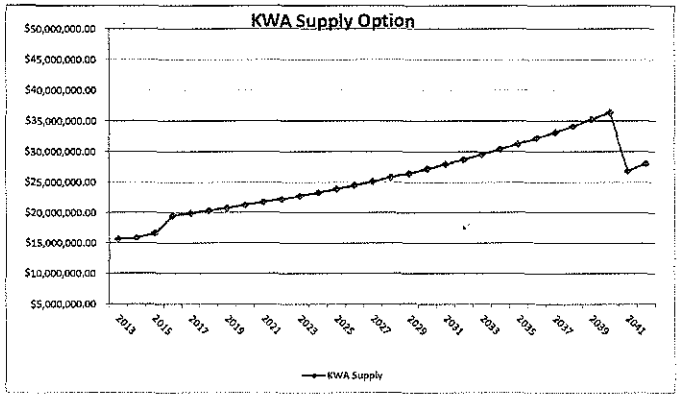
30 Yrs Cummulative
$ 707,279,715

002836

KWA Supply Option Worksheet
KWA-2

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	$ 7,913,118	/Yr	
KWA:	$ 1.50	/MCF	$ 878,869	/Yr	
Escalation/Inflation Rate					
Flint:	4.51%	/Yr			
KWA:	5.0%	/Yr			
Capital Expenditure					
Capital:	$ 357,578,060				
Bond Issuance (2.25% of Total):	11,050,000	Check:	2.25%		
3 Years of Capitalized Interest:	74,000,000	Check:	5.0%	/Yr (Bond Interest on Total)	
Reserve (10% of Total):	49,000,000	Check:	10.0%		
Total:	$ 491,628,060				
Flint's Share (30%)	$ 147,488,418				
Revenue Bond Rate:	5%				
Number of Years:	25				
Annual Cost:	$10,464,666				
Interest on Reserve:	3%				
Capital:	$ 7,758,362				
Bond Issuance (3% of Total):	240,000	Check:	2.25%		
3 Years of Capitalized Interest:	1,600,000	Check:	5.0%	/Yr (Bond Interest on Total)	
Reserve (10% of Total):	1,070,000	Check:	10.0%		
Total:	$ 10,668,362				
Revenue Bond Rate:	5%				
Number of Years:	25				
Annual Cost:	$756,946				
Interest on Reserve:	3%				

	Year	Flint WTP O&M	Water Purchase	KWA Revenue Pre-bond Entry Fee & Bond Payment	Flint Revenue Bond Payment	Interest on Reserve	TOTAL
1	2013	$ *3,538,214*	*11,461,700*	1,162,800		473,100	$ 15,689,814
2	2014	$ *3,697,788*	*12,034,785*	581,400		473,100	$ 15,840,873
3	2015	$ *3,864,558*	*12,636,524*	581,400		473,100	$ 16,609,582
4	2016	$ 7,913,118	878,869	10,464,666	756,946	473,100	$ 19,540,500
5	2017	$ 8,270,000	922,812	10,464,666	756,946	473,100	$ 19,941,325
6	2018	$ 8,642,977	968,953	10,464,666	756,946	473,100	$ 20,360,442
7	2019	$ 9,032,775	1,017,401	10,464,666	756,946	473,100	$ 20,798,688
8	2020	$ 9,440,153	1,068,271	10,464,666	756,946	473,100	$ 21,256,936
9	2021	$ 9,865,904	1,121,684	10,464,666	756,946	473,100	$ 21,736,101
10	2022	$ 10,310,857	1,177,769	10,464,666	756,946	473,100	$ 22,237,137
11	2023	$ 10,775,876	1,236,657	10,464,666	756,946	473,100	$ 22,761,045
12	2024	$ 11,261,868	1,298,490	10,464,666	756,946	473,100	$ 23,308,870
13	2025	$ 11,768,779	1,363,414	10,464,666	756,946	473,100	$ 23,881,705
14	2026	$ 12,300,596	1,431,585	10,464,666	756,946	473,100	$ 24,480,693
15	2027	$ 12,855,352	1,503,164	10,464,666	756,946	473,100	$ 25,107,029
16	2028	$ 13,435,129	1,578,322	10,464,666	756,946	473,100	$ 25,761,963
17	2029	$ 14,041,053	1,657,239	10,464,666	756,946	473,100	$ 26,446,804
18	2030	$ 14,674,305	1,740,101	10,464,666	756,946	473,100	$ 27,162,917
19	2031	$ 15,336,116	1,827,106	10,464,666	756,946	473,100	$ 27,911,733
20	2032	$ 16,027,775	1,918,461	10,464,666	756,946	473,100	$ 28,694,748
21	2033	$ 16,750,627	2,014,384	10,464,666	756,946	473,100	$ 29,513,523
22	2034	$ 17,506,080	2,115,103	10,464,666	756,946	473,100	$ 30,369,696
23	2035	$ 18,295,605	2,220,858	10,464,666	756,946	473,100	$ 31,264,975
24	2036	$ 19,120,737	2,331,901	10,464,666	756,946	473,100	$ 32,201,150
25	2037	$ 19,983,082	2,448,496	10,464,666	756,946	473,100	$ 33,180,090
	2038	$ 20,884,319	2,570,921	10,464,666	756,946	473,100	$ 34,203,752
	2039	$ 21,826,201	2,699,467	10,464,666	756,946	473,100	$ 35,274,181
	2040	$ 22,810,563	2,834,440	10,464,666	756,946	473,100	$ 36,393,516
	2041	$ 23,839,320	2,976,162				$ 26,815,482
	2042	$ 24,914,473	3,124,970				$ 28,039,443



25 Yrs Cummulative	
$	606,057,940

30 Yrs Cummulative	
$	766,784,313