



STATE OF MICHIGAN
DEPARTMENT OF TREASURY
LANSING

RICK SNYDER
GOVERNOR

NICK A. KHOURI
STATE TREASURER

DATE: November 9, 2015
TO: Wayne Workman, Deputy State Treasurer
FROM:  Randy Byrne, State Administrative Manager
SUBJECT: Flint Water

For the meeting this afternoon with Ken Sikkema regarding the Flint Task Force, I have prepared the attached timeline and relevant documents referenced during this timeframe.

Please let me know if you need anything further.

FLINT
WATER
TIMELINE

NOVEMBER
2015



RICK SNYDER
GOVERNOR

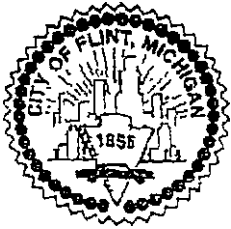
STATE OF MICHIGAN
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STATE TREASURER

Flint Water Timeline (11-09-15)

1. **June 26, 2012** – Letter from Flint EM Mike Brown to DWSD for permission to begin blending Flint River water with treated water from DWSD. The letter indicates that the DEQ is supporting this option and its implementation would save the City between \$2M and \$3M annually.
2. **September 20, 2012** – Letter from Flint EM Ed Kurtz to DWSD requesting written permission to implement the blending option. Approval is requested by October 1, 2012.
3. **October 31, 2012** – Analysis by the Flint Finance Director suggests that the annual cost to purchase water from DWSD will steadily increase to \$23M per year by fiscal year 2020.
4. **November 2012** – Treasury retains Tucker, Young, Jackson and Tull (TYJT) to evaluate the KWA proposal to the City of Flint.
5. **November 6, 2012** – Letter from Flint Emergency Manager Ed Kurtz to State Treasurer Dillon that a proposal from DWSD is expected but that the initial assessment is that switching to KWA is in the best interest of the City of Flint.
6. **February 6, 2013** – TYJT issues a final report to Treasury on the comparison between Karegnondi Water Authority (KWA) and DWSD. Analysis suggests that the KWA option is the cheaper option for the City of Flint.
7. **March 2013** – DWSD contacts the City of Flint to begin direct negotiations on a contract extension. Multiple options are provided to the Flint Emergency Manager (EM) Ed Kurtz.
8. **March 25, 2013** – The Flint City Council endorses joining KWA.
9. **April 11, 2013** – State Treasurer Andy Dillon authorizes Flint EM Ed Kurtz, pursuant to Section 12(3) of P.A. 436 of 2012, to enter into a contract with KWA if a final offer from DWSD is either not received or rejected in good faith based upon specific objections.
10. **April 15, 2013** – DWSD provides a best and final offer to the City of Flint. Analyses by Flint EM Ed Kurtz, the Department of Environmental Quality and Treasury's Office of Fiscal Responsibility independently conclude that the KWA option is cheaper for the City of Flint.

11. **April 16, 2013** – Flint EM Ed Kurtz informs the State Treasurer that the City will join KWA. This decision was officially announced May 1, 2013.
12. **April 17, 2013** – DWSD transmits a letter to Flint EM Ed Kurtz terminating service to the City of Flint, effective April 17, 2014.
13. **June 26, 2013** – Groundbreaking for the Karegnondi Water Authority begins. Flint also requests full time use of the Flint Water Treatment Plant with Flint River water as a source.
14. **June 28, 2013** – Financing Contract between the City of Flint and KWA is approved. Effective August 1, 2013. This document was signed by EM Mike Brown.
15. **July 08, 2013** – The City retains Lockwood, Andrews & Newman engineering firm to get the City's water plant up and running while the KWA pipeline is built.
16. **February 19, 2014** – The KWA Board of Directors adopts Resolution 2014-01, authorizing KWA to bond for water line construction on-behalf of the City of Flint.
17. **April 17, 2014** – Water service from DWSD officially ends. The City of Flint also conducts two separate public forums regarding the use of Flint River water, upgrades to the City's water system and the overall cost of the switch to KWA.
18. **April 25, 2014** – City conducts public event marking the transition to the use of Flint River water. DEQ information shows that transition complete by May 2015.
19. **January 2, 2015** – The City issues a press release stating the City water system exceeds the TTHM maximum contaminant level.
20. **March 3, 2015** – Flint EM Jerry Ambrose provides a memorandum to Deputy State Treasurer Wayne Workman stating that a reconnection to DWSD will cost the City \$10.1M/year and that water purchases could be as high as \$1M/month.
21. **March 12, 2015** – Veolia issues the final operational evaluation of the City's water system.
22. **September 3, 2015** – MDEQ testing of the City's water shows TTHM levels are below the required action level.
23. **September 25, 2015** – Genesee County Health Department and the City of Flint issues a lead advisory for residents to be aware of lead levels in drinking water after hearing concerns from the medical community.
24. **October 16, 2015** – The City of Flint reconnects to Detroit Water.
25. **November 4, 2015** – The EPA issues its final report on high lead levels at three residences in the City.



CITY OF FLINT

Infrastructure and Development

Dayne Walling
Mayor

Michael K. Brown
Emergency Manager

Howard D. Croft
Director

June 26, 2012

Sue F. McCormick
Director DWSD
735 Randolph St.
Detroit, MI 48226

Dear Ms. McCormick,

In cooperation with the Michigan Department of Environmental Quality (MDEQ) and city engineers, the City of Flint has undertaken a review of the regulatory requirements necessary to supply water to our residential and commercial customers. As part of our evaluation it was determined that the Flint Water Treatment Plant is capable of successfully "blending" or "co-mingling" water sources while continuing to provide quality drinking water to citizens.

The Flint Water Treatment Plant would require approximately \$1.3 million dollars in increased expenses in order to blend as much as one third (1/3) of treated river water with two thirds (2/3) of treated DWSD water. Using the 2013 DWSD rates this would result in savings of between two and three million dollars annually based on current usage data. The MDEQ has provided Flint with written documentation supporting our blending of water sources and the potential benefit.

Given this information we respectfully request written permission from DWSD to proceed with blending treated Flint River Water with treated DWSD water.

It should be understood that our goal is to deliver both high quality and economically viable water to our customers. This goal has led us to fully consider all available options including purchasing water from the Karegnondi Water Authority and use of the Flint River. We believe that in order for an option with DWSD to be successful it is essential that along with the proposed authorization to blend water that there is a guaranteed containment of the new "fixed costs" that exist in the current fee structure. The new DWSD fixed charge of \$707,000 each month regardless of amount of water used is five times the original \$143,000 each month instituted only two years ago. This has resulted in the cost of water from DWSD dropping in recent years as the overall fee has increased annually by millions although our usage has continued to decline. The continuation of this trend would render our request and goals invalid.

With the current Emergency Manager condition in Flint we believe that limiting an agreement to only three years is appropriate. This time frame would also serve as an evaluation period prior to any proposed long term agreement being considered.

We appreciate your consideration and look forward to working together.

Sincerely,

Michael K. Brown
Emergency Financial Manager Flint, Mi.

Edward J. Kurtz
Emergency Financial Manager



Dayne Walling
Mayor

September 20, 2012

Sue F. McCormick & DWSD Board
Director DWSD
735 Randolph Street
Detroit, MI 48226

Dear DWSD Board.

During the past nine months we have had several discussions with DWSD representatives regarding future water rates and other options including permission for Flint to blend treated water from DWSD. Flint currently has received written documentation from the state regulatory agency DEQ supporting the ability for Flint to safely blend treated water from Detroit.

In an effort to move forward we must have a written response from the DWSD Board that clearly states the following:

Will DWSD allow Flint to blend treated water from Detroit?

What are the rates given an estimated usage by Flint and Genesee County of:

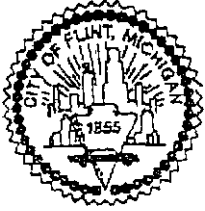
- 23 MGD Average Daily Usage
- 40 MGD Maximum Day Usage

We are requesting this information be delivered to Flint no later than October 1, 2012 so that we may evaluate all of our options and begin moving forward.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward J. Kurtz", is written over a horizontal line.

Edward J. Kurtz
Emergency Financial Manager



Dayne Walling
Mayor

CITY OF FLINT, MICHIGAN
Department of Finance

City Hall, Room #203
1101 South Saginaw Street
Flint, MI 48502
(810) 766-7268 / (810) 766-8675 (fax)

Edward J. Kurtz
Emergency Financial
Manager

Michael K. Brown
City Administrator

Gerald Ambrose
Finance Director

October 31, 2012

Edward J. Kurtz
Emergency Financial Manager
City Of Flint Municipal Center
1101 S. Saginaw Street
Flint, MI 48502

RE Cost Comparison, KWA v DWSD

Mr. Kurtz

The City of Flint is considering whether joining the Karegnondi Water Authority (KWA) is a better alternative for the residents and businesses of Flint than continuing to purchase water from the Detroit Water and Sewer District (DWSD).

An important part of this consideration is the relative cost of the alternatives. We have compared the current projected costs of continuing to purchase water from DWSD to the projected costs of purchasing water from KWA.

The projected costs of purchasing water from DWSD come from our current and past experience, as well as statements from DWSD about their future costs. The costs of purchasing water from KWA are based on the KWA Lake Huron Water Supply Study, as updated by its October 2012 Preliminary Engineering Report Update, Appendix 20, dated October 4, 2012.

Based on the current contract with DWSD, the FY13 cost of purchasing water for the City of Flint only (excluding the sale of water to Genesee County) is budgeted at \$14.4 million. Past experience indicates that it is reasonable to assume a 10% increase annually in the capacity charge from DWSD and a 5% increase in the commodity cost. It is also reasonable to assume a 5% increase in operational costs for the Flint Water Treatment Plant. Consequently, it appears that the costs for continuing to purchase water from DWSD will increase to \$22.7 million by FY20.

Edward J. Kurtz
RE. Cost Comparison, KWA v DWSD
October 30, 2012
Page 2

Conversely, joining KWA and participating in the construction of infrastructure to receive water will require an up-front cost to the City of \$2.3 million, to be paid over the first three years of joining. This would be paid by the City during the construction period while the City continues to purchase its water from DWSD. However, once the construction is complete and water delivery commences, the City's capacity charge will be fixed, based on the debt service necessary to finance construction. Operational costs for KWA water delivery and the Flint WTP are projected to increase by 5% annually.

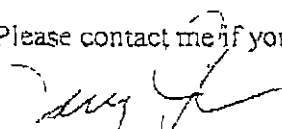
Based on the assumptions in this comparison, the annual projected cost of purchasing water for the City of Flint is 15% or \$2.6 million LESS using the KWA option in the first year of operation, increasing to 27% or \$6.1 million LESS in the fifth year of operation. The only caveat is that in order to achieve this, the City will need to upfront KWA \$3.25 million over 3 years prior to KWA beginning water delivery

Concerns have been raised about the potential of cost overruns and delays in construction. These are reasonable concerns. An additional analysis, assuming a 15% cost overrun, and a one-year delay in construction, indicates that the gain to be achieved from participating in KWA is lessened (from \$2.6 million in the first year to \$2.3 million) and the City's upfront contribution is ~~increased to \$10.4 million if the City is required to make its first year's debt service payment before operations begin.~~ The City's gain from participating in KWA is delayed, but once operations begin, the City's annual costs are less than continuing with DWSD, becoming net positive in FY20. However, given the City's precarious financial position, it is likely that the City would need to find some source of capital if such an up-front payment were necessary.

Finally, we have also analyzed what constraints DWSD would need to impose on its contract with the City of Flint in order to be a positive financial option. It would appear that if the capacity costs to Flint were to be fixed at the FY13 level and if annual operating cost increases were capped at 2.25%, then the cost to the City of Flint could be less than KWA.

Attached are the three projections summarized above. First is the "Original Projection" utilizing the KWA Study. Second is the "Worse Case Projection" with cost increases and construction delays. Third is the reduced DWSD costs associated with fixed capacity costs and capped increases in operational costs.

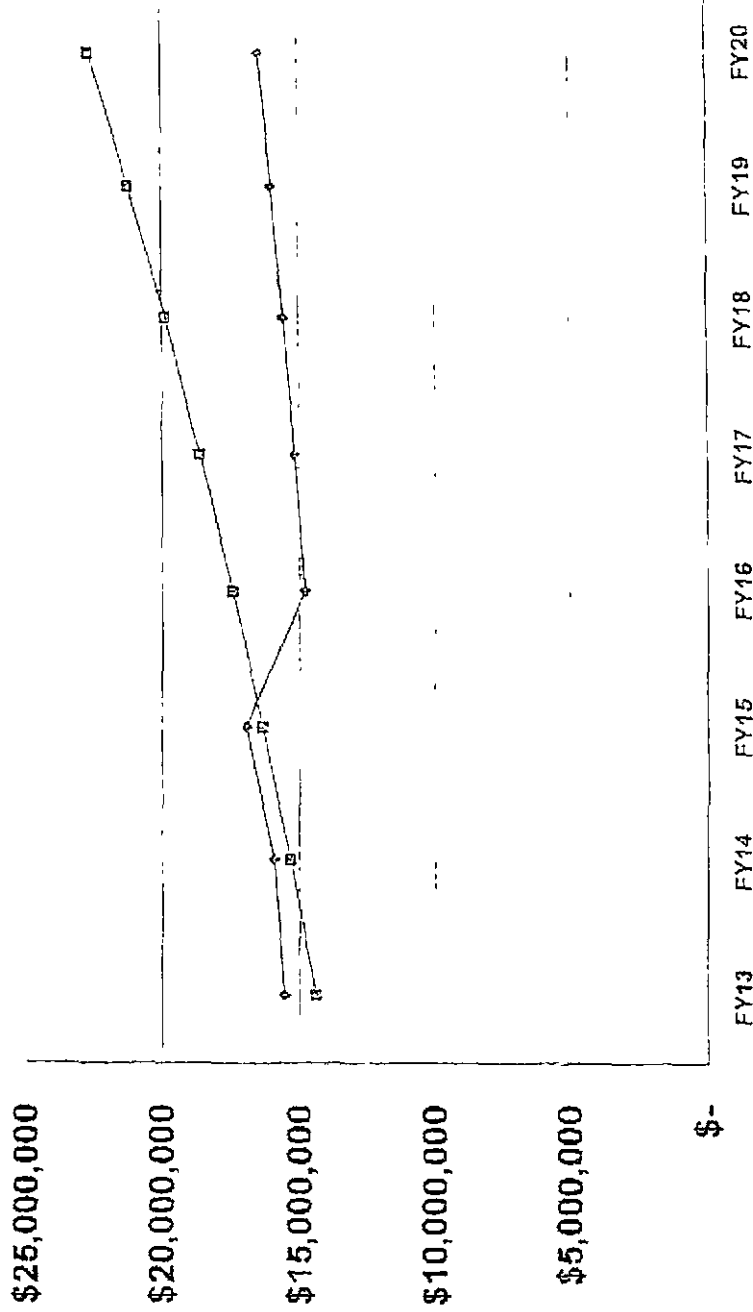
Please contact me if you have any questions.


Gerald Ambrose
Director of Finance

GA:js
Attachments

273 421,558
19 383,876
283 234,774
P.E.
702-116

Original Projection - Summary Comparison: KWA vs DWSD



Water & Sewer Cash Flow with KWA

Current DWSD & FWTP Water & Sewer Cash Flow

\$272M investment 8-15 years
7M up front
plant
same water
- Delivering plant & water
to front plant a.c.
to plant bay
plant

ORIGINAL PROJECTION
SUMMARY COMPARISON: KWA v DWSD

Water and Sewer Cash Flow with KWA

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Current DWSD & FWTP Costs	\$ 14,413,858	\$ 15,355,135	\$ 16,365,534	\$ -	\$ -	\$ -	\$ -	\$ -
KWA Entry Fee, FY 2, 2.5, and	\$ 1,162,800	\$ 581,400	\$ 581,400	\$ -	\$ -	\$ -	\$ -	\$ -
KWA Debt Service	\$ -	\$ -	\$ -	\$ 6,592,155	\$ 6,593,165	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155
FWTP Debt Service	\$ -	\$ -	\$ -	\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781
KWA operations	\$ -	\$ -	\$ -	\$ 878,869	\$ 922,812	\$ 968,953	\$ 1,017,401	\$ 1,068,271
FWTP operations w KWA	\$ -	\$ -	\$ -	\$ 8,843,344	\$ 7,185,511	\$ 7,544,767	\$ 7,922,028	\$ 8,318,128
Total Costs	\$ 16,576,658	\$ 15,936,535	\$ 16,946,934	\$ 14,888,148	\$ 15,274,260	\$ 16,815,615	\$ 17,105,302	\$ 17,552,334

Water and Sewer Cash Flow with DWSD

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Current DWSD & FWTP Costs	\$ 14,413,858	\$ 15,355,135	\$ 16,365,534	\$ 17,450,717	\$ 18,516,851	\$ 19,670,659	\$ 21,219,435	\$ 22,871,185

Cash Flow Difference: KWA and DWSD

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Annual Cost: DWSD - KWA	\$ (1,162,800)	\$ (581,400)	\$ (501,400)	\$ 2,592,568	\$ 3,342,581	\$ 4,180,974	\$ 5,114,072	\$ 6,118,051
Cumulative Gain with KWA	\$ (1,162,800)	\$ (1,744,200)	\$ (2,325,600)	\$ 230,968	\$ 3,579,559	\$ 7,770,533	\$ 12,884,605	\$ 19,003,456

This projection assumes that KWA begins delivery of water to Flint starting in July, 2016. Any interest on the bonds will be capitalized until that period. The City will be obligated to begin paying its \$2,325,600 entry fee in FY13. 2 payments of \$581,400 in FY13, 1 payment in FY14 and 1 payment in FY15.

(1) The cost of the KWA option is projected to be \$2,582,568 or 15% LESS than DWSD in the first year of operation (Year 4). This gain offsets the upfront costs of \$2,325,600 by \$236,968.

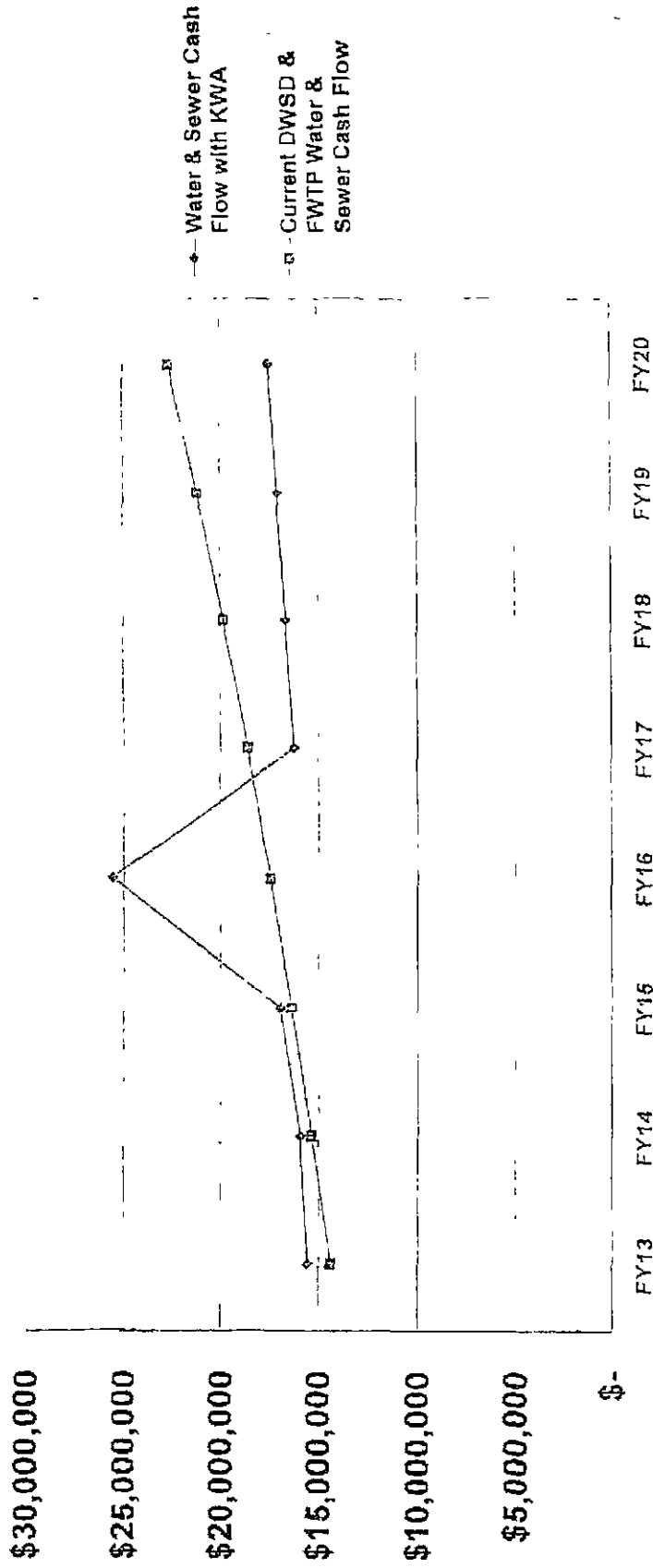
(2) The cost of the KWA option is projected to be \$8.1 million or 27% LESS than DWSD in the 6th year of operation (Year 6).

(3) The cumulative savings by the 8th year from the beginning of the project are projected to be \$19 million.

(4)

KWA Entry Costs (1)	\$ 1,102,800	\$ 581,400	\$ 581,400	\$	\$	\$	\$	\$
Fixed KWA Construction Cost (2)				\$ 6,593,155	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155
Escalator				100	100	100	100	100
Fixed Flint WTP Construction Cost (3)				\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781
Escalator				100	100	100	100	100
Flint WTP Operating Cost (4)	\$ 5,911,538	\$ 6,207,115	\$ 6,517,471	\$ 6,813,344	\$ 7,185,911	\$ 7,544,787	\$ 7,922,026	\$ 8,310,128
Escalator	105	105	105	105	105	105	105	105
KWA Commodity Charge (5)	\$ 769,200	\$ 797,100	\$ 837,018	\$ 878,869	\$ 922,812	\$ 969,853	\$ 1,017,401	\$ 1,068,271
Escalator	105	105	105	105	105	105	105	105
TOTAL			KWA NOT AVAILABLE	\$ 14,888,149	\$ 15,274,280	\$ 15,679,676	\$ 16,106,303	\$ 16,552,331
(1)	The City will, upon joining, be required to pay an initial fee of \$32,300 per MGD plus the same amount for each year until bonding for the project is obtained. At 18MGD, the City's cost is \$681,400 annually. Since it is projected that fee will be assessed for 3 years, the City's upfront cost is projected at \$2,325,600.							
(2)	Per KWA proposal, project cost is \$272 million. City's fixed cost would be 30% of debt service, based on capacity design of 60mgd, of which 18MGD is for Flint. Debt service is based on 6% interest rate @ 25 years. 5% added to principal for capitalized interest for FY13, FY14 and FY15. (\$272,421,688 plus \$13,621,078 for 3 years = \$313,284,792)							
(3)	Per KWA proposal, the cost of upgrading the Flint is \$7.1 million. City's fixed cost would be 100% of debt service based on 6% interest rate @ 25 years, with 5% added to cover capitalized interest for FY13, FY14, and FY15. (total principal = \$8.105 million)							
(4)	Per FY13 Budget annual cost of WTP is \$4,111,630. \$1.6 million for electricity and chemicals & 2 FPE's are added. 100% City cost. 100%							
(5)	Per KWA proposal, initial commodity charge would be based on \$7.30/unit or 7.500 gallons. Charge is based on 12MGD							

Worst Case Scenario - Summary Comparison KWA vs DWSD (15% Cost Overrun; One year delay in Water Supply delivery)



WORSE CASE PROJECTION
SUMMARY COMPARISON: KWA v DWSD
(15% Cost Overrun; One year delay in Water Supply delivery)

Water and Sewer Cash Flow with KWA

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Current DWSD & FWTP Costs	\$ 14,413,858	\$ 15,355,135	\$ 16,366,534	\$ 17,450,717	\$ -	\$ -	\$ -	\$ -
KWA Entry Fee	\$ 1,192,800	\$ 581,400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
KWA Debt Service	\$ -	\$ -	\$ -	\$ 7,582,128	\$ 7,582,128	\$ 7,582,128	\$ 7,582,128	\$ 7,582,128
FWTP Debt Service	\$ -	\$ -	\$ -	\$ 658,698	\$ 658,698	\$ 658,698	\$ 658,698	\$ 658,698
KWA operations	\$ -	\$ -	\$ -	\$ -	\$ 922,812	\$ 968,953	\$ 1,017,401	\$ 1,058,271
FWTP operations w KWA	\$ -	\$ -	\$ -	\$ -	\$ 7,185,511	\$ 7,544,787	\$ 7,922,026	\$ 8,318,128
Total Costs	\$ 15,675,538	\$ 15,936,535	\$ 16,366,534	\$ 25,031,644	\$ 15,168,130	\$ 16,197,655	\$ 17,180,253	\$ 17,627,225

Water and Sewer Cash Flow with DWSD

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Current DWSD & FWTP Costs	\$ 14,413,858	\$ 15,355,135	\$ 16,366,534	\$ 17,450,717	\$ 18,516,951	\$ 19,670,680	\$ 21,219,435	\$ 22,871,185

Cash Flow Difference: KWA and DWSD

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Annual KWA - DWSD	\$ (1,192,800)	\$ (581,400)	\$ (581,400)	\$ (8,210,826)	\$ 2,287,700	\$ 3,118,084	\$ 4,038,182	\$ 5,043,960
Cumulative	\$ (1,192,800)	\$ (1,774,200)	\$ (2,355,600)	\$ (10,566,426)	\$ (8,288,726)	\$ (5,162,642)	\$ (1,143,460)	\$ 3,900,500

"Worse Case" scenario differs from Original in these respects:

- (1) Delivery of water to Flint from KWA is delayed by one year and construction costs are 15% above the original projection. Consequently, the City is required to begin paying for debt service one year before KWA begins delivery of water. This is in addition to its obligation to pay its initial entry fee of \$581,400 plus \$581,400 annually for the first 3 years.
- (2) Once KWA begins delivering water in year 5, the annual operating costs are less than DWSD by 15%. Considering \$10.8 million in upfront costs in the first 4 years prior to KWA operation, the cumulative cost of KWA exceeds the cost of DWSD until year 8.
- (3) Cumulative savings by Year 8 are projected to be \$3.9 million, compared to \$19 million in the original projection.

Worst Case Scenario

Cost Comparisons. Water Supply to City of Flint from DWSD and proposed KWA project

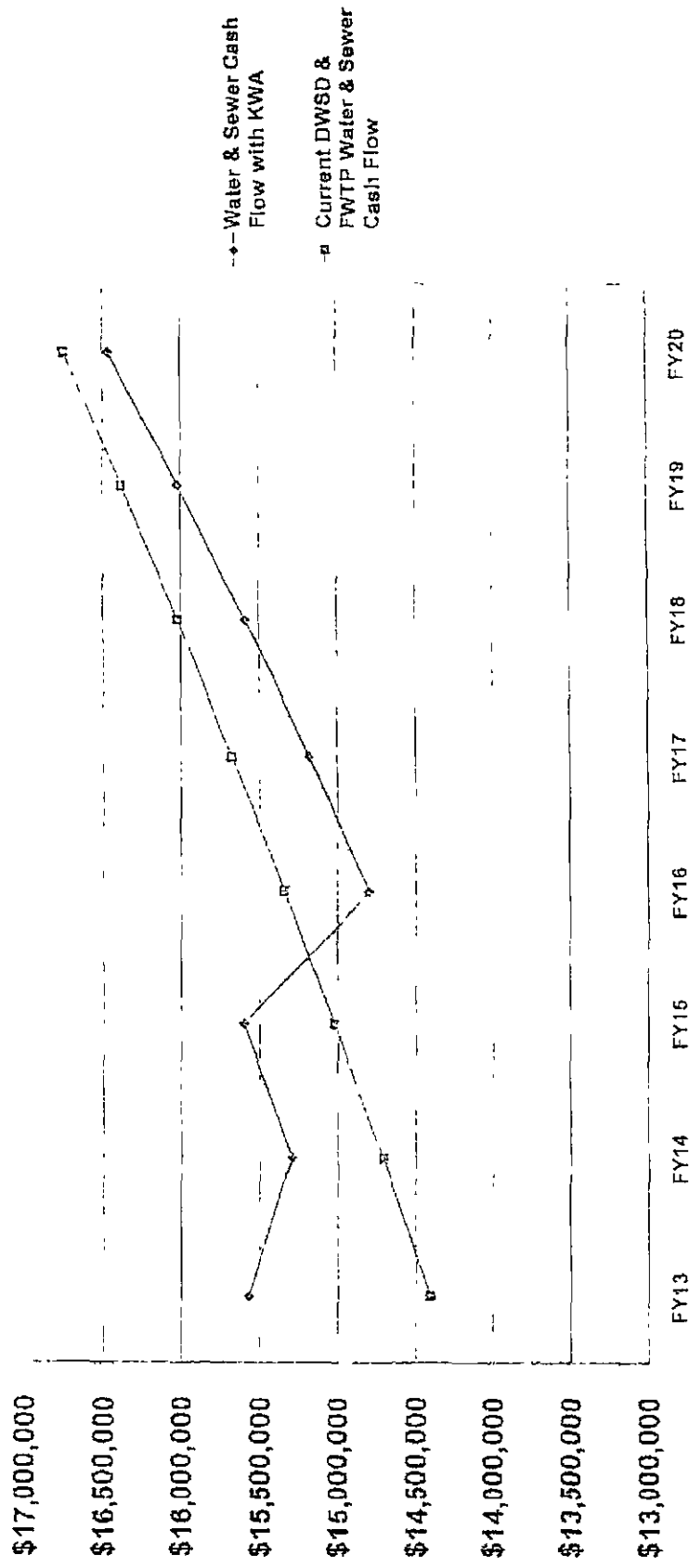
Cost of water to City of Flint (excluding Genesee) using continued service from DWSD

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
Fixed Cost (1)	\$ 4,411,860	\$ 4,852,848	\$ 5,330,133	\$ 5,817,946	\$ 6,459,141	\$ 7,105,055	\$ 7,815,500	\$ 8,587,110
Commodity Cost (2)	\$ 7,275,640	\$ 7,640,472	\$ 8,022,496	\$ 8,423,620	\$ 8,844,801	\$ 9,287,041	\$ 9,751,394	\$ 10,238,963
Flint WTP Operating Cost (3)	\$ 2,725,539	\$ 2,861,815	\$ 3,003,906	\$ 3,155,151	\$ 3,312,908	\$ 3,478,554	\$ 3,657,482	\$ 3,835,106
TOTAL	\$ 14,413,039	\$ 15,355,136	\$ 16,356,534	\$ 17,450,717	\$ 18,616,851	\$ 19,870,650	\$ 21,219,435	\$ 22,671,185
(1) Per FY13 Budget and DWSD Contract, fixed charge from DWSD for FY13 is \$707,100 per month or \$8.5 million total. Flint's cost is 52% of \$4.4 million total.								
(2) Per FY13 Budget and DWSD Contract, fixed charge from DWSD for FY13 is \$707,100 per month or \$8.5 million total. Flint's cost is 52% of \$12.40 million total (\$395).								
(3) Per FY13 Budget, annual cost of WTP is \$4.1 million. Genesee County pays \$1,368,000 for emergency back up service.								

Cost of water to City of Flint using proposed KWA project for water supply to Flint WTP

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
KWA Entry Costs (1)	\$ 1,162,860	\$ 581,400	\$ 581,400	\$ -	\$ -	\$ -	\$ -	\$ -
Fixed KWA Construction Cost (2)				\$ 7,082,128	\$ 7,582,128	\$ 7,582,128	\$ 7,582,128	\$ 7,582,128
Fixed Flint WTP Construction Cost (3)				\$ 858,888	\$ 858,888	\$ 858,888	\$ 858,888	\$ 858,888
Flint WTP Operating Cost (4)	\$ 5,911,538	\$ 6,207,115	\$ 6,511,471	\$ 6,843,344	\$ 7,185,511	\$ 7,544,787	\$ 7,922,026	\$ 8,318,128
KWA Commodity Charge (5)	\$ 759,200	\$ 787,100	\$ 837,016	\$ 878,869	\$ 922,812	\$ 968,953	\$ 1,017,401	\$ 1,068,271
TOTAL	\$ 16,349,160	\$ 16,349,160	\$ 16,349,160	\$ 16,349,160	\$ 16,349,160	\$ 16,349,160	\$ 16,349,160	\$ 16,349,160
(1) The City will, upon taking, be required to pay a, initial fee of \$32,300 per MGD plus the same amount for each year until bonding for the project is obtained. At 18MGD, the City's cost is \$581,400, for a total of \$2,325,800.								
(2) Per KWA proposal, original project cost is \$272 million. City's fixed cost would be 30% of debt service, based on capacity design of 60MGD, of which 18MGD is for Flint. Debt service is based on 5% interest rate @ 25 years = \$313,284,792. The costs here are increased by 15%, debt service starts in FY15 but water is not available until FY17.								
(3) Per KWA proposal, the cost of upgrading the Flint is \$7.1 million. City's fixed cost would be 100% of debt service based on 5% interest rate @ 25 years) with 5% added to cover capitalized interest for FY13, FY14, and FY15 (total principal = \$8.165 million). Agate costs here are increased by 15%; debt service starts in FY18 but water is not available until FY17. Debt service is now on \$9.4 million.								
(4) Per FY13 Budget annual cost of WTP is \$4,111,538. \$1.6 million for electricity and chemicals & 2 FTE's are added. 100% City cost.								
(5) Per KWA proposal, initial commodity charge would be based on \$1.30/unit or 7,500 gallons. Charge is based on 12MGD.								

ALTERNATE PROJECTION - SUMMARY COMPARISON: KWA V DWSD
 WITH DWSD COSTS REDUCED (Fixed Costs held constant; Commodity
 Costs Increased by 2.25% Annually)



ALTERNATE PROJECTION
SUMMARY COMPARISON: KWA v DWSD WITH DWSD COSTS REDUCED
(FIXED COSTS HELD CONSTANT; COMMODITY COSTS INCREASED BY 2.25% ANNUALLY)

Water and Sewer Cash Flow with KWA

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Current DWSD & FWTP Costs	\$ 14,413,858	\$ 14,713,859	\$ 15,024,358	\$ -	\$ -	\$ -	\$ -	\$ -
KWA Entry Fee	\$ 1,162,800	\$ 581,400	\$ 581,400	\$ -	\$ -	\$ -	\$ -	\$ -
KWA Debt	\$ -	\$ -	\$ -	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155
FWTP Debt	\$ -	\$ -	\$ -	\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781
KWA operations	\$ -	\$ -	\$ -	\$ 878,869	\$ 922,812	\$ 968,953	\$ 1,017,401	\$ 1,066,271
FWTP operations w KWA	\$ -	\$ -	\$ -	\$ 6,843,344	\$ 7,185,511	\$ 7,544,787	\$ 7,922,028	\$ 8,318,128
Total Costs	\$ 15,576,658	\$ 15,295,259	\$ 15,605,758	\$ 14,888,149	\$ 15,274,260	\$ 15,679,678	\$ 16,105,363	\$ 16,552,334

Water and Sewer Cash Flow with DWSD

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Current DWSD & FWTP Costs	\$ 14,413,858	\$ 14,713,859	\$ 15,024,358	\$ 15,345,778	\$ 15,678,582	\$ 16,023,172	\$ 16,380,091	\$ 16,749,823

Cash Flow Difference: KWA and DWSD

	Year 1 FY13	Year 2 FY14	Year 3 FY15	Year 4 FY16	Year 5 FY17	Year 6 FY18	Year 7 FY19	Year 8 FY20
Annual Cost: DWSD - KWA	\$ (1,162,800)	\$ (581,400)	\$ (581,400)	\$ 457,629	\$ 404,302	\$ 343,496	\$ 274,728	\$ 197,489
Cumulative Gain with KWA	\$ (1,162,800)	\$ (1,744,200)	\$ (2,325,600)	\$ (1,867,971)	\$ (1,463,669)	\$ (1,120,173)	\$ (845,445)	\$ (647,956)

(1) This projection assumes that DWSD fixed costs remain at 2013 levels and that operating costs increase by 2.25% annually

(2) KWA costs are as in the Original Projection

(3) In this comparison, KWA costs are still less once operations begin (by 2.5%), and cumulative gain does not occur until after year 8. Over time, DWSD costs could be less with these limitations on cost increases

Detail of Cost Protections

FINAL

10/31/2012

Cost Comparisons: Water Supply to City of Flint from DWSD and proposed KWA project
(FIXED COSTS HELD CONSTANT; COMMODITY COSTS INCREASED BY 2.25% ANNUALLY)

Cost of water to City (excluding Genesee) using continued service from DWSD with modified escalator

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
Fixed Cost (1)	\$ 4,411,680	\$ 4,411,680	\$ 4,411,680	\$ 4,411,680	\$ 4,411,680	\$ 4,411,680	\$ 4,411,680	\$ 4,411,680
Commodity Cost (2)	\$ 7,276,640	\$ 7,440,364	\$ 7,607,773	\$ 7,778,947	\$ 7,953,974	\$ 8,132,938	\$ 8,315,929	\$ 8,503,038
Flint WTP Operating Cost (3)	\$ 2,725,538	\$ 2,861,816	\$ 3,004,906	\$ 3,155,151	\$ 3,312,908	\$ 3,478,554	\$ 3,652,482	\$ 3,836,100
TOTAL	\$ 14,413,858	\$ 14,713,859	\$ 15,024,358	\$ 15,345,778	\$ 15,678,562	\$ 16,023,172	\$ 16,380,091	\$ 16,749,823

Cost of water to City of Flint using proposed KWA project for water supply to Flint WTP

	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
KWA Entry Costs (1)	\$ 1,102,800	\$ 581,400	\$ 581,400	\$ 581,400	\$ -	\$ -	\$ -	\$ -
Fixed KWA Construction Cost (2)				\$ 6,593,165	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155	\$ 6,593,155
Fixed Flint WTP Construction Cost (3)				\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781	\$ 572,781
Flint WTP Operating Cost (4)	\$ 5,811,638	\$ 6,207,115	\$ 6,517,471	\$ 6,843,344	\$ 7,185,511	\$ 7,544,707	\$ 7,922,026	\$ 8,318,120
KWA Commodity Charge (5)	\$ 759,200	\$ 797,160	\$ 837,018	\$ 878,869	\$ 922,817	\$ 968,953	\$ 1,017,401	\$ 1,068,271
TOTAL				\$ 14,088,149	\$ 15,274,260	\$ 15,678,676	\$ 16,105,363	\$ 16,552,334

Detroit Water and Sewerage Department
CS-1486
Flint Transmission System

Summary of Construction Cost

(1) Facilities	Base Cost	Contingency	Subtotal	GC, Insurance, Bonds, Mob/Demob., Allowances	Escalation	Cost
South Transmission Main	\$ 180,552,670	\$ 18,055,267	\$ 198,607,937	\$ 36,446,873	\$ 28,206,577	\$ 263,261,387
North Transmission Main	\$ 152,354,280	\$ 15,235,428	\$ 167,589,708	\$ 32,284,868	\$ 23,984,949	\$ 223,859,525
Grand Blanc Pumping Station	\$ 29,171,593	\$ 2,917,169	\$ 32,088,762	\$ 8,738,838	\$ 4,899,287	\$ 45,726,877
(2)(3) Total Cost	\$ 362,078,543	\$ 36,207,854	\$ 398,286,397	\$ 77,470,379	\$ 57,090,813	\$ 532,847,689

(1) The Transmission Main and Grand Blanc Pumping Station shall be constructed under 3 separate construction contracts as follows:

1. Construction Contract No. 1 shall include the construction of the Transmission Main from the connection to the NOTS in Orion Township to the Oakland/Genesee County line (approximately 121,100 ft). The total Contract 1 construction cost is estimated to be \$ 263,261,387.
2. Construction Contract No. 2A shall include the construction of the Transmission Main from the Oakland/Genesee County line to the connection to the DWSD system near the Potter Road/Baxter Road intersection in Davison Township (approx 120,300 ft). The total Contract 2 construction cost is estimated to be \$ 223,859,525.
3. Construction Contract No. 2B shall include the construction of the Grand Blanc Pumping Station. The total Contract 3 construction cost is estimated to be \$ 45,726,877.

(2) Construction duration of the project is approximately 3 years. An escalation @ 6% per year is added to cover second and third year of construction.

(3) CM fee is not included in this cost estimate

Detroit Water and Sewage Department

CS-1488

The Flint Transmission System

Construction Cost Estimate - South Transmission Main - Contract No. 1

Item	Unit	Quantity	Unit Cost	Total Cost
Division 1: GENERAL REQUIREMENTS				
D1100 Traffic Control				
Signs	SF	8,850	\$ 28	\$ 198,250
Moveable Message Boards	EA	4	\$ 25,000	\$ 100,000
Barricades	FT	16,000	\$ 75	\$ 1,200,000
Cones	EA	2,500	\$ 20	\$ 50,000
Truck-Mounted Attenuator	MO	24	\$ 42,500	\$ 1,020,000
Temporary Roads	SY	170,000	\$ 10	\$ 1,700,000
D1140 Soil Erosion and Sedimentation Control				
Silt Fence	LF	198,000	\$ 5	\$ 990,000
Hay Bales	LF	2,000	\$ 10	\$ 20,000
Subtotal Division 1 =				\$ 5,224,250
Division 2: SITE WORK				
D2100 Site Clearing				
Medium Brush	AC	38	\$ 500	\$ 19,000
Light Trees	AC	8	\$ 4,000	\$ 32,000
Topsoil Stripping	CY	35,750	\$ 8	\$ 446,000
D2140 Dewatering				
Pumping - Operation	MO	16	\$ 45,000	\$ 810,000
Well Point System - Install/Remove	LF Hor	60,000	\$ 100	\$ 6,000,000
D2221 Trenching, Backfilling and Compacting				
Pavement Sawcutting and Removal	SY	22000	\$ 8	\$ 176,000
Pavement Milling	SY	22000	\$ 2	\$ 44,000
Excavation - Pipeline	CY	844,800	\$ 5	\$ 4,224,000
Granular Material	CY	17,500	\$ 30	\$ 525,000
Backfill and Compaction	CY	882,000	\$ 5	\$ 4,410,000
D2236 Pipe Boring and Jacking				
Tunnel Casing	LF	6,250	\$ 7,250	\$ 45,385,000
Launching and Recovering Pile	EA	29	\$ 150,000	\$ 4,350,000
Soil Pre-Conditioning	LF	615	\$ 3,600	\$ 2,214,000
Mining Setup	EA	29	\$ 100,000	\$ 2,900,000
Cofferdams	SF	6,800	\$ 40	\$ 264,000
Shoring	SF	345,000	\$ 40	\$ 13,800,000
D2600 Manholes				
6 Dia Manhole	EA	250	\$ 2,500	\$ 625,000
Frame and Cover	EA	310	\$ 500	\$ 155,000
D2628 Prestressed Concrete Cylinder Pipe				
PCCP	LF	126,720	\$ 550	\$ 69,696,000
D2875 Characterization of Water Main				
Flushing and Testing	MI	24	\$ 38,000	\$ 864,000
Sanitation	MI	24	\$ 5,000	\$ 120,000
D2730 Aggregate Base and Surface Course				
Base Course Design Layer	CY	15,000	\$ 100	\$ 1,500,000
D2740 Bituminous Paving				
Binder - 2-1/2"	SY	38,526	\$ 10	\$ 385,250
Wearing - 1-1/2"	SY	62,000	\$ 6	\$ 312,000
D2755 - Concrete Curb, Gutter and Sidewalks				
Concrete Curb and Gutter	LF	3,430	\$ 11	\$ 37,730
D2760 - Sidewalk, Sidewalk Ramps and Driveways				
Driveway Replacement - Asphalt	SY	3,800	\$ 9	\$ 34,200
Driveway Replacement - Concrete	SF	3,150	\$ 5	\$ 15,750
D2820 - Chain Link Fences and Gates				
Fencing	LF	20,000	\$ 20	\$ 400,000
D2900 - Landscaping				
Topsoil	CY	18,337	\$ 20	\$ 366,740
Trees	EA	7,700	\$ 50	\$ 385,000
Grading	SY	440,000	\$ 2	\$ 880,000
Seeding	SY	440,000	\$ 2	\$ 880,000
Subtotal Division 2 =				\$ 167,260,576
Division 3: CONCRETE				
Mud Mat	CY	591	\$ 350	\$ 206,850
Floor Slab	CY	885	\$ 600	\$ 531,000
Walls	CY	3,577	\$ 600	\$ 2,126,200
Top Slab	CY	1,312	\$ 600	\$ 787,200
Pipe Encasement	CY	2,300	\$ 400	\$ 820,000
Subtotal Division 3 =				\$ 4,531,250

**Detroit Water and Sewage Department
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The Flint Transmission System

Construction Cost Estimate - South Transmission Main - Contract No. 1

Item	Unit	Quantity	Unit Cost	Total Cost
Division 8: METALS				
05630 - Access Hatches				
Floor Doors	EA	4	\$ 2,500	\$ 10,000
Subtotal Division 8 =				\$ 10,000
Division 16: MECHANICAL				
15050 - Misc. Piping and Pipe				
Harnessed Couplings - 80"	EA	2	\$ 12,000	\$ 24,000
Duplex Sump Pumps	EA	8	\$ 5,000	\$ 40,000
15082 - Steel Pipe				
8" Blowoff	LF	1,200	\$ 60	\$ 72,000
15104 - Metal Seated Gate Valves				
8" Gate Valves - Blowoff	EA	80	\$ 1,000	\$ 80,000
16" Gate Valves - Outlets	EA	5	\$ 10,000	\$ 50,000
38" Gate Valves	EA	0	\$ 10,000	\$ -
60" Gate Valves	EA	30	\$ 275,000	\$ 8,250,000
38" Cone Valves	EA	0	\$ 150,000	\$ -
15108 - Air Release and Combination Air Valves				
Manual Air Release Valves - 1-1/2"	EA	80	\$ 1,000	\$ 80,000
Automatic Air Release Valves - 1"	EA	80	\$ 2,000	\$ 160,000
Combination Air/Vacuum and Air Release - 8"	EA	2	\$ 10,000	\$ 20,000
Piping and Vents	EP	82	\$ 1,500	\$ 123,000
15140 - Pipe Supports				
Concrete Pipe Supports	EA	31	\$ 2,500	\$ 77,500
Subtotal Division 16 =				\$ 8,986,500
Division 18: ELECTRICAL				
Vault Electrical	LS	8	\$ 20,000	\$ 160,000
Subtotal Division 18 =				\$ 160,000
Division 17: INSTRUMENTATION AND CONTROLS				
17200 - Computer Systems Hardware				
Hardware, Software and Installation	EA	8	\$ 15,000	\$ 120,000
17350 - Multiple Address Radio Equipment				
Remote Telemetry Unit	EA	8	\$ 7,500	\$ 60,000
17520 - Flow Instruments				
Magnohelic Flow Meters	EA	2	\$ 75,000	\$ 150,000
17530 - Pressure and Level Instruments				
Pressure Transmitters	EA	8	\$ 5,000	\$ 40,000
Subtotal Division 17 =				\$ 370,000
Subtotal Division 2 through 17 =				\$ 100,552,670
Contingency			10%	\$ 10,055,267
Subtotal - I				\$ 108,607,937
General Conditions	LS		5%	\$ 5,430,397
Mobilization/Demobilization, Bonds & Insurance	LS		6%	\$ 6,516,476
Cash Allowance - Electric Utility Connections	LS			\$ 400,000
Cash Allowance - Gas Line Relocations	LS			\$ 400,000
Cash Allowance - Data Programming	LS			\$ 1,500,000
Cash Allowance - MDOT - TMP	LS			\$ 300,000
Cash Allowance - MDEQ/MDOT Permits and Inspection	LS			\$ 1,500,000
Cash Allowance - RCDC Permit Compliance	LS			\$ 1,500,000
Cash Allowance - Spare Parts	LS			\$ 250,000
Provisionary Allowance - Unforeseen Conditions	LS			\$ 8,750,000
Subtotal - II				\$ 28,446,873
Total Construction Cost (2008)				\$ 236,964,810
Escalation to Mid-Point of Construction			12%	\$ 28,206,577
Total Construction Cost (2011)				\$ 263,281,387

Construction cost estimate does not include CM fee
Contractor's overhead and profit is included in the Unit Cost

Detroit Water and Sewage Department

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The Flint Transmission System Construction Cost Estimate - North Transmission Main - Contract No. 2

Item	Unit	Quantity	Unit Cost	Total Cost
Division 1: GENERAL REQUIREMENTS				
01100 Traffic Control				
Signs	SF	6,650	\$ 25	\$ 166,250
Movable Message Boards	EA	4	\$ 25,000	\$ 100,000
Barricades	FT	16,000	\$ 75	\$ 1,200,000
Cones	EA	2,500	\$ 20	\$ 50,000
Truck-Mounted Attenuator	MO	24	\$ 42,000	\$ 1,008,000
Temporary Roads	SY	42,240	\$ 10	\$ 422,400
01140 Soil Erosion and Sedimentation Control				
Silt Fence	LF	198,000	\$ 5	\$ 990,000
Hay Bales	LF	4,000	\$ 10	\$ 40,000
Subtotal Division 1 =				\$ 3,976,650
Division 2: SITE WORK				
02100 Site Clearing				
Medium Brush	AC	38	\$ 500	\$ 19,000
Light Trees	AC	7	\$ 4,000	\$ 28,000
Topsoil Stripping	CY	7,500	\$ 8	\$ 60,000
02140 Dewatering				
Pumping - Operation	MO	18	\$ 45,000	\$ 810,000
Well Point System - Install/Remove	LF Hdr	60,000	\$ 100	\$ 6,000,000
02221 Trenching, Backfilling and Compacting				
Pavement Sawcutting and Removal	SY	176,000	8	\$ 1,408,000
Pavement Milling	SY	176,000	2	\$ 352,000
Excavation - Pipeline	CY	844,800	\$ 5	\$ 4,224,000
Granular Material	CY	17,500	\$ 30	\$ 525,000
Backfill and Compaction	CY	683,000	\$ 5	\$ 3,415,000
02236 Pipe Boring and Jacking				
Tunnel Casing	LF	2,510	\$ 7,250	\$ 18,197,500
Launching and Receiving Pits	EA	12	\$ 150,000	\$ 1,800,000
Soil Pre-Conditioning	LF	350	\$ 3,500	\$ 1,260,000
Mining Setup	EA	12	\$ 100,000	\$ 1,200,000
Cofferdams	SF	6,600	\$ 40	\$ 264,000
Sheeting	SF	270,000	\$ 40	\$ 10,800,000
02600 Manholes				
6' Dia Manhole	EA	228	\$ 2,500	\$ 570,000
Frame and Cover	EA	276	\$ 500	\$ 138,000
02628 Prestressed Concrete Cylinder Pipe				
PCCP	LF	126,720	\$ 550	\$ 69,696,000
02675 Disinfection of Water Main				
Flushing and Testing	MI	24	\$ 36,000	\$ 864,000
Disinfection	MI	24	\$ 5,000	\$ 120,000
02730 Aggregate Base and Surface Course				
Base Course Drainage Layer	CY	60,150	\$ 100	\$ 6,015,000
02740 Bituminous Paving				
Binder - 2-1/2"	SY	127,750	\$ 10	\$ 1,277,500
Wearing - 1-1/2"	SY	214,250	\$ 6	\$ 1,285,500
02755 - Concrete Curbs, Gutters and Sidewalks				
Concrete Curb and Gutter	LF	13,720	\$ 11	\$ 150,920
02760 - Sidewalks, Sidewalk Ramps and Driveways				
Driveway Replacement - Asphalt	SY	4,000	\$ 9	\$ 36,000
Driveway Replacement - Concrete	SF	4,320	\$ 5	\$ 21,600
02820 - Chain Link Fences and Gates				
Fencing	LF	20,000	\$ 20	\$ 400,000
02900 - Landscaping				
Topsoil	CY	18,338	\$ 20	\$ 366,760
Trees	EA	1,925	\$ 50	\$ 96,250
Grading	SY	440,000	\$ 2	\$ 880,000
Seeding	SY	440,000	\$ 2	\$ 880,000

Detroit Water and Sewage Department

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The Flint Transmission System

Construction Cost Estimate - North Transmission Main - Contract No. 2

Item	Unit	Quantity	Unit Cost	Total Cost
Subtotal Division 2 =				\$ 133,160,030
Division 3: CONCRETE				
Mud Mat	CY	656	\$ 350	\$ 229,600
Floor Slab	CY	1,410	\$ 600	\$ 846,000
Walls	CY	3,828	\$ 600	\$ 2,296,800
Top Slab	CY	1,379	\$ 600	\$ 827,400
Pipe Encasement	CY	2,775	\$ 400	\$ 1,110,000
Subtotal Division 3 =				\$ 6,309,800
Division 5: METALS				
05630 - Access Hatches				
Floor Doors	EA	2	\$ 2,500	\$ 5,000
Subtotal Division 5 =				\$ 5,000
Division 15: MECHANICAL				
15060 - Misc. Piping and Pipe				
Dismantling Joints - 60"	EA	2	\$ 12,000	\$ 24,000
Dismantling Joints - 30"	EA	10	\$ 7,500	\$ 75,000
Wall Sleeves - 48"	EA	4	\$ 7,500	\$ 30,000
48" D.I. Pipe	LF	35	\$ 2,300	\$ 82,800
30" D.I. Pipe	LF	105	\$ 1,500	\$ 157,500
48" x 30" Cross	EA	2	\$ 40,000	\$ 80,000
48" x 30" Reducer	EA	2	\$ 40,000	\$ 80,000
30" x 20" Reducer	EA	12	\$ 30,000	\$ 360,000
30" - 90 Bend	EA	4	\$ 22,000	\$ 88,000
Duplex Sump Pumps	EA	9	\$ 5,000	\$ 45,000
15062 - Steel Pipe				
8" Blowoff	LF	1,200	\$ 60	\$ 72,000
15104 - Metal Seated Gate Valves				
8" Gate Valves - Blowoff	EA	80	\$ 1,000	\$ 80,000
16" Gate Valves - Outlets	EA	6	\$ 10,000	\$ 60,000
30" Gate Valves	EA	4	\$ 50,000	\$ 200,000
48" Gate Valves	EA	4	\$ 100,000	\$ 400,000
60" Gate Valves	EA	24	\$ 275,000	\$ 6,600,000
20" Cone Valves	EA	6	\$ 75,000	\$ 450,000
15108 - Air Release and Combination Air Valves				
Manual Air Release Valves - 1-1/2"	EA	75	\$ 1,000	\$ 75,000
Automatic Air Release Valves - 1"	EA	75	\$ 2,000	\$ 150,000
Combination Air/Vacuum and Air Release - 8"	EA	1	\$ 10,000	\$ 10,000
Piping and Vents	EA	76	\$ 1,500	\$ 114,000
15140 - Pipe Supports				
Concrete Pipe Supports	EA	51	\$ 2,500	\$ 127,500
Subtotal Division 15 =				\$ 9,360,800
Division 16: ELECTRICAL				
PRV Electrical	LS	1	\$ 32,000	\$ 32,000
Vault Electrical	LS	7	\$ 20,000	\$ 140,000
Subtotal Division 16 =				\$ 172,000
Division 17: INSTRUMENTATION AND CONTROLS				
17200 - Computer Systems Hardware				
Hardware, Software	EA	8	\$ 15,000	\$ 120,000
17350 - Multiple Address Radio Equipment				
Remote Telemetry Unit	EA	8	\$ 7,500	\$ 60,000
17520 - Flow Instruments				
Magnetic Flow Meters	EA	2	\$ 75,000	\$ 150,000
17530 - Pressure and Level Instruments				

Detroit Water and Sewage Department
CS-1486
The Flint Transmission System
Construction Cost Estimate - North Transmission Main - Contract No. 2

Item	Unit	Quantity	Unit Cost	Total Cost
Pressure Transmitters	EA	8	\$ 5,000	\$ 40,000
Subtotal Division 17 =				\$ 370,000
Subtotal Division 2 through 17 =				\$ 162,354,280
Contingency			10%	\$ 15,235,428
Subtotal - I				\$ 167,689,708
General Conditions	LS		5%	\$ 8,379,485
Mobilization/Demobilization, Bonds & Insurance	LS		6%	\$ 10,055,382
Cash Allowance - Electric Utility Connections	LS			\$ 400,000
Cash Allowance - Gas Line Relocations	LS			\$ 400,000
Cash Allowance - Data Programming	LS			\$ 1,500,000
Cash Allowance - MDOT - TMP	LS			\$ 300,000
Cash Allowance - MDEQ/MDOT Permits and Inspection	LS			\$ 750,000
Cash Allowance - GCRC Permit Compliance	LS			\$ 1,500,000
Cash Allowance - Spare Parts	LS			\$ 250,000
Provisionary Allowance - Unforeseen Conditions	LS			\$ 8,750,000
Subtotal - II				\$ 32,284,868
Total Construction Cost (2008)				\$ 199,874,576
Escalation to Mid-Point of Construction			12%	\$ 23,984,949
Total Construction Cost (2011)				\$ 223,859,525

Construction cost estimate does not include CM fee
Contractor's overhead and profit is included in the Unit Cost

Detroit Water and Sewage Department
CS-1486
The Flint Transmission System
Construction Cost Estimate - Grand Blanc Pumping Station

Item	Unit	Quantity	Unit Cost	Total Cost
Division 1: GENERAL REQUIREMENTS				
01100 Traffic Control				
Maintaining Traffic allowance	LS	1	\$ 35,000	\$ 35,000
01140 Soil Erosion and Sedimentation Control				
Construction Entrance	LS	1	\$ 5,000	\$ 5,000
Silt Fence	LF	5,000	\$ 1	\$ 5,000
Subtotal Division 1 =				\$ 45,000
Division 2: SITE WORK				
02200 Earthwork and Backfill				
Excavation for Pumping Station	CY	7,650	\$ 16	\$ 122,400
Backfill for Pumping Station	CY	2,500	\$ 20	\$ 50,000
02012 Soil Boring and Testing	LS	1	\$ 10,000	\$ 10,000
02050 Demolition	LS	1	\$ 10,000	\$ 10,000
02100 Site Cleaning				
Clear brush, trees	LS	1	\$ 20,000	\$ 20,000
topsoil, strip and stack	cy	5,000	\$ 10	\$ 50,000
02140 Dewatering				
Well Points & Pumping	LS	1	\$ 50,000	\$ 50,000
02221 Trenching, Backfilling and Compacting				
Undercut unstable soil allowance	LS	800	\$ 7	\$ 5,600
Structural fill	CY	3,000	\$ 30	\$ 90,000
02530 Sanitary sewers				
8" dia San	LF	2,500	\$ 40	\$ 100,000
02600 Manholes	Each	7	\$ 2,500	\$ 17,500
02628 Water Main				
72-inch Suction and Discharge lines	LF	1,200	\$ 750	\$ 900,000
60-inch Gate Valves	Each	3	\$ 275,000	\$ 825,000
8-inch Gate Valve (Blow-off)	Each	2	\$ 1,000	\$ 2,000
8-inch water	LF	2,000	\$ 60	\$ 120,000
Hydrant	Each	2	\$ 3,000	\$ 6,000
02630 Storm Drainage & Pipe Culverts				
12" dia Storm	LF	1,000	\$ 40	\$ 40,000
15" dia Storm	LF	400	\$ 50	\$ 20,000
Culvert	LF	40	\$ 25	\$ 1,000
Manholes and catch basins	Each	7	\$ 2,000	\$ 14,000
Detention Basin	Each	1	\$ 25,000	\$ 25,000
02640 Natural Gas	LS	1	\$ 8,000	\$ 8,000
02740 Bituminous Paving	SY	8,000	\$ 38	\$ 304,000
02750 Concrete Pavement	SY	3,000	\$ 60	\$ 180,000
02760 Sidewalks, Sidewalks & Driveways				
Curb and Gutter	LF	3,000	\$ 16	\$ 48,000
Granular Material	cy	4,000	\$ 20	\$ 80,000
Backfill and Compaction	cy	3,000	\$ 12	\$ 36,000
02820 Chainlink Fence and Gates				
8' high security fence w/ barbed wire	LF	3,600	\$ 53	\$ 190,800
Cattlelever sliding gates, motorized	Each	1	\$ 18,000	\$ 18,000
02900 Landscaping				
Topsoil	CY	4,000	\$ 20	\$ 80,000
Grading	SY	20,000	\$ 2	\$ 40,000
Seeding	SY	12,000	\$ 2	\$ 24,000
Trees & Shrubs	LS	1	\$ 15,000	\$ 15,000
General Contractor's Mark-up (10%)	LS	1	\$ 350,230	\$ 350,230
Subtotal Division 2 =				\$ - 3,852,530
Division 3: CONCRETE				
Pumping Station				

Detroit Water and Sewage Department
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The Flint Transmission System
Construction Cost Estimate - Grand Blanc Pumping Station

Foundation	CY	1,213	\$	300	\$	363,900
Walls (East & West)	CY	100	\$	400	\$	40,000
Walls (North & South)	CY	29	\$	400	\$	11,600
Flow Meter Vault Walls (East & West)	CY	13	\$	400	\$	5,200
Flow Meter Vault Walls (North & South)	CY	9	\$	400	\$	3,600
Vault Walls (East & West)	CY	19	\$	400	\$	7,600
Vault Walls (North & South)	CY	14	\$	400	\$	5,600
Footings (East & West)	CY	225	\$	300	\$	67,500
Footings (North & South)	CY	65	\$	300	\$	19,500
Column Pillasters	CY	21	\$	750	\$	15,750
Column Pillasters Foundation	CY	24	\$	750	\$	18,000
Vaults for 60-inch Gate Valves						
Walls (East & West)	CY	150	\$	400	\$	60,000
Walls (North & South)	CY	100	\$	400	\$	40,000
Floor (Roof Plan)	CY	100	\$	300	\$	30,000
Floor (Floor Plan)	CY	17	\$	300	\$	5,100
Slab	CY	25	\$	500	\$	12,500
72" Pipe Encasement						
Concrete	CY	529	\$	400	\$	211,600
Pipe Encasement	CY	12	\$	400	\$	4,800
Electrical Room						
AHU Concrete Pad (Typ of 4)	CY	11	\$	400	\$	4,400
VFD Concrete Pad (Typ of 5)	CY	8	\$	400	\$	3,200
Double Ended Substation Concrete Support Pad (Typ)	CY	3	\$	400	\$	1,200
Primary Switch Gear Concrete Support Pad (Typ)	CY	5	\$	400	\$	2,000
6" Hollowcore (Office/Restroom Roof)	SF	250	\$	32	\$	8,000
Pump Room						
Valve Support Concrete Pad (Typ of 5) (Motor)	CY	5	\$	400	\$	2,000
Valve Support Concrete Pad (Typ of 5) (Pump)	CY	7	\$	400	\$	2,800
Valve Support Concrete Support Pad (Typ of 5)	CY	3	\$	400	\$	1,200
Valve Support Concrete Support Pad (Typ of 5)	CY	2	\$	400	\$	800
Valve Support Concrete Support Pad (Typ of 10)	CY	1	\$	400	\$	400
Thrust Restraint	CY	333	\$	400	\$	133,200
Subtotal Division 3 =					\$	1,081,450
Division 4: MASONRY						
Exterior Masonry Wall (12" CMU, 4" face brick, cavity,	SF	16,950	\$	38	\$	644,100
12" interior masonry walls (Sound and Burnished block)	SF	4,050	\$	25	\$	101,250
8" interior masonry walls (Burnished Block)	SF	638	\$	22	\$	14,036
Subtotal Division 4 =					\$	759,386
Division 5: METALS						
W14x90	LF	2,160	\$	140	\$	302,400
W12x40	LF	150	\$	60	\$	9,600
Cross Brace (2L3 1/2 x 3x 1/2)	LF	320	\$	50	\$	16,000
W6x15	LF	45	\$	35	\$	1,575
W10x33	LF	99	\$	60	\$	5,940
2DLH09 Steel Joists	LF	1,295	\$	30	\$	38,850
Engineered Steel Truss	LF	3,240	\$	100	\$	324,000
Cross Bracing (L6x3 1/2 x 1/2)	LF	588	\$	35	\$	24,080
3" Metal Decking	SF	13,200	\$	20	\$	264,000
2" Metal Decking	SF	7,500	\$	15	\$	112,500
Grating						
Removable St. Grating (Pump Room)	SF	930	\$	30	\$	27,900
Aluminum Grating (Valve Vault) - (Typ of 3)	SF	27	\$	30	\$	810
Removable painted St. Handrail (around removable	LF	150	\$	55	\$	8,250
Painted steel railing (Stairways)	LF	40	\$	55	\$	2,200
Metal stair (2 stairs)	Riser	40	\$	550	\$	22,000

Detroit Water and Sewage Department
CS-1486
The Flint Transmission System
Construction Cost Estimate - Grand Blanc Pumping Station

				Subtotal Division 5 =	\$ 1,160,105
Division 6: WOOD AND PLASTIC					
Rough carpentry	LS	1	\$ 9,200	\$	9,200
				Subtotal Division 6 =	\$ 9,200
Division 7: THERMAL AND MOISTURE PROTECTION					
Built Up Roofing	SF	7,700	\$ 9	\$	69,300
Standing seam roofing	SF	16,900	\$ 14	\$	236,600
				Subtotal Division 7 =	\$ 236,600
Division 8: DOORS AND WINDOWS					
Exterior HM doors	EA	6	\$ 2,530	\$	15,180
Interior HM doors	EA	4	\$ 1,840	\$	7,360
Overhead Door	EA	2	\$ 11,200	\$	22,400
Aluminum Windows	SF	98	\$ 50	\$	4,900
Translucent Panels	SF	996	\$ 45	\$	44,820
				Subtotal Division 8 =	\$ 94,660
Division 9: FINISHES					
Painting					
				Subtotal Division 9 =	\$ 337,262
Division 10: SPECIALTIES					
Louvers	LS	1	30,000	\$	30,000
xx	x	0	\$ -	\$	-
				Subtotal Division 11 =	\$ -
Division 12: FURNISHINGS					
Control room furniture	LS	1	\$ 3,450	\$	3,450
				Subtotal Division 12 =	\$ 3,450
Division 13: SPECIAL CONSTRUCTION					
xx	x	0	\$ -	\$	-
				Subtotal Division 13 =	\$ -
Division 14: CONVEYING SYSTEMS					
15 Ton Crane 60' Span	LS	1	\$ 265,810	\$	265,810
				Subtotal Division 14 =	\$ 265,810
Division 15: MECHANICAL					
Pumps - w/2250 HP Motors and VFD's	each	5	\$ 1,410,000	\$	7,050,000
30 inch Piping	lf	200	\$ 1,200	\$	240,000
30 inch 90° Bends	each	10	\$ 22,000	\$	220,000
30 inch Coupling	each	10	\$ 6,300	\$	63,000
30 inch Gate Valve w/Manual Operator	each	10	\$ 115,000	\$	1,150,000
20 inch Cone Valve w/EH Operator	each	5	\$ 135,000	\$	675,000
72 inch Header Piping	lf	520	\$ 3,000	\$	1,560,000
72 inch Tees	each	12	\$ 114,000	\$	1,368,000
72 inch 90° Bends	each	2	\$ 90,000	\$	180,000
Magnetic Flow Meter	each	1	\$ 57,000	\$	57,000
72 & 60 inch Bypass Piping	lf	100	\$ 1,450	\$	145,000
48" Gate Valve w/Manual Operator	each	2	\$ 167,500	\$	335,000
36 inch Cone Valve w/EH Operator	each	1	\$ 305,000	\$	305,000
72 inch Couplings	each	4	\$ 6,900	\$	27,600
Supply Water System	each	1	\$ 54,000	\$	54,000
Drain Pumping Station (Interior)	each	1	\$ 25,200	\$	25,200
Air/Vacuum Relief Valves	each	10	\$ 1,500	\$	15,000
Plumbing	s.f	18,000	\$ 20	\$	360,000

Detroit Water and Sewage Department
CS-1486
The Flint Transmission System
Construction Cost Estimate - Grand Blanc Pumping Station

Mechanical Start-up, Testing and Disinfection	each	1	\$ 100,000	\$ 100,000
HVAC	s.f	18,000	\$ 35	\$ 630,000
General Contractor's Mark-up (10%)	LS	1	\$ 1,455,980	\$ 1,455,980
Subtotal Division 15 =				\$ 16,015,780
Division 16: ELECTRICAL				
15 KV Metal Enclosed Switchgear W/DTE Meter	Each	1	\$ 80,000	\$ 80,000
Primary Power Transformer	Each	1	\$ 850,000	\$ 850,000
Neutral Grounding Resistor	Each	1	\$ 50,000	\$ 50,000
5 KV Metal Clad Switchgear Lineup	Each	1	\$ 850,000	\$ 850,000
Distribution Equipment	LS	1	\$ 250,000	\$ 250,000
Lighting System	LS	1	\$ 125,000	\$ 125,000
Grounding - Building & Equipment	LS	1	\$ 50,000	\$ 50,000
MV Cables	LS	1	\$ 75,000	\$ 75,000
Wiring and Control Devices	LS	1	\$ 50,000	\$ 50,000
Cable and Wires	LS	1	\$ 150,000	\$ 150,000
Installation	LS	1	\$ 1,155,250	\$ 1,155,250
Startup, testing and training	LS	1	\$ 150,000	\$ 150,000
Short Circuit & Coordination Study	LS	1	\$ 75,000	\$ 75,000
Gate/Card Access	LS	1	\$ 11,000	\$ 11,000
Network Video Recorder and Cameras	LS	1	\$ 13,000	\$ 13,000
Interior Motion/door contracts	LS	1	\$ 10,000	\$ 10,000
Documentation and Manuals	LS	1	\$ 55,000	\$ 55,000
General Contractor's Mark-up (10%)	LS	1	\$ 399,925	\$ 399,925
Subtotal Division 16 =				\$ 4,399,175
Division 17: INSTRUMENTATION AND CONTROLS				
Control System - with Remote Operator Station (ROS)	LS	1	\$ 450,000	\$ 450,000
Radio System	LS	1	\$ 53,000	\$ 53,000
Field Instruments- Flow, Pressure, etc	LS	1	\$ 59,400	\$ 59,400
Programming - Control System including upgrade to SOC	LS	1	\$ 57,500	\$ 57,500
Start-up/Phase-over and Testing	LS	1	\$ 140,000	\$ 140,000
Documentation and Manuals	LS	1	\$ 45,000	\$ 45,000
Network/Communication Equipment	LS	1	\$ 19,800	\$ 19,800
General Contractor's Mark-up (10%)	LS	1	\$ 82,470	\$ 82,470
Subtotal Division 17 =				\$ 907,170
Subtotal Division 2 through 17 =				\$ 29,171,593
Contingency			10%	\$ 2,917,159
Subtotal - I				\$ 32,088,752
General Conditions	1		5%	\$ 1,604,438
Mobilization/Demobilization, Bonds & Insurance	1		8%	\$ 1,925,325
Allowance for Primary Feed To Station	LS		\$ 2,000,000	\$ 2,000,000
Provisionary Allowance - Unforeseen Conditions	1		10%	\$ 3,208,875
Subtotal - II				\$ 8,738,638
Total Construction Cost (2008)				\$ 40,827,390
Escalation to Mid-Point of Construction			12%	\$ 4,899,287
Total Construction Cost (2011)				\$ 45,726,677

Construction cost estimate does not include CM fee
Contractor's overhead and profit is included in the Unit Cost

Form No. DTMB-3522 (Rev. 4/2012)
 AUTHORITY Act 431 of 1984
 COMPLETION Required
 PENALTY Contract will not be executed unless form is filed

STATE OF MICHIGAN
 DEPARTMENT OF TREASURY
 PURCHASING
 P.O. BOX 30791, LANSING, MI 48909
 OR
 430 W. ALLEGAN, LANSING, MI 48933

NOTICE OF CONTRACT NO. 271N3200089
 between
THE STATE OF MICHIGAN
 and

NAME & ADDRESS OF CONTRACTOR:	PRIMARY CONTACT	EMAIL
Tucker, Young, Jackson, Tull, Inc. 565 East Larned, Suite 300 Detroit, Michigan 48226	George Y Karmo, BCEE, P.E	gkarmo@tyjt.com
	TELEPHONE	CONTRACTOR #, MAIL CODE
	313-963-0612	On-file

STATE CONTACTS	AGENCY	NAME	PHONE	EMAIL
CONTRACT COMPLIANCE INSPECTOR:	Treasury	Eric Cline	517-373-4415	cliner1@michigan.gov
BUYER:	Treasury	Thomas Falik	517-373-3185	falikt@michigan.gov

CONTRACT SUMMARY:			
DESCRIPTION:			
Municipal Water Supply Assessment			
INITIAL TERM	EFFECTIVE DATE	INITIAL EXPIRATION DATE	AVAILABLE OPTIONS
Two Months	11/28/2012	01/31/2013	0
PAYMENT TERMS	F.O.B	SHIPPED	SHIPPED FROM
NET30	Destination	N/A	N/A
ALTERNATE PAYMENT OPTIONS:			AVAILABLE TO MIDEAL PARTICIPANTS
☐ P-card ☐ Direct Voucher (DV) ☐ Other			☐ YES ☒ NO
MINIMUM DELIVERY REQUIREMENTS:			
N/A			
MISCELLANEOUS INFORMATION:			
The terms and conditions of Indefinite-Scope, Indefinite-Delivery Contract No. 00383 (Discretionary Contract Number 00263), Statement of Work (SOW) #271Q3209 and clarification dated November 21, 2012 apply to this Contract.			
CONTRACT VALUE:		\$39,500.00	

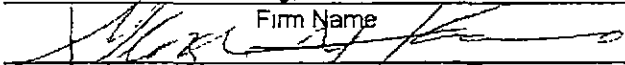
This Contract Agreement is awarded on the basis of our inquiry bearing solicitation #271Q3208.

Notice of Contract #: 271N3200089

FOR THE CONTRACTOR:

Tucker, Young, Jackson, Tull, Inc.

Firm Name



Authorized Agent Signature

GEORGE Y. KARMO

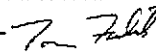
Authorized Agent (Print or Type)

11-28-2012

Date

FOR THE STATE:

Digitally signed by Thomas Falik
DN: cn=Thomas Falik, o=Department of
Treasury, ou=Purchasing, email=thomas.falik@treasury.gov



State

Thomas Falik/Purchasing Manager

Name/Title

Department of Treasury

Enter Name of Agency

11-28-12

Date



Article 1 – Statement of Work (SOW)

Note to Contractors: Proposals must include detailed responses to all tasks as requested in Article 1. Contractors should provide thorough responses to each task, or, when appropriate, state their agreement that the Contractor will provide the requested services. Contractors are encouraged to provide detailed responses in order to allow the State to fully evaluate the Contractor's capabilities.

Throughout this SOW, language referring to Contract or Contractor(s) refers to any Contract awarded from this SOW. This SOW in itself is not to be construed as a Contract.

1.010 Project Identification

1.011 Project Request

This is an SOW for a Municipal Water Supply Assessment on behalf of the Department of Treasury and the City of Flint in Genesee County. This is a formal request to prospective Contractors to solicit bids or price quotations. Contractors must submit written proposals according to the instructions contained within this document, discussing how they will meet the specific requirements

Any awarded Purchase Order(s) between the State and any awarded Contractor(s) is a separate document, whose terms are limited by the Contract.

1.012 Background

The Treasury Department is charged with monitoring, oversight and provision of assistance to local units of government under various statutes, including but not limited to, the Home Rule City Act (Act 279 of 1909), the Uniform Budgeting and Accounting Act (Act 2 of 1968), and the Glenn Steil State Revenue Sharing Act (Act 140 of 1971). In providing such monitoring and assistance to local units of government, the Treasury Department strives to preserve the capacity of local units to provide those services essential to the public health, safety and welfare of the citizens of this State.

The City of Flint is currently supplied potable water from the Detroit Water and Sewerage Department (DWSD). This supply is provided through a single 72-inch water main that terminates at a master meter. The City of Flint's water treatment plant uses the Flint River as a back-up and redundancy supply source to the DWSD supply, as required by the Michigan Department of Environmental Quality (MDEQ). The City of Flint also provides potable water to Genesee County downstream of the DWSD master meter.

The newly formed Karegnondi Water Authority (KWA) plans to construct a raw water supply system that will feed Flint's water treatment plant with water directly from Lake Huron. The Flint water treatment plant could be upgraded to accommodate and treat this new raw water source. DWSD has also proposed alternatives to the existing agreement with the City of Flint that could also be pursued.

A Contractor is needed to provide services to the Department of Treasury and the City of Flint upon request of the Treasury Department. The Department of Treasury is requesting a Contractor provide an analysis of the water supply options for the City of Flint to assist the Department of Treasury and the City of Flint in determining the best available option.

1.020 Scope of Work and Deliverables

1.021 In Scope



The Contractor must provide Water Supply Assessment as requested by the Department of Treasury. These services will include data collection and review, an engineering evaluation and the generation of recommendations.

Bidder Response:

Agreed; our attached Sample Project Plan describes our approach for these services

1.022 Work and Deliverable

Contractor must provide Deliverables/Services and staff, and otherwise do all things necessary for or incidental to the performance of work, as set forth below

A. Data Collection and Review:

1. Provide all labor, materials and equipment to fully perform the work of data collection and review for an assessment of water supply options for the City of Flint

Bidder Response:

Our Price Proposal in Attachment A includes all labor, materials and equipment to perform the base work described in our Sample Project Plan.

2. Perform an analysis and comparison of the KWA and DWSD proposals that includes all capital, financing, operational and maintenance costs.

Bidder Response:

Agreed, our attached Sample Project Plan describes our approach for these services.

3. Prepare and submit for Department of Treasury and City of Flint review a preliminary report on the findings by Thursday, December 20, 2012; additionally, a final inspection report of findings and recommendations must be presented no later than January 8, 2013 (also see Section 1.022.E).

Bidder Response:

Agreed, however, meeting these dates are predicated on receiving a notice to proceed from the Treasury Department by November 26, 2012

B Data collection and analysis services must include the following:

1. DWSD's proposed contract with the City of Flint

Bidder Response:

Agreed, this is included in our attached Sample Project Plan

2. DWSD's proposed water rates with the City of Flint

Bidder Response:

Agreed, this is included in our attached Sample Project Plan.



3. Other relevant DWSD documents or information regarding the provision of municipal water to the City of Flint

Bidder Response:

Agreed

4. KWA's proposed contract with the City of Flint

Bidder Response:

Agreed, this is included in our attached Sample Project Plan

- 5 Any engineering or environmental reports that evaluate KWA's proposal to provide municipal water to the City of Flint.

Bidder Response:

Agreed

- 6 Other relevant KWA documents or information regarding the provision of municipal water to the City of Flint

Bidder Response:

Agreed

C Engineering Evaluation:

- 1 Evaluation and recommendation of a potential water supply for the City of Flint must be based upon: 1) Cost; 2) System redundancy and reliability; and 3) The capacity for the Flint River to supply all of the City of Flint's water needs

Bidder Response

Agreed, this is included in our attached Sample Project Plan.

- 2 Evaluation and recommendation of a potential water supply for the City of Flint will also be based upon any additional criteria mutually agreed upon by the Department of Treasury, the City of Flint and the Contractor.

Bidder Response.

Agreed

- D The Contractor must carry out its operations in strict accordance with local, state, federal regulations.

Bidder Response.

Agreed.

- E. Provide electronic copies (in the most suitable format) of the final inspection report of findings and recommendations to the City of Flint and the Department of Treasury, Office of Fiscal Responsibility by January 8, 2013:



Bidder Response:

Agreed

1. Describe format of findings and recommendations. Format should also include a description of all work performed.

Bidder Response

Our attached Sample Project Plan describes our approach for the findings and recommendations. TYJT will draft a report for the Treasurer that identifies the information collected, the analysis process, our findings, and the recommendations made. Our recommendations will be based on the risks to Flint associated with the options identified.

- a) Preliminary inspection report of findings and recommendations must be presented by December 20, 2012

Bidder Response

Agreed, this is included in our attached Sample Project Plan and the date is predicated on receiving a notice to proceed from the Treasury Department by November 26, 2012

- b) Final inspection report of findings and recommendations must be presented no later than January 8, 2013

Bidder Response

Agreed, this is included in our attached Sample Project Plan and the date is predicated on receiving a notice to proceed from the Treasury Department by November 26, 2012

2. Describe electronic formats available

Bidder Response.

Document formats would include PDF's or in their initial format (Word, Excel, GIS/CAD, etc.).

- F. Submit findings and recommendations to an independent Quality Control and Quality Assurance (QA/QC) review process for validation

Bidder Response

Agreed; the independent QA/QC approach is included in our attached Sample Project Plan.

1. Provide electronic copies (in the most suitable format) of the independent QA/QC review to the City of Flint and the Department of Treasury, Office of Fiscal Responsibility by January 8, 2013, with the final inspection report.

Bidder Response

Agreed, however, meeting this date are predicated on receiving a notice to proceed from the Treasury Department by November 26, 2012.

1.030 Roles and Responsibilities

1.031 Contractor Staff, Roles, and Responsibilities



1. Contractor must identify staff who will be involved in the project, including the name of each individual, work locations, and detailed descriptions of their roles and responsibilities.

Note: If an overall organization chart has been developed, provide a reference to that chart as well
Note any part-time personnel.

Bidder Response:

The staff will be comprised of our senior management. Messrs. David Guastella and Awni Qaqish. Also, we will be supported by our part-time staff member, former Finance Director of Redford. Their roles will include meeting with Flint, KWA, and DWSD; estimating capital costs of all options; estimating all operation and maintenance costs of all options, a financial analysis for funding capital; and all other issues related to the costs of service.

2. Specific work schedules for this project are Monday through Friday, 8:00 a.m. to 5:00 p.m. Eastern Time; however, possible night and weekend hours may be required.

Bidder Response:

Agreed

1.032 State Staff, Roles, and Responsibilities

1. Contract Compliance Inspector (CCI). The State's CCI provides oversight and monitoring of the selected Contractor's adherence to the terms and conditions of this project and the Contract.
2. Project Manager: The State's Project Manager will monitor the project activities

1.040 Project Plan

1.041 Project Plan Management

1. The Contractor will carry out this project under the direction and control of the CCI or designee.
2. Although there will be continuous liaison with the Contractor team, the CCI or designee will meet quarterly as a minimum, or as requested by the CCI or designee, with the Contractor's Project Manager for the purpose of reviewing progress and providing necessary guidance to the Contractor in solving problems which arise
3. Contractors must provide a sample project plan with proposal for the deliverables proposed in section 1.022. The plan must include the details noted in section 1.041.4.

Contractor Response

Agreed, the Sample Project Plan is attached.

4. Within five working days of Contract or purchase order award, the Contractor must submit to the CCI or designee for final approval a detailed project plan. This final project plan must be in agreement with the Contractor's proposal and accepted by the State for Contract, and must include the following:
 - a. The Contractor's project organizational structure
 - b. The Contractor's staffing table with names and title of personnel assigned to the project. This must be in agreement with staffing of accepted proposal. Necessary substitutions



due to change of employment status and other unforeseen circumstances may only be made with prior approval of the State.

- c. The project breakdown showing sub-projects, activities and tasks, and resources required and allocated to each (e.g., estimated levels of effort for each level of personnel for Contractor personnel, including any contractual employees, and State personnel)

1.042 Reports

1. The Contractor must submit written bi-weekly summaries of progress which outline the work accomplished during the reporting period; work to be accomplished during the subsequent reporting period; problems, real or anticipated, which should be brought to the attention of the CCI; and notification of any significant deviation from previously agreed-upon work plans

1.050 Acceptance – Deleted – N/A

1.060 Proposal Pricing

1.061 Proposal Pricing

1. For authorized Services and Price List, see Attachment A (Price Proposal). Please complete Attachment A and submit with proposal.
2. Bidders are encouraged to offer quick payment terms (i.e. 0% discount off invoice if paid within _____ days) This information can be noted on the Bidders price proposal (see Attachment A). This may be a factor considered in the award decision.
3. Contractor's out-of-pocket expenses are not separately reimbursable by the State or local unit of government unless, on a case-by-case basis for unusual expenses, the State has agreed in advance and in writing to reimburse Contractor for the expense at the State's current travel reimbursement rates. See www.michigan.gov/dtmb for current rates.
4. Invoicing and payment must occur per Article 2 (Compensation) of Indefinite Scope Indefinite Delivery Contract No. 263 (Discretionary Contract Number 00263) and Attachment A

1.070 Additional Requirements – Deleted – N/A



Attachment A, Price Proposal

Bidders are encouraged to offer quick payment terms (i.e. 0% discount off invoice if paid within days). This information can be noted on the price proposal. This may be a factor considered in the award decision.

Provide the price per deliverable for the proposed services in section 1.022.	
Deliverable	Price
A <u>Municipal Water Supply Assessment</u>	
1. Data Collection and Review	\$ 6,500
2. Engineering Evaluation	\$ 30,000
3. Provide Copies of Findings and Review Findings	\$ 3,000
Grand Total	\$ 39,500
B <u>Optional Services</u>	
1.	\$
2.	\$
3.	\$
4.	\$
5.	\$



**Indefinite-scope, Indefinite-delivery Contract Number 00383
2012 Professional General Architectural/Engineering Services**

**CITY OF FLINT WATER SUPPLY ASSESSMENT
SAMPLE PROJECT PLAN**

November 2012

1. Scope of Work

Tucker, Young, Jackson, Tull, Inc. (TYJT), at the request of the State Treasurer is providing a proposal to perform an analysis of the water supply options being considered by the City of Flint. The work would be completed as an authorized task under the reference contract, Contract No. 00383. This proposal provides a background of our understanding of the issues, our approach, schedule dates, and the level of effort to perform the task.

2. Background

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's 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 the best course going forward for the City of Flint.

3. Scope of Work

The proposed scope of work summarizes TYJT's approach to perform the analysis. The work includes data collection and review, an engineering evaluation, and recommendations. The recommendations would be provided in a report that would also include a description of all the work performed under this task.

3.1. Data Collection and Review

To perform an analysis of competing proposals it is important to provide a relative or "apples-to-apples" comparison. As example, DWSD's cost of service includes all capital, financing, and operation and maintenance costs to deliver the water to Flint's system. Therefore, it will be necessary for an assessment of KWA's proposal to also include all of these costs in the comparison.

Additionally, DWSD is proposing other alternatives to its existing agreement with Flint that will also need to be evaluated. The options currently proposed include:



- Using DWSD's new model contract that provides reduction in cost for communities with their own storage,
- Moving the location of supply from Potter and Baxter to the Imlay Pumping Station to reduce fees associated with elevation and distance from DWSD's water plants,
- Providing finished (potable) non-pumped water from the Lake Huron Water Treatment Plant, and
- Providing raw (not treated) non-pumped water from the Lake Huron Water Treatment Plant.

This phase of the work would include the collection and review of the following documents:

- The Lake Huron Water Supply Karegnondi Water Authority Preliminary Engineering Report, dated September 2009 and the 2012 update by Rowe Engineering,
- The Analysis of the Flint River as a Permanent Water Supply for the City of Flint Report, dated July 2011;
- Proposed or draft contract agreements that would be used between the KWA and the City of Flint;
- DWSD's contract rates based on the new model contracts;
- Information related to other DWSD proposals for service to Flint; and
- Other letters, minutes, etc. from all parties that provide information that could be used in the evaluation

All information provided would be evaluated and subsequent meetings would be held with the DWSD, Flint and the KWA to address any data gaps or clarifications that may be required. These meetings would be coordinated with the Treasurer so that its representatives can be present at the meetings. For the purpose of this proposal, TYJT has assumed a total of two meetings for both the DWSD and KWA.

3.2. Engineering Evaluation

The City of Flint Emergency Financial Manager has indicated that he believes the determination of who supplies water to the City's system should mainly be based on the following criteria (in order of importance).

- Cost,
- System redundancy/reliability, and
- The recognized limitation of the Flint River as a source to supplying all of Flint's water needs.

In consultation with the Treasurer, these factors plus additional ones that may be identified in the evaluation process would be used.

An analysis will be performed for the options identified and a comparison will be made based on cost, reliability of supply, and any limitations that may identified by both suppliers in providing the needed service.



TYJT will draft a report for the Treasurer that identifies the information collected, the analysis process, our findings, and the recommendations made. Our recommendations will be based on the risks to Flint associated with the options identified. TYJT will then incorporate comments from the Treasury's review and submit a final document to the Department of Treasury for their use.

Furthermore, as is done as a standard of practice at TYJT for quality control and quality assurance (QA/QC), an independent review will be completed by staff or outside consultants not directly involved in the project. These reviewers will have noted experience in the field necessary to complete the QA/QC reviews. Two reviews are envisioned; one to review the evaluation process and the other to review the findings and recommendations

4. Schedule

At the meeting between all interested parties on November 1, 2012, two dates were identified by the Treasurer. The first date identified was December 20, 2012 for the preliminary evaluation to be provided to the State. The second date was January 15, 2013 for the Treasury to make a decision on the City of Flint water supply. TYJT proposes to complete the draft report for submittal on December 20th. This will provide a two week review period by the Treasury. The final report would then be completed and submitted one week prior to the January 15th deadline. TYJT will also be available, if requested by the Treasurer, to attend a general meeting with all parties involved at the conclusion of the work.

**Indefinite-scope, Indefinite-delivery Contract Number 00383
2012 Professional General Architectural/Engineering Services**

CITY OF FLINT WATER SUPPLY ASSESSMENT

November 2012

1. Scope of Work

Tucker, Young, Jackson, Tull, Inc. (TYJT), at the request of the State Treasurer is providing a proposal to perform an analysis of the water supply options being considered by the City of Flint. The work would be completed as an authorized task under the reference contract, Contract No. 00383. This proposal provides a background of our understanding of the issues, our approach, schedule dates, and the level of effort to perform the task.

2. Background

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's 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 the best course going forward for the City of Flint.

3. Scope of Work

The proposed scope of work summarizes TYJT's approach to perform the analysis. The work includes data collection and review, an engineering evaluation, and recommendations. The recommendations would be provided in a report that would also include a description of all the work performed under this task.

3.1. Data Collection and Review

To perform an analysis of competing proposals it is important to provide a relative or "apples-to-apples" comparison. As example, DWSD's cost of service includes all capital, financing, and operation and maintenance costs to deliver the water to Flint's system. Therefore, it will be necessary for an assessment of KWA's proposal to also include all of these costs in the comparison.

Additionally, DWSD is proposing other alternatives to its existing agreement with Flint that will also need to be evaluated. The options currently proposed include:

- Using DWSD's new model contract that provides reduction in cost for communities with their own storage,
- Moving the location of supply from Potter and Baxter to the Imlay Pumping Station to reduce fees associated with elevation and distance from DWSD's water plants,
- Providing finished (potable) non-pumped water from the Lake Huron Water Treatment Plant, and
- Providing raw (not treated) non-pumped water from the Lake Huron Water Treatment Plant

This phase of the work would include the collection and review of the following documents:

- The Lake Huron Water Supply Karegnondi Water Authority Preliminary Engineering Report, dated September 2009 and the 2012 update by Rowe Engineering;
- The Analysis of the Flint River as a Permanent Water Supply for the City of Flint Report, dated July 2011;
- Proposed or draft contract agreements that would be used between the KWA and the City of Flint,
- DWSD's contract rates based on the new model contracts;
- Information related to other DWSD proposals for service to Flint, and
- Other letters, minutes, etc. from all parties that provide information that could be used in the evaluation.

All information provided would be evaluated and subsequent meetings would be held with the DWSD, Flint and the KWA to address any data gaps or clarifications that may be required. These meetings would be coordinated with the Treasurer so that its representatives can be present at the meetings. For the purpose of this proposal, TYJT has assumed a total of two meetings for both the DWSD and KWA.

3.2. Engineering Evaluation

The City of Flint Emergency Financial Manager has indicated that he believes the determination of who supplies water to the City's system should mainly be based on the following criteria (in order of importance)

- Cost,
- System redundancy/reliability, and
- The recognized limitation of the Flint River as a source to supplying all of Flint's water needs

In consultation with the Treasurer, these factors plus additional ones that may be identified in the evaluation process would be used.

An analysis will be performed for the options identified and a comparison will be made based on cost, reliability of supply, and any limitations that may identified by both suppliers in providing the needed service.

TYJT will draft a report for the Treasurer that identifies the information collected, the analysis process, our findings, and the recommendations made. Our recommendations will be based on the risks to Flint associated with the options identified. TYJT will then incorporate comments from the Treasury's review and submit a final document to the Department of Treasury for their use

Furthermore, as is done as a standard of practice at TYJT for quality control and quality assurance (QA/QC), an independent review will be completed by staff or outside consultants not directly involved in the project. These reviewers will have noted experience in the field necessary to complete the QA/QC reviews. Two reviews are envisioned; one to review the evaluation process and the other to review the findings and recommendations.

4. Schedule

At the meeting between all interested parties on November 1, 2012, two dates were identified by the Treasurer. The first date identified was December 20, 2012 for the preliminary evaluation to be provided to the State. The second date was January 15, 2013 for the Treasury to make a decision on the City of Flint water supply. TYJT proposes to complete the draft report for submittal on December 20th. This will provide a two week review period by the Treasury. The final report would then be completed and submitted one week prior to the January 15th deadline. TYJT will also be available, if requested by the Treasurer, to attend a general meeting with all parties involved at the conclusion of the work.

5. Level of Effort and Cost

TYJT estimates the level of effort to be \$39,500. The work would be billed on a time and material basis using the rates in the reference contract, Contract No 00383

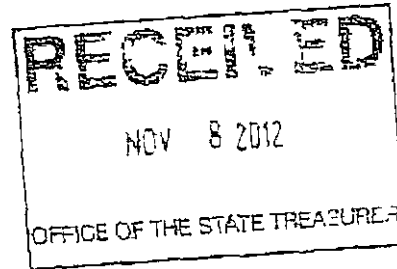


Edward J. Kertiz
Emergency Financial Manager

Dayne Walling
Mayor

November 6, 2012

Mr. Andy Dillon, Treasurer
Michigan Department of Treasury
430 W. Allegan Street
Lansing, MI 48922



Dear Treasurer Dillon

First, thank you for giving us the opportunity to present our plan for the "Flint Water Supply Future" with you. We have already had initial contact with DWSD about scheduling meetings as well as what information is needed by them to make a proposal to us. Our understanding from the meeting is that DWSD needs to make a proposal to us for consideration along with the KWA proposal by the 20th of December. We would then make a recommendation to you for the Governor's consideration. A final recommendation will be made by the Governor's office by January 15, 2013.

I assure you, that we will work diligently with DWSD to provide them with whatever they need, so they can meet that deadline. We will give serious consideration to their proposal.

As I stated at the meeting, I am not an advocate for KWA but for the best cost option for the next 30 to 40 years for the people of the City of Flint. However, in our analysis of the options, KWA does several things that I think are in the best interest of our city, our region (Mid Michigan) and the State of Michigan. They are:

1. It provides a second source of water from Lake Huron. Currently over 40% of the people of the state are served by DWSD.
2. DWSD does not provide water services to the Thumb area, namely Sanilac and Lapeer Counties.
3. It affords the opportunity for the region to form a water and sewer authority in the future. Genesee County, the Genesee County Drain Commission, the Cities of Flint and Lapeer, Lapeer and Sanilac Counties as well as other regional municipalities could come together to form a Mid Michigan Water and Sewer Authority to the benefit of the entire region.

Andy Dillon, Treasurer

November 6, 2012

Page 2

- 4 It gives the City of Flint "ownership" in a water distribution system and the ability, along with its partners, to control its own water resource destiny
- 5 It offers additional economic development opportunities for the region by providing businesses with a source of low cost water

I think it is also important to again indicate that Genesee County intends to go ahead with the pipe line with or without Flint. The County Board of Commissioners has already approved bonding for the first stage of the project.

Again, let me assure you that we in the City of Flint have an open mind relative to the outcome

Sincerely,

A handwritten signature in black ink, appearing to read "Edward Kurcz", written over the printed name.

Edward Kurcz
Emergency Financial Manager

Summary of DWSD Cost Allocations to Flint Under Various Scenarios

Flint Only

	Revenue	Rates and Charges		
	<u>Requirement</u>	<u>Fixed</u>	<u>Commodity</u>	<u>Avg Unit Cost</u>
1 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 Inlay 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
	<i>mgd</i>	<i>mgd</i>	<i>mgd</i>	<i>miles</i>	<i>feet</i>	<i>mgd</i>
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 Inlay City Connections	7.9	11.9	11.9	45.2	866	7.9

Recent DWSD Water Rates to Flint

FY	Rates and Charges			Annual Change			Average
	Fixed \$/mo	Commodity \$/Mcf	Avg Unit Cost \$/Mcf	Fixed \$/mo	Commodity \$/Mcf	Avg Unit Cost \$/Mcf	Annual Change
<u>As Charged</u>							
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%
<u>Hypothetical Model Contract</u>							
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%

TFG

PRELIMINARY

THE FOSTER GROUP

11/20/12

Recent DWSD Water Rates to Flint

FY	Rates and Charges			Annual Change			Average
	Fixed \$/mo	Commodity \$/Mcf	Avg Unit Cost \$/Mcf	Fixed \$/mo	Commodity \$/Mcf	Avg Unit Cost \$/Mcf	Annual Change
<u>As Charged</u>							
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%
<u>Hypothetical Model Contract - Flint Only</u>							
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%

TFG

PRELIMINARY

THE FOSTER GROUP

11/20/12

Recent DWSD Water Rates to Flint

FY	Rates and Charges			Annual Change			Average
	Fixed \$/mo	Commodity \$/Mcf	Avg Unit Cost \$/Mcf	Fixed \$/mo	Commodity \$/Mcf	Avg Unit Cost \$/Mcf	Annual Change
<u>As Charged</u>							
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%

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

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anode stations and related O&M? Yes; however, the KWA has not settled on using steel pipe. PCCP pipe may be used. Steel shown in estimate because it is highest in cost and therefore the pricing is conservative.

- d. SCADA monitoring stations require power. Is the cost of bring power to the SCADA stations included? Again, as a point of reference for the Flint Transmission System we estimated \$800,000 for power to SCADA and valve operators. Yes, Genesee County did emphasize that the SCADA system will be simple and straightforward because a lot of controls are not required
- e. Other items discussed at the meeting included:
- The 2009 plant improvement cost is still good; however, there will be some reduction, such as a sulfuric chloride feed system that was eliminated. Plant capacity now is 36MGD, but will be 18 MGD.
 - The KWA Lake Huron Pumping Station (LHPS) is now only high lift pump station
 - Genesee County will provide the distance of the intake pipe from the crib to the LHPS.
 - The intake project is almost ready to bid; waiting for the COE permit.
 - Genesee County is estimating the construction for the pipe lines and pump stations will begin July 2013.
 - The route has been flown for survey
 - Genesee County is estimating construction will be complete and the project will be placed in service by Jan 2016.
 - Genesee County to provide a list of assumptions that the \$272 million cost estimate is based on since the route is now known.

13. The Flint River is identified as a backup: At what capacity? MDD or emergency supply?

The Flint River would serve as a back up supply.

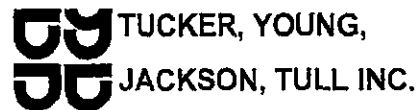
14. Where did the 40 years come from (Flint hostage to Detroit)? DWSD's new contracts are 30 years with openers to revise terms of supply (volume and pressure) after the first two years, then three years, and then in five year increments thereafter.

The 40 years was stated in error. The reference was to DWSD's requirement to sign a 30 year contract.

After 40 years Flint will own 30% of the project and can sell their share of ownership if they want. Conversely, with DWSD, they continue to pay for the capital projects but have no ownership. Flint believes they will know what they will be charged for the next 25 years versus DWSD that can't commit to a fixed escalation.

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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CONSULTING ENGINEERS-PLANNERS
565 E. Larned Suite 300
Detroit, Michigan 48226
(313)963-0612 FAX (313)963-2156

**Indefinite-scope, Indefinite-delivery Contract Number 00383
2012 Professional General Architectural/Engineering Services**

CITY OF FLINT WATER SUPPLY ASSESSMENT

KWA Discussion/Questions for the November 20, 2012 Meeting

1. Is the maximum day demand of 18 MGD for Flint the maximum day demand (MDD) throughout the 25 year planning period? If not, what is the 25 year projected MDD?
2. Copy of the intake contract documents and engineer's estimate.
3. Documentation of the Flint WTP improvements required and cost estimate.
4. Confirm Flint's allocated percentage of the KWA capital improvements (30%)?
5. Copy of the proposed KWA operating agreement for Flint
6. What is the annual operating agreement adjustment projected for the 25 year planning period?
7. Need the route of the pipelines and the locations of the facilities proposed. Purpose is to identify constraints that impact costs (i.e., utilities, environmental (e.g. wetlands), easements, etc.).
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.

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-
- c. Does the cost of the steel pipe segments include corrosion protection measures such as anode stations and related O&M?
 - d. SCADA monitoring stations require power. Is the cost of bring power to the SCADA stations included? Again, as a point of reference the for the Flint Transmission System we estimated \$800,000 for power to SCADA and valve operators.
13. The Flint River is identified as a backup: At what capacity? MDD or emergency supply?
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.

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

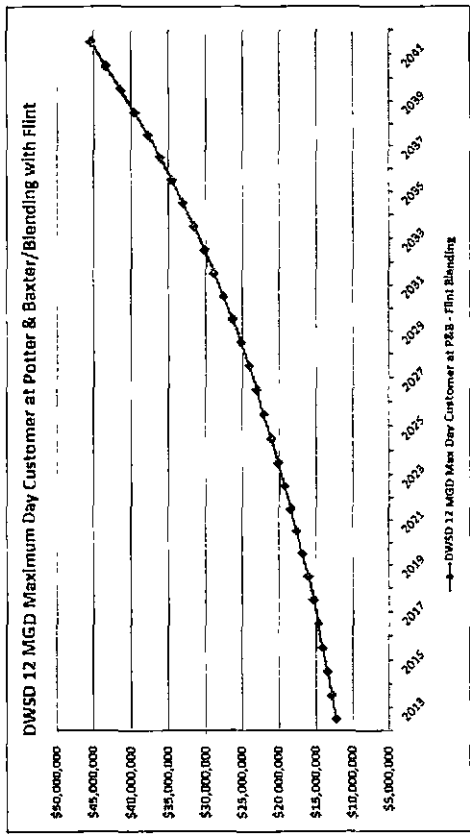
Capacity	Flint AOD DWSD AOD	0.80 MGD 12 MGD	81 MCF/Day 1,604 MCF/Day	Year	Flint WTP O&M Purchase	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
Annual Volume	Flint DWSD	29,412 MCF 585,561 MCF		1	\$ 3,538,214	9,585,642			\$ 13,123,856
				2	\$ 3,697,788	10,056,167			\$ 13,753,955
				3	\$ 3,864,558	10,507,867			\$ 14,372,425
				4	\$ 4,038,850	11,001,736			\$ 15,040,586
				5	\$ 4,221,002	11,518,818			\$ 15,739,820
				6	\$ 4,411,369	12,060,203			\$ 16,471,571
				7	\$ 4,610,922	12,627,032			\$ 17,237,954
				8	\$ 4,818,247	13,220,503			\$ 18,038,750
				9	\$ 5,035,550	13,841,866			\$ 18,877,416
				10	\$ 5,262,653	14,492,434			\$ 19,755,087
				11	\$ 5,499,989	15,173,578			\$ 20,673,577
				12	\$ 5,748,049	15,886,736			\$ 21,634,785
				13	\$ 6,007,286	16,633,413			\$ 22,640,699
				14	\$ 6,278,215	17,415,183			\$ 23,693,398
				15	\$ 6,561,942	18,239,697			\$ 24,795,059
				16	\$ 6,857,279	19,090,681			\$ 25,947,960
				17	\$ 7,166,543	19,987,943			\$ 27,154,486
				18	\$ 7,488,754	20,927,376			\$ 28,417,130
				19	\$ 7,827,542	21,910,563			\$ 29,738,105
				20	\$ 8,180,564	22,940,778			\$ 31,121,342
				21	\$ 8,549,507	24,014,955			\$ 32,564,462
				22	\$ 8,935,090	25,147,887			\$ 34,082,977
				23	\$ 9,338,063	26,329,838			\$ 35,667,901
				24	\$ 9,759,209	27,567,341			\$ 37,326,550
				25	\$ 10,198,350	28,863,005			\$ 39,061,355
				26	\$ 10,659,340	30,219,567			\$ 40,878,907
				27	\$ 11,140,076	31,639,886			\$ 42,779,963
				28	\$ 11,642,494	33,126,561			\$ 44,769,055
				29	\$ 12,167,570	34,683,928			\$ 46,851,499
				30	\$ 12,716,328	36,314,073			\$ 48,930,401
				31	\$ 13,287,871				
				32	\$ 13,881,200				
				33	\$ 14,496,413				
				34	\$ 15,132,600				
				35	\$ 15,789,861				
				36	\$ 16,468,296				
				37	\$ 17,167,915				
				38	\$ 17,888,818				
				39	\$ 18,630,315				
				40	\$ 19,392,616				
				41	\$ 20,175,921				
				42	\$ 20,980,430				
				43	\$ 21,806,343				
				44	\$ 22,653,860				
				45	\$ 23,523,181				
				46	\$ 24,414,506				
				47	\$ 25,328,035				
				48	\$ 26,263,968				
				49	\$ 27,222,595				
				50	\$ 28,204,116				
				51	\$ 29,208,831				
				52	\$ 30,236,140				
				53	\$ 31,286,343				
				54	\$ 32,358,750				
				55	\$ 33,453,661				
				56	\$ 34,571,276				
				57	\$ 35,711,805				
				58	\$ 36,874,558				
				59	\$ 38,060,835				
				60	\$ 39,270,946				
				61	\$ 40,505,191				
				62	\$ 41,763,870				
				63	\$ 43,047,283				
				64	\$ 44,355,830				
				65	\$ 45,689,811				
				66	\$ 47,049,626				
				67	\$ 48,435,675				
				68	\$ 49,848,358				
				69	\$ 51,288,075				
				70	\$ 52,754,226				
				71	\$ 54,246,311				
				72	\$ 55,763,830				
				73	\$ 57,307,183				
				74	\$ 58,876,770				
				75	\$ 60,472,891				
				76	\$ 62,095,946				
				77	\$ 63,746,335				
				78	\$ 65,424,458				
				79	\$ 67,130,715				
				80	\$ 68,864,606				
				81	\$ 70,626,531				
				82	\$ 72,415,990				
				83	\$ 74,233,483				
				84	\$ 76,079,510				
				85	\$ 77,954,671				
				86	\$ 79,858,466				
				87	\$ 81,791,495				
				88	\$ 83,753,258				
				89	\$ 85,744,255				
				90	\$ 87,764,986				
				91	\$ 89,815,951				
				92	\$ 91,897,650				
				93	\$ 93,910,483				
				94	\$ 95,954,850				
				95	\$ 98,030,251				
				96	\$ 100,137,186				
				97	\$ 102,275,155				
				98	\$ 104,443,668				
				99	\$ 106,642,225				
				100	\$ 108,871,326				
				101	\$ 111,131,471				
				102	\$ 113,423,160				
				103	\$ 115,746,893				
				104	\$ 118,103,170				
				105	\$ 120,492,491				
				106	\$ 122,914,256				
				107	\$ 125,368,965				
				108	\$ 127,856,118				
				109	\$ 130,376,325				
				110	\$ 132,929,086				
				111	\$ 135,514,801				
				112	\$ 138,133,060				
				113	\$ 140,784,363				
				114	\$ 143,468,210				
				115	\$ 146,185,101				
				116	\$ 148,935,536				
				117	\$ 151,719,015				
				118	\$ 154,536,038				
				119	\$ 157,386,105				
				120	\$ 160,269,716				
				121	\$ 163,187,371				
				122	\$ 166,139,570				
				123	\$ 169,126,813				
				124	\$ 172,149,600				
				125	\$ 175,208,431				
				126	\$ 178,302,806				
				127	\$ 181,432,325				
				128	\$ 184,597,488				
				129	\$ 187,797,795				
				130	\$ 191,032,746				
				131	\$ 194,302,941				
				132	\$ 197,608,880				
				133	\$ 200,950,163				
				134	\$ 204,327,290				
				135	\$ 207,740,661				
				136	\$ 211,190,776				
				137	\$ 214,678,135				
				138	\$ 218,203,338				
				139	\$ 221,766,085				
				140	\$ 225,366,876				
				141	\$ 228,995,211				
				142	\$ 232,651,590				
				143	\$ 236,335,513				
				144	\$ 240,046,480				
				145	\$ 243,784,991				
				146	\$ 247,550,546				
				147	\$ 251,343,655				
				148	\$ 255,164,818				
				149	\$ 259,013,535				
				150	\$ 262,890,406				
				151	\$ 266,795,031				
				152	\$ 270,728,010				
				153	\$ 274,688,943				
				154	\$ 278,677,430				
				155	\$ 282,694,071				
				156	\$ 286,738,366				
				157	\$ 290,810,815				
				158	\$ 294,911,918				
				159	\$ 299,042,175				
				160	\$ 303,202,086				
				161	\$ 307,392,151				
				162	\$ 311,611,870				
				163	\$ 315,861,643				
				164	\$ 320,141,970				
				165	\$ 324,453,251				
				166	\$ 328,795,986				
				167	\$ 333,169,685				
				168	\$ 337,574,848				
				169	\$ 342,011,075				
				170	\$ 346,478,866				
				171	\$ 350,977,721				
				172	\$ 355,507,140				
				173	\$ 360,067,623				
				174	\$ 364,658,670				
				175	\$ 369,280,781				
				176	\$ 373,933,446				
				177	\$ 378,617,165				
				178	\$ 383,332,438				
				179	\$ 388,079,765				
				180	\$ 392,858,646				
				181	\$ 397,668,481				
				182	\$ 402,509,770				
				183	\$ 407,382,013				
				184	\$ 412,285,710				
				185	\$ 417,220,371				

DWSD Worksheet - 12 MGD Maximum Day Customer with Model Contract at Potter & Baxter/Blending with Flint

Capacity	Flint ADD	4 MGD	535 MCF/Day	1	Year	Flint WTP	Water	Revenue	Bond	Interest on	TOTAL
DWSD ADD	DWSD ADD	8 MGD	1,070 MCF/Day	2	2013	\$ 5,895,097	6,367,005	\$ 12,262,103			\$ 12,262,103
Annual Volume				3	2014	\$ 6,180,966	6,666,255	\$ 12,847,221			\$ 12,847,221
				4	2015	\$ 6,438,826	6,979,569	\$ 13,418,395			\$ 13,418,395
				5	2016	\$ 6,729,217	7,307,608	\$ 14,036,825			\$ 14,036,825
				6	2017	\$ 7,032,705	7,651,066	\$ 14,683,771			\$ 14,683,771
				7	2018	\$ 7,349,880	8,010,666	\$ 15,360,546			\$ 15,360,546
				8	2019	\$ 7,681,359	8,382,167	\$ 16,068,527			\$ 16,068,527
				9	2020	\$ 8,027,289	8,781,364	\$ 16,808,153			\$ 16,808,153
				10	2021	\$ 8,389,842	9,194,088	\$ 17,583,930			\$ 17,583,930
				11	2022	\$ 8,768,224	9,626,210	\$ 18,394,434			\$ 18,394,434
				12	2023	\$ 9,163,671	10,078,642	\$ 19,242,313			\$ 19,242,313
				13	2024	\$ 9,576,952	10,552,358	\$ 20,129,291			\$ 20,129,291
				14	2025	\$ 10,008,873	11,048,298	\$ 21,057,171			\$ 21,057,171
				15	2026	\$ 10,460,273	11,567,558	\$ 22,027,841			\$ 22,027,841
				16	2027	\$ 10,932,031	12,111,244	\$ 23,043,275			\$ 23,043,275
				17	2028	\$ 11,425,066	12,680,473	\$ 24,105,538			\$ 24,105,538
				18	2029	\$ 11,940,336	13,276,455	\$ 25,216,791			\$ 25,216,791
				19	2030	\$ 12,478,845	13,900,448	\$ 26,379,294			\$ 26,379,294
				20	2031	\$ 13,041,641	14,553,769	\$ 27,595,410			\$ 27,595,410
				21	2032	\$ 13,629,819	15,237,796	\$ 28,867,616			\$ 28,867,616
				22	2033	\$ 14,244,524	15,953,973	\$ 30,198,497			\$ 30,198,497
				23	2034	\$ 14,886,952	16,703,810	\$ 31,590,762			\$ 31,590,762
				24	2035	\$ 15,558,354	17,488,889	\$ 33,047,242			\$ 33,047,242
				25	2036	\$ 16,260,035	18,310,866	\$ 34,570,902			\$ 34,570,902
				26	2037	\$ 16,993,363	19,171,477	\$ 36,164,840			\$ 36,164,840
				27	2038	\$ 17,759,764	20,072,537	\$ 37,832,300			\$ 37,832,300
				28	2039	\$ 18,560,729	21,015,946	\$ 39,576,675			\$ 39,576,675
				29	2040	\$ 19,397,818	22,003,695	\$ 41,401,513			\$ 41,401,513
				30	2041	\$ 20,277,660	23,037,869	\$ 43,310,528			\$ 43,310,528
				31	2042	\$ 21,186,956	24,120,649	\$ 45,307,605			\$ 45,307,605

25 Yrs Cumulative
\$ 954,681,686

30 Yrs Cumulative
\$ 762,110,308

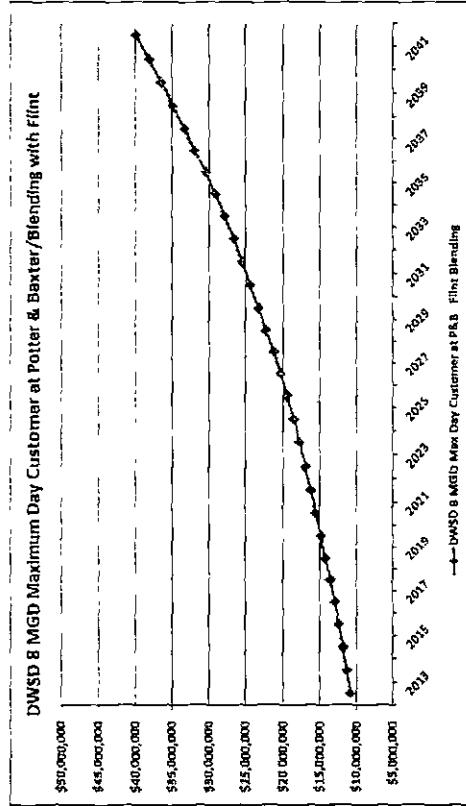


DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Potter & Baxter/Blending with Flint

Capacity	Flint ADD	4 MGD	535 MCF/Day	1	Year	Flint WTP	Water	Revenue	Interest on	TOTAL
DWSD ADD	8 MGD	1,070 MCF/Day	2	2013	\$ 5,895,097	0&M	Purchase	Payment	Reserve	\$ 10,845,044
Annual Volume	Flint	195,187 MCF	3	2014	\$ 6,160,966					\$ 11,343,560
DWSD	DWSD	390,374 MCF	4	2015	\$ 6,438,826					\$ 11,865,002
			5	2016	\$ 6,725,217					\$ 12,410,423
			6	2017	\$ 7,032,705					\$ 12,980,928
			7	2018	\$ 7,349,880					\$ 13,577,669
			8	2019	\$ 7,681,359					\$ 14,201,855
			9	2020	\$ 8,027,788					\$ 14,854,747
			10	2021	\$ 8,389,642					\$ 15,537,668
			11	2022	\$ 8,768,224					\$ 16,251,997
			12	2023	\$ 9,163,671					\$ 16,996,182
			13	2024	\$ 9,576,952					\$ 17,780,732
			14	2025	\$ 10,008,873					\$ 18,596,230
			15	2026	\$ 10,460,273					\$ 19,433,330
			16	2027	\$ 10,932,091					\$ 20,347,762
			17	2028	\$ 11,425,066					\$ 21,283,336
			18	2029	\$ 11,940,336					\$ 22,281,945
			19	2030	\$ 12,478,045					\$ 23,355,570
			20	2031	\$ 13,041,641					\$ 24,506,282
			21	2032	\$ 13,628,919					\$ 25,736,248
			22	2033	\$ 14,244,524					\$ 26,647,795
			23	2034	\$ 14,896,662					\$ 27,873,114
			24	2035	\$ 15,588,354					\$ 29,134,866
			25	2036	\$ 16,320,035					\$ 30,435,581
				2037	\$ 16,993,363					\$ 31,887,982
				2038	\$ 17,750,764					\$ 33,364,899
				2039	\$ 18,560,729					\$ 34,895,303
				2040	\$ 19,397,818					\$ 36,504,308
				2041	\$ 20,272,660					\$ 38,183,155
				2042	\$ 21,186,956					\$ 39,935,743

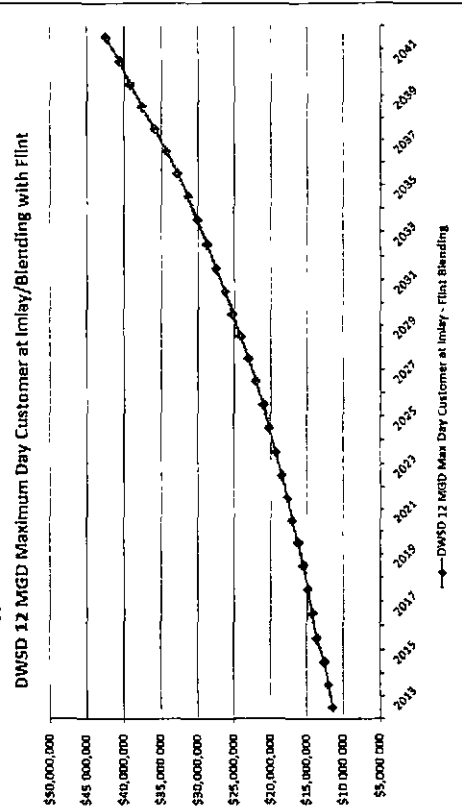
25 Yr Cumulative
\$ 489,780,792

30 Yr Cumulative
\$ 672,671,705



DWSD Worksheet - 12 MGD Maximum Day Customer with Model Contract at Inlay/Blending with Flint

Capacity	Flint ADD	4 MGD	535 MCF/Day	1	Year	Flint WTP	Water	Revenue	Interest
	DWSD ADD	8 MGD	1 070 MCF/Day	2	2013	O&M	Purchase	Bond	on
Annual Volume	Flint			3	2014			Payment	Reserve
	DWSD			4	2015				TOTAL
2013 Cost of Supply				5	2016				
Flint WTP O&M	\$	30 20 /MCF	\$ 5,895,097 /Yr	6	2017				
DWSD	\$	14 38 /MCF	\$ 5,613,583 /Yr	7	2018				
Escalation/Inflation Rate				8	2019				
Flint				9	2020				
DWSD				10	2021				
Capital Expenditure				11	2022				
Capital	\$	4,700,000		12	2023				
Bond Issuance (3% of Total)		150,000	Check	13	2024				
3 Years of Capitalized Interest		975,000	Check	14	2025				
Reserve (10% of Total)		650,000	Check	15	2026				
Total	\$	6,520,000		16	2027				
Revenue Bond Rate		3%		17	2028				
Number of Years		25		18	2029				
Annual Cost		\$462,610		19	2030				
Interest on Reserve		3%		20	2031				



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

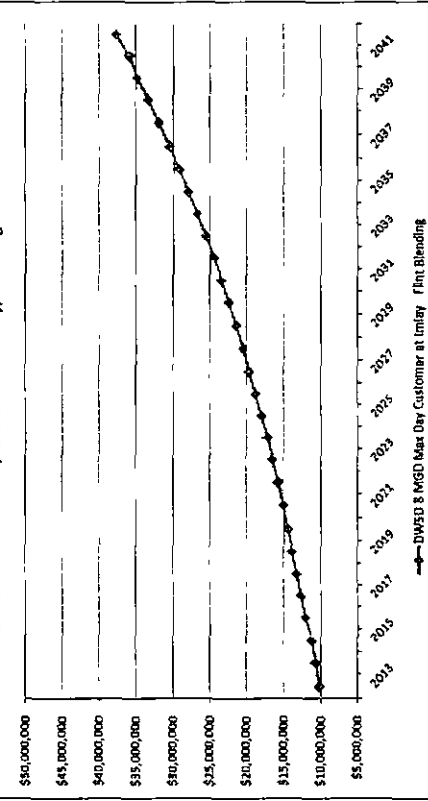
Flint	4.51%	/Yr
DWSD	4.7%	/Yr

Capital Expenditure

Capital	\$ 4,700,000
Bond Insurance (3% of Total)	195,000
3 Years of Capitalized Interest	975,000
Reserve (10% of Total)	850,000
Total	\$ 6,520,000

Revenue Bond Rate	5%
Number of Years	25
Annual Cost	\$462,610
Interest on Reserve	5%

DWSD 8 MGD Maximum Day Customer at Imlay/Blending with Flint



Year	Flint WTP O&M	Water Purchase	Revenue Bond Payment	Interest on Reserve	TOTAL
2013	\$ 5,895,097	4,337,059	19,500	\$ 10,712,656	
2014	\$ 6,160,965	4,540,901	19,500	\$ 10,682,367	
2015	\$ 6,438,826	4,754,729	19,500	\$ 11,173,649	
2016	\$ 6,728,217	4,977,776	462,610	\$ 12,150,103	
2017	\$ 7,032,705	5,211,792	462,610	\$ 12,687,546	
2018	\$ 7,349,880	5,456,683	462,610	\$ 13,248,573	
2019	\$ 7,681,359	5,713,147	462,610	\$ 13,837,616	
2020	\$ 8,027,788	5,981,665	462,610	\$ 14,452,564	
2021	\$ 8,389,842	6,262,803	462,610	\$ 15,095,755	
2022	\$ 8,768,124	6,557,155	462,610	\$ 15,768,489	
2023	\$ 9,163,671	6,865,341	462,610	\$ 16,472,122	
2024	\$ 9,576,952	7,188,012	462,610	\$ 17,208,074	
2025	\$ 10,008,873	7,525,849	462,610	\$ 17,977,832	
2026	\$ 10,460,273	7,879,564	462,610	\$ 18,782,947	
2027	\$ 10,932,031	8,249,903	462,610	\$ 19,625,044	
2028	\$ 11,425,066	8,637,649	462,610	\$ 20,505,824	
2029	\$ 11,940,336	9,043,618	462,610	\$ 21,427,064	
2030	\$ 12,478,845	9,468,668	462,610	\$ 22,390,624	
2031	\$ 13,041,641	9,913,696	462,610	\$ 23,398,447	
2032	\$ 13,629,819	10,379,639	462,610	\$ 24,452,569	
2033	\$ 14,244,324	10,867,482	462,610	\$ 25,555,117	
2034	\$ 14,886,952	11,378,254	462,610	\$ 26,708,316	
2035	\$ 15,558,354	11,913,032	462,610	\$ 27,914,496	
2036	\$ 16,260,035	12,472,945	462,610	\$ 29,176,090	
2037	\$ 16,993,383	13,059,173	462,610	\$ 30,495,546	
2038	\$ 17,759,264	13,672,954	462,610	\$ 31,875,828	
2039	\$ 18,560,729	14,315,583	462,610	\$ 33,319,422	
2040	\$ 19,397,818	14,988,415	462,610	\$ 34,829,443	
2041	\$ 20,272,660	15,692,871	462,610	\$ 35,965,530	
2042	\$ 21,186,956	16,430,436		\$ 37,617,392	

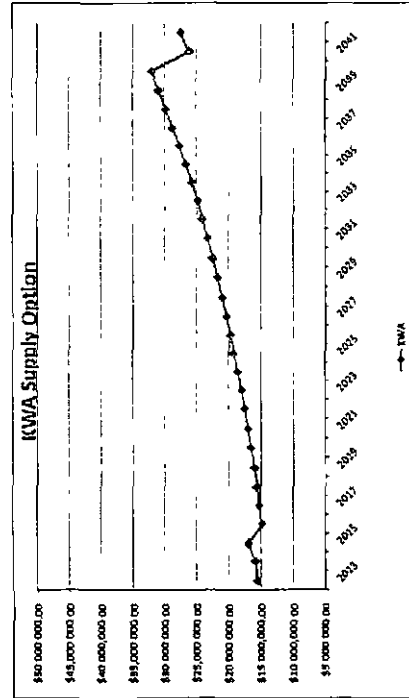
KWA Supply Option Worksheet

KWA 10/31/17 No Overruns

	Year	DAUSD & Flint Wtr Cntr	KWA Entry Fee	KWA Debt Service	Flint WTP Debt Service	KWA Operation ¢	Flint WTP Operations with KWA	TOTAL
1	2015	\$ 14,413,858	1,167,800					\$ 15,576,658
2	2016	\$ 14,955,135	581,400					\$ 15,536,535
3	2017	\$ 14,955,135	581,400					\$ 15,536,535
4	2018	\$ 14,955,135	581,400					\$ 15,536,535
5	2019	\$ 14,955,135	581,400					\$ 15,536,535
6	2020	\$ 14,955,135	581,400					\$ 15,536,535
7	2021	\$ 14,955,135	581,400					\$ 15,536,535
8	2022	\$ 14,955,135	581,400					\$ 15,536,535
9	2023	\$ 14,955,135	581,400					\$ 15,536,535
10	2024	\$ 14,955,135	581,400					\$ 15,536,535
11	2025	\$ 14,955,135	581,400					\$ 15,536,535
12	2026	\$ 14,955,135	581,400					\$ 15,536,535
13	2027	\$ 14,955,135	581,400					\$ 15,536,535
14	2028	\$ 14,955,135	581,400					\$ 15,536,535
15	2029	\$ 14,955,135	581,400					\$ 15,536,535
16	2030	\$ 14,955,135	581,400					\$ 15,536,535
17	2031	\$ 14,955,135	581,400					\$ 15,536,535
18	2032	\$ 14,955,135	581,400					\$ 15,536,535
19	2033	\$ 14,955,135	581,400					\$ 15,536,535
20	2034	\$ 14,955,135	581,400					\$ 15,536,535
21	2035	\$ 14,955,135	581,400					\$ 15,536,535
22	2036	\$ 14,955,135	581,400					\$ 15,536,535
23	2037	\$ 14,955,135	581,400					\$ 15,536,535
24	2038	\$ 14,955,135	581,400					\$ 15,536,535
25	2039	\$ 14,955,135	581,400					\$ 15,536,535
26	2040	\$ 14,955,135	581,400					\$ 15,536,535
27	2041	\$ 14,955,135	581,400					\$ 15,536,535
28	2042	\$ 14,955,135	581,400					\$ 15,536,535

25 Yrs Cumulative
\$ 509,455,115

30 Yrs Cumulative
\$ 849,775,156



KWA Supply Option Worksheet

KWA 1

Capacity	Flint A/D	12 5400	1 604 MCF/Day
	KWA A/D	11 4400	1 604 MCF/Day
Annual Volume	Flint	485 181 MCF	
	KWA	365 591 MCF	
2016 Cost of Supply	Flint WTP O&M	13 51 /MCF	\$ 2,913,318 /Yr
	KWA	1 50 /MCF	\$ 819,879 /Yr

Escalation Rate

Flint	4.5% /Yr
KWA	5.0% /Yr

Capital Expenditure

Capital	\$ 273 413 558
Bond Insurance (2.25% of Total)	\$ 6 041 304
8 Years of Capitalized Interest	\$ 6 000 000
Reserve (10% of Total)	\$ 27 341 356
Total	\$ 374 801 518

Flint's Share (20%)

Revenue Bond Rate	5%
Number of Years	25
Annual Cost	\$ 7 063 362
Interest on Reserves	10%

David Graesslein

Capital	\$ 7 740 882
Bond Insurance (2.25% of Total)	\$ 173 170
8 Years of Capitalized Interest	\$ 1 600 000
Reserve (10% of Total)	\$ 774 088
Total	\$ 10 088 052

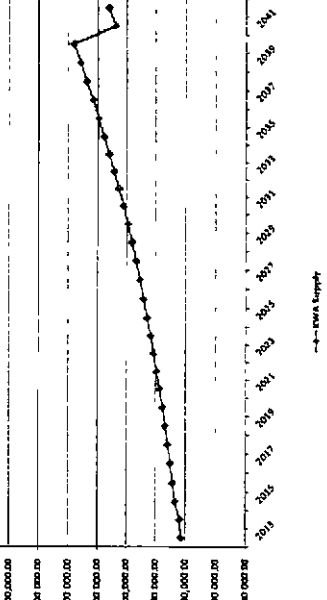
Revenue Bond Rate

Revenue Bond Rate	5%
Number of Years	25
Annual Cost	\$ 7 740 882
Interest on Reserves	10%

David Graesslein

Capital	\$ 7 740 882
Bond Insurance (2.25% of Total)	\$ 173 170
8 Years of Capitalized Interest	\$ 1 600 000
Reserve (10% of Total)	\$ 774 088
Total	\$ 10 088 052

KWA Supply Option



David Graesslein

Replacement portion to Flint's Entry Fee to KWA

Interest rate (assume 5% increase each year)

Year	Flint WTP O&M	Water Purchase	Free & Bond Payment	Flint Negative Bond Payment	Interest on Reserves	TOTAL
2013	\$ 5,582,214	\$ 11,451,292	\$ 1,312,800	\$ 1,312,800	\$ 18,783,114	\$ 18,783,114
2014	\$ 5,867,268	\$ 12,054,785	\$ 1,312,800	\$ 1,312,800	\$ 19,544,611	\$ 19,544,611
2015	\$ 6,164,488	\$ 12,682,594	\$ 1,312,800	\$ 1,312,800	\$ 20,324,682	\$ 20,324,682
2016	\$ 6,474,115	\$ 13,335,889	\$ 1,312,800	\$ 1,312,800	\$ 21,134,093	\$ 21,134,093
2017	\$ 6,796,700	\$ 14,015,312	\$ 1,312,800	\$ 1,312,800	\$ 21,973,912	\$ 21,973,912
2018	\$ 7,132,800	\$ 14,721,392	\$ 1,312,800	\$ 1,312,800	\$ 22,844,384	\$ 22,844,384
2019	\$ 7,482,960	\$ 15,454,760	\$ 1,312,800	\$ 1,312,800	\$ 23,747,820	\$ 23,747,820
2020	\$ 7,847,720	\$ 16,216,064	\$ 1,312,800	\$ 1,312,800	\$ 24,685,344	\$ 24,685,344
2021	\$ 8,227,680	\$ 16,996,032	\$ 1,312,800	\$ 1,312,800	\$ 25,658,512	\$ 25,658,512
2022	\$ 8,623,440	\$ 17,794,400	\$ 1,312,800	\$ 1,312,800	\$ 26,668,000	\$ 26,668,000
2023	\$ 9,035,600	\$ 18,610,880	\$ 1,312,800	\$ 1,312,800	\$ 27,714,960	\$ 27,714,960
2024	\$ 9,463,840	\$ 19,446,080	\$ 1,312,800	\$ 1,312,800	\$ 28,799,040	\$ 28,799,040
2025	\$ 9,907,840	\$ 20,299,600	\$ 1,312,800	\$ 1,312,800	\$ 29,921,280	\$ 29,921,280
2026	\$ 10,367,200	\$ 21,170,000	\$ 1,312,800	\$ 1,312,800	\$ 31,082,200	\$ 31,082,200
2027	\$ 10,841,600	\$ 22,056,800	\$ 1,312,800	\$ 1,312,800	\$ 32,282,400	\$ 32,282,400
2028	\$ 11,330,400	\$ 22,960,400	\$ 1,312,800	\$ 1,312,800	\$ 33,522,400	\$ 33,522,400
2029	\$ 11,834,240	\$ 23,881,200	\$ 1,312,800	\$ 1,312,800	\$ 34,802,400	\$ 34,802,400
2030	\$ 12,353,600	\$ 24,818,800	\$ 1,312,800	\$ 1,312,800	\$ 36,122,400	\$ 36,122,400
2031	\$ 12,888,000	\$ 25,773,600	\$ 1,312,800	\$ 1,312,800	\$ 37,482,400	\$ 37,482,400
2032	\$ 13,437,920	\$ 26,746,000	\$ 1,312,800	\$ 1,312,800	\$ 38,882,400	\$ 38,882,400
2033	\$ 13,992,800	\$ 27,736,400	\$ 1,312,800	\$ 1,312,800	\$ 40,322,400	\$ 40,322,400
2034	\$ 14,553,200	\$ 28,744,400	\$ 1,312,800	\$ 1,312,800	\$ 41,802,400	\$ 41,802,400
2035	\$ 15,119,600	\$ 29,769,600	\$ 1,312,800	\$ 1,312,800	\$ 43,322,400	\$ 43,322,400
2036	\$ 15,691,600	\$ 30,811,600	\$ 1,312,800	\$ 1,312,800	\$ 44,882,400	\$ 44,882,400
2037	\$ 16,268,800	\$ 31,870,400	\$ 1,312,800	\$ 1,312,800	\$ 46,482,400	\$ 46,482,400
2038	\$ 16,851,600	\$ 32,947,200	\$ 1,312,800	\$ 1,312,800	\$ 48,122,400	\$ 48,122,400
2039	\$ 17,439,600	\$ 34,041,600	\$ 1,312,800	\$ 1,312,800	\$ 49,802,400	\$ 49,802,400
2040	\$ 18,033,200	\$ 35,153,200	\$ 1,312,800	\$ 1,312,800	\$ 51,522,400	\$ 51,522,400
2041	\$ 18,632,000	\$ 36,282,400	\$ 1,312,800	\$ 1,312,800	\$ 53,282,400	\$ 53,282,400
2042	\$ 19,236,400	\$ 37,428,800	\$ 1,312,800	\$ 1,312,800	\$ 55,082,400	\$ 55,082,400

\$ 25 Yrs Cumulative \$53,711,159

\$ 25 Yrs Cumulative \$10,278,715

KWA Supply Option Worksheet
KWA 2

CURRENT

FINI ADD	12 MBD	1.60M MCF/Day
KWA ADD	12 MBD	1.60M MCF/Day

ANNUAL VOLUMES

FINI	585,561 MCF
KWA	585,561 MCF

2016 Capital Budget

FINI WTP O&M	\$ 7,913,118 /Yr
KWA	\$ 878,869 /Yr

Residential Unit/Inlet Data

FINI	4.41% /Yr
KWA	5.0% /Yr

Capital Expenditures

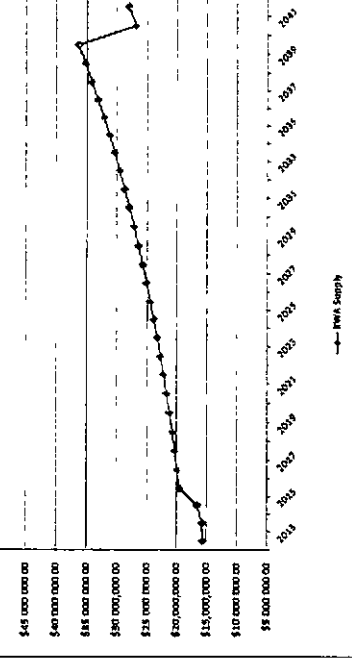
Capital	\$ 897,578,040
Bond Interest (2.25% of Total)	Check
8 Years of Capitalized Interest	74,000,000
Reserve (10% of Total)	48,000,000
Total	\$ 997,578,040

FINI & SHIRE (20%)	\$ 197,488,418
Revenue Bond Rate	5%
Number of Years	28
Annual Cost	\$10,464,646
Interest on Reserve	\$71

Capital	\$ 7,758,242
Bond Interest (2% of Total)	Check
8 Years of Capitalized Interest	1,600,000
Reserve (10% of Total)	1,070,000
Total	\$10,428,242

Revenue Bond Rate	5%
Number of Years	28
Annual Cost	\$796,946
Interest on Reserve	\$71

KWA Supply Option



Year	FINI WTP O&M	Water Purchase	Pre-Bond Entry Fee & Bond Payment	FINI Revenue Bond Payment	Interest on Reserve	TOTAL
2013	\$ 9,552,214	\$1,464,700	\$1,181,800		475,100	\$ 19,659,614
2014	\$ 8,897,748	\$2,894,785	\$81,400		475,100	\$ 15,640,878
2015	\$ 8,662,568	\$16,009			475,100	\$ 18,809,947
2016	\$ 7,913,118	\$17,812			475,100	\$ 19,940,500
2017	\$ 8,270,000	\$17,812			475,100	\$ 19,941,925
2018	\$ 8,642,977	\$86,593			475,100	\$ 20,380,442
2019	\$ 9,032,775	\$1,017,401			475,100	\$ 21,296,896
2020	\$ 8,440,158	\$1,044,866			475,100	\$ 21,916,101
2021	\$ 8,889,904	\$1,127,884			475,100	\$ 22,237,137
2022	\$ 10,715,876	\$1,284,697			475,100	\$ 23,761,845
2023	\$ 11,281,868	\$1,388,490			475,100	\$ 25,508,870
2024	\$ 13,789,779	\$1,888,414			475,100	\$ 25,881,794
2025	\$ 13,800,598	\$1,811,535			475,100	\$ 26,490,668
2026	\$ 12,885,952	\$1,505,164			475,100	\$ 25,107,079
2027	\$ 13,415,179	\$1,578,372			475,100	\$ 25,981,865
2028	\$ 14,041,053	\$1,657,289			475,100	\$ 26,468,804
2029	\$ 14,674,805	\$1,740,101			475,100	\$ 27,182,817
2030	\$ 15,848,116	\$1,827,108			475,100	\$ 27,611,788
2031	\$ 16,027,779	\$1,918,481			475,100	\$ 28,894,748
2032	\$ 16,750,837	\$2,014,384			475,100	\$ 29,513,525
2033	\$ 17,058,080	\$2,115,108			475,100	\$ 30,369,686
2034	\$ 18,295,605	\$2,207,858			475,100	\$ 31,284,978
2035	\$ 18,720,787	\$2,351,901			475,100	\$ 32,291,150
2036	\$ 18,988,082	\$2,448,468			475,100	\$ 33,180,080
2037	\$ 20,584,119	\$2,570,921			475,100	\$ 34,203,952
2038	\$ 21,828,201	\$2,699,467			475,100	\$ 35,274,181
2039	\$ 22,810,549	\$2,834,460			475,100	\$ 36,399,516
2040	\$ 23,659,370	\$2,976,162			475,100	\$ 37,615,482
2041	\$ 24,914,478	\$3,124,970				\$ 38,039,448

\$ 28 Yrs Cumulation
668,057,940

\$ 30 Yrs Cumulation
786,284,313

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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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.

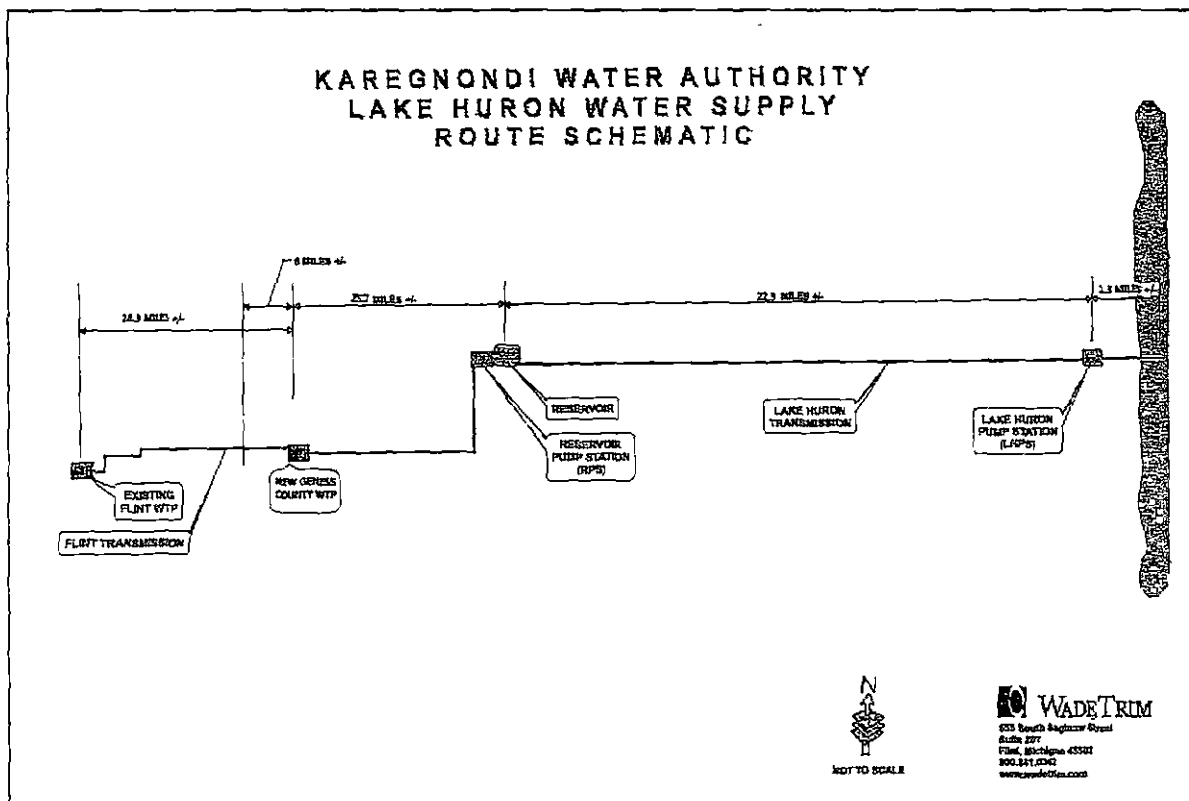


Figure 2-1: KWA Raw Water System

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.

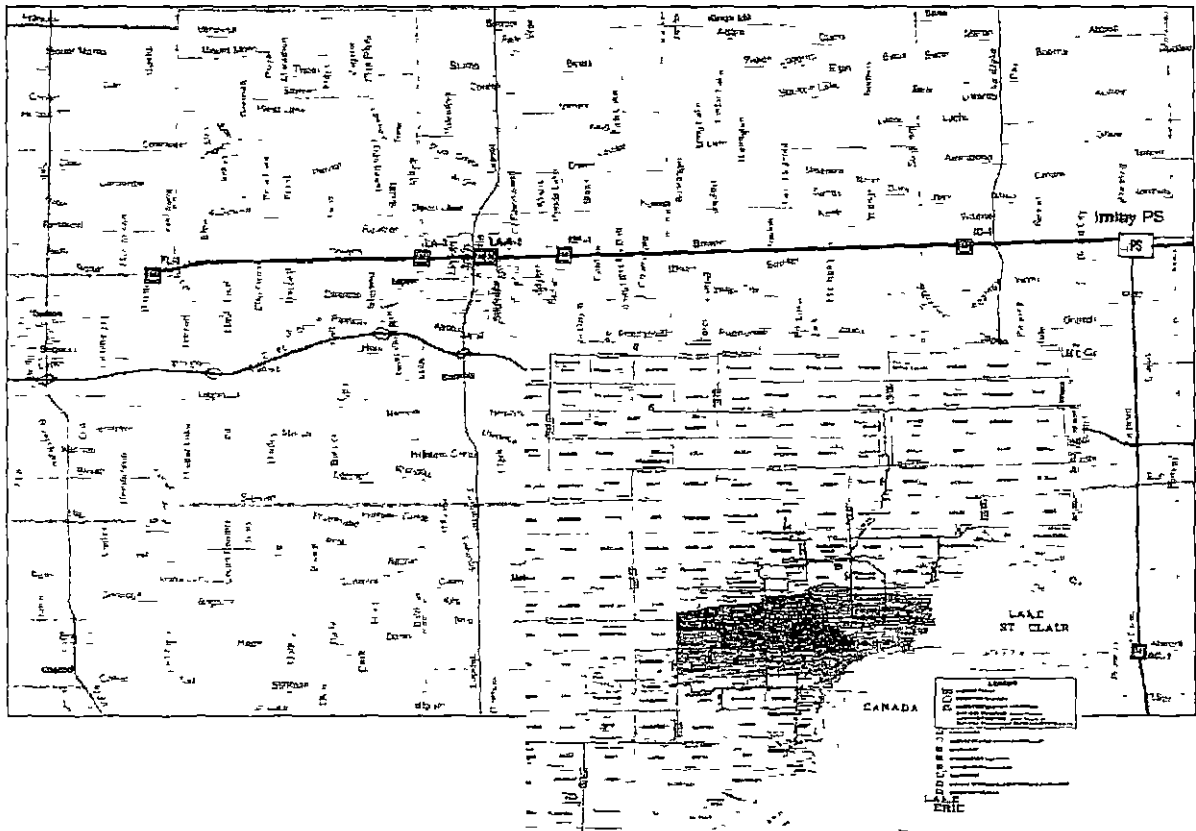


Figure 2-2: DWSD Water System

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.

Service Option	MGD	Unit Cost (\$/MGD)
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

From FL-1

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

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

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.

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 GDCD 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.

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.

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.

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.

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 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.

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.

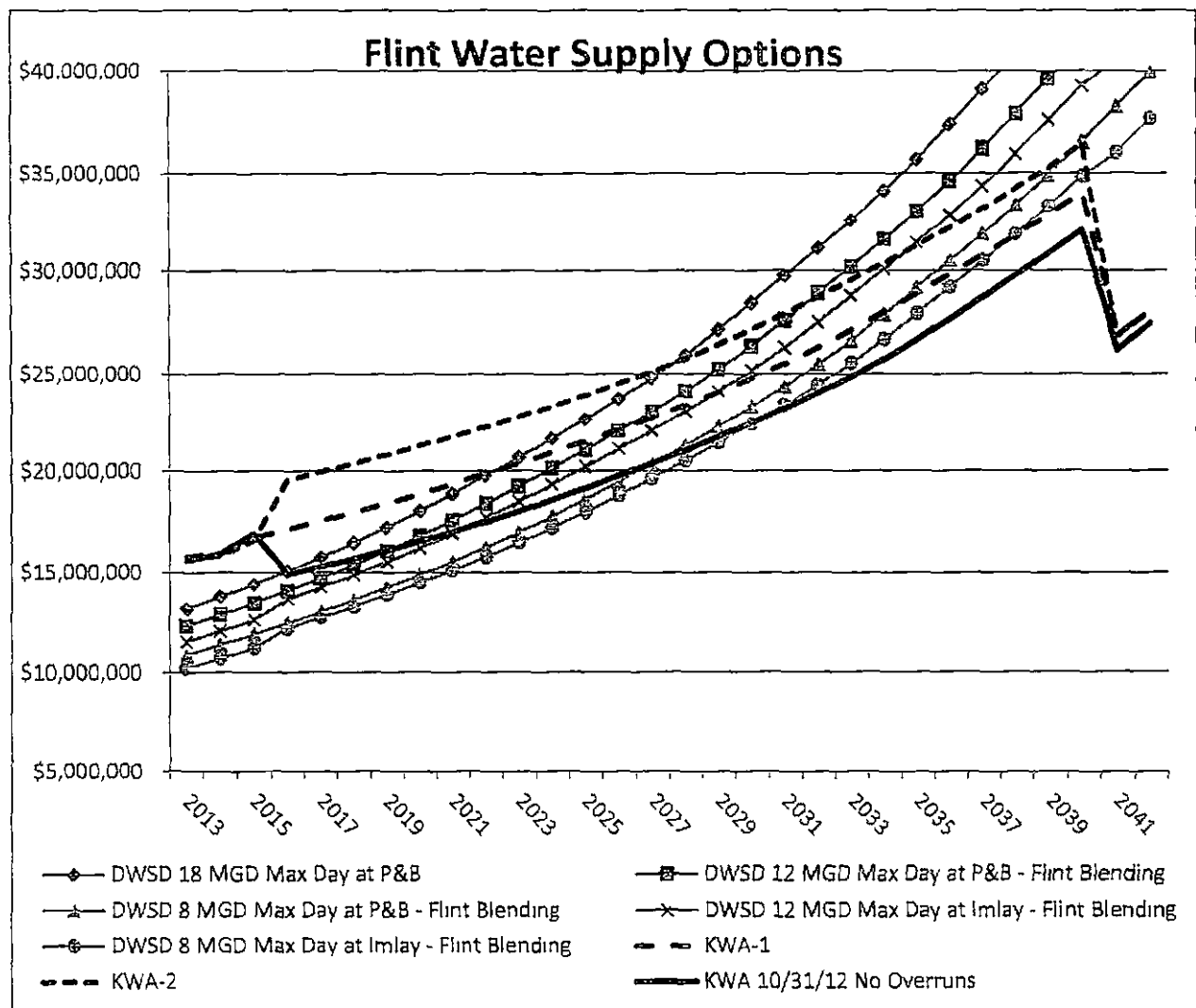


Figure 6-1: Flint Water Supply Options through 2042

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,

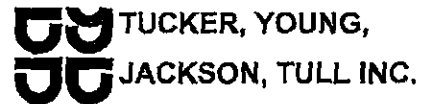
they will have a minority vote on the KWA board. Furthermore, there are other communities (Lapeer County, the City of Lapeer, and Sanilac County) that sit on the board and vote. However, they are not purchasing water nor contributing to the construction costs.

STATE OF MICHIGAN CONTRACT NO. 271N3200089

CITY OF FLINT WATER SUPPLY ASSESSMENT

State of Michigan, Department of Treasury

Appendix A: Meeting Minutes



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.

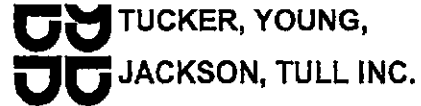
7. Question/Discussion Item: KWA's initial charge to Flint is based on 12 MGD. Is DWSD charge

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based on 12 MGD?

Yes, 12 MGD from DWSD would be a maximum with Flint supplying 6 MGD for a total of 18 MGD (2/3 vs. 1/3).

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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?

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STATE OF MICHIGAN
DEPARTMENT OF TREASURY
LANSING

RICK SNYDER
GOVERNOR

ANDY DILLON
STATE TREASURER

SUMMARY REPORT

TO Brom Stibitz, Senior Policy Advisor, Department of Treasury
FROM Eric Cline Unit Operations Specialist
SUBJECT Flint Water System Summary
DATE April 18, 2013

Summary

In November 2012 the Department of Treasury commissioned the firm of Tucker, Young, Jackson & Tull, Inc (TYJT) to analyze options for the City of Flint to either remain a customer of the Detroit Water & Sewer Department (DWSD) or to join the Karegnondi Water Authority (KWA) in Genesee County. The purpose of this study was to provide objective analyses to the State Treasurer and Flint's Emergency Financial Manager (EFM) in order to secure future potable drinking water for the City.

In December 2012, staff from TYJT met with representatives from the Department of Treasury and the City of Flint to provide a preliminary report on their findings. At this meeting, five options were presented. These options ranged from the Flint Water Plant providing 100% water, to 100% provision of untreated Lake Huron Water by KWA, to 100% provision of treated drinking water by DWSD, or provision of variable amounts of water from DWSD using a combination of blended DWSD water and Flint River water.

From the presentation of the preliminary report in December 2012 to the submission of the final report by TYJT in January 2013, a number of developments made arriving at a final decision very difficult

- DWSD provided the City of Flint with at least two modified proposals to consider
- A debate ensued between TYJT and KWA's principal engineering firm regarding the others' conclusions and estimates for construction of the KWA pipeline.
- The Flint EFM eliminated all options except the 100% DWSD option or joining KWA.

In January 2013, the OFR provided a comprehensive report to the State Treasurer analyzing three questions: 1) The projected construction costs and why Treasury believed the projections provided by Flint/KWA were acceptable, 2) Identification of the construction contingencies, and 3) Identification of the options Flint will utilize in the event of a construction cost overrun or a delay in construction. At the end of this report, the OFR recommended to the State Treasurer that KWA presented the best future option for future potable water. The OFR also concluded that KWA appeared to be the cheaper option, the quality of water would improve; Genesee County appeared willing to assist the City in securing the financing for their portion of the project; the KWA project could signify the beginning of better collaboration between the City of Flint and Genesee County; and the KWA project had both political and popular support.

Between January and April, intense scrutiny of the various proposals was undertaken by Treasury and Flint officials. Treasury officials met with officials from Genesee County to gain a better understanding of the KWA project. In February 2013, Genesee County opened bids for construction of the Lake Huron intakes. This bid opening represented the first meaningful step toward commencing construction of the KWA system. The bid was \$3-million less than projected.

In March 2013, Treasury was notified that DWSD had contacted Flint to negotiate with the City to retain them as a customer. On April 12, 2013, the State Treasurer authorized the Flint EFM to join KWA, pending review of any final offer from DWSD. A final offer was received from DWSD on April 15, 2013.

DWSD's final offer provided two options. The first option was for a "supply only" rate schedule. Only water treatment costs would be recovered and DWSD would absorb all other delivery costs. Capital and operating revenue charges would be calculated based upon KWA's usage relative to the entire demand upon DWSD's Lake Huron WTP. KWA would also have the ability to construct and own its own transmission lines.

The second option was a "full service" rate option. DWSD would provide all production and transmission services. Transmission rates would be calculated only on those costs necessary to supply KWA and no additional transmission rates would be charged. Capital and operating revenue charges would be calculated based upon KWA's usage relative to the entire demand upon the Lake Huron WTP.

Independent analyses of DWSD's final offer by the OFR, the Flint EFM, and the Department of Environmental Quality (DEQ) generally reached the same conclusions:

- DWSD's offer was a framework subject to negotiations and was not a firm offer
- The offer provided by DWSD was incomplete.
- DWSD's offer did not include a guaranteed rate beyond year one, nor did it limit maximum annual rate increases
- The DWSD scenarios were based on 40 MGD of service capacity. However, the KWA project provides 60 MGD of initial capacity with potential expansion to 75 MGD
- DWSD indicates that Flint/ Genesee County would be given "broadened representation," it is unclear exactly what this means in terms of actual control in the decision making processes
- The DWSD offer relies on a single transmission system and would require the City of Flint to maintain its WTP for emergency purposes. In addition, it would leave Genesee County without an adequate backup supply to meet their needs
- DWSD's offer included an attachment that listed the rank-ordered options (from cheapest to most expensive). DWSD Scenario 2 is listed as the least expensive option (but it is unclear how the total cost of this option was arrived at). DWSD Scenario 1 was not listed.
- DWSD provided a summary table of their unit costs but how these figures are arrived at was not clear, so analysis proved difficult.

Without specific details from DWSD on this proposal, a true comparative analysis is difficult to provide. As such the Flint EFM rejected the DWSD proposal and agreed to join KWA.

If further information on this issue is needed, please let me know.

Copy: Roger Fraser, Deputy State Treasurer, Bureau of Local Government Services
Edward Koryzno, Administrator, Office of Fiscal Responsibility
Randall Byrne, State Administrative Manager, Office of Fiscal Responsibility



GENESEE COUNTY DRAIN COMMISSIONER'S OFFICE

JEFFREY WRIGHT

COMMISSIONER

G-4608 BEECHER ROAD, FLINT, MI 48532
PHONE (810) 732-1590 FAX (810) 732-1474



FOR IMMEDIATE RELEASE

CONTACT Jeff Wright

March 26, 2013

810-287-1925

What: Jeff Wright Statement on Flint City Council Approving Resolution to Join KWA.

When: March 26, 2013

Additional Info: Jeff Wright, CEO of the KWA, today praised the Flint City Council for voting to approve a resolution to officially have the City of Flint join the KWA and its' water line.

"I have said from the beginning that this decision must be made by Flint's City Council and Mayor," said Wright. "I appreciate the council voting the way they did, but even more than that, I am glad the residents of Flint were able to have their voices heard via their elected officials." The next step in the process will come with the KWA Board executing the contract for the City

"The most important aspect from the vote is the fact that we as an Authority can move forward knowing Flint's intentions," said Wright.

Despite Emergency Manager Ed Kurtz publicly supporting the project, Wright had made a vote by council a condition of Flint joining the KWA so the residents would have their say.

"There is a basic tenet that government is best when it has local control. We saw that with the council vote. Nobody, whether they live in Flint, Grand Blanc, Davison, Fenton, or anywhere in Genesee County, should have these types of decisions made by people who live outside of their community," said Wright.

At the next Water and Waste Advisory Board meeting a vote will be taken to award a contract for construction of the intake portion of the water line. All bids were submitted to the board at their last meeting for review.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TREASURY
LANSING

ANDY DILLON
STATE TREASURER

Mr. Edward Kurtz
Emergency Manager
City of Flint
1101 South Saginaw Street
Flint, MI 48502

April 11, 2013

Dear Mr. Kurtz,

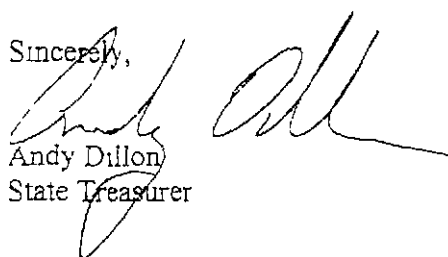
Thank you for your March 29, 2013 letter, which is attached for reference. As the Emergency Manager for the City of Flint ("Flint" or "City"), you have asked for my concurrence, pursuant to Public Act 436 of 2012, the Local Financial Stability and Choice Act, to authorize a contract in excess of \$50,000.00 not subject to competitive bidding. This request was related to the City entering into an agreement with the Karegnondi Water Authority (KWA) for provision of raw water for the City.

In considering your request, I took note of the following facts in support of Flint joining KWA. First, there is widespread support in the City for this move, including the support of the Mayor, the City Council, and the Emergency Manager. Second, this move will provide a unique opportunity for the City and County to partner on an important project, which will hopefully lead to future regional collaboration. Third, the Department of Environmental Quality is supportive of the City participating in the KWA project. Finally, your representations that this deal will lead to substantial savings for the City over the coming decades, savings that are desperately needed to help with the turnaround of the City of Flint.

It is my understanding that the Detroit Water and Sewer Department is making a final best offer to Genesee County and the City of Flint next Monday, April 15, 2013. As such, this approval will be effective at 5 pm on April 16, 2013 after receiving written notice from the City that either no such offer was presented to the county and the City or that an offer was received and was rejected in good faith based upon specified objections.

For the reasons described above and subject to the conditions set forth herein, pursuant to Section 12 (3) of PA 436 of 2012, I am authorizing you to proceed with adopting the resolution and entering into a contract with KWA.

Sincerely,


Andy Dillon
State Treasurer

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
OFFICE OF THE DIRECTOR

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

April 15, 2013

Karengondi Water Authority
4160 Beecher Rd
Flint, Michigan 48532-2617

Ed Kurtz, Emergency Manager
City of Flint
1101 South Saginaw Street
Flint, Michigan

Gentlemen:

Over the last several months, governed by a process laid out by the State of Michigan, the Detroit Water and Sewerage Department (DWSD) has proposed a number of alternatives for long term water supply to the City of Flint. Each alternative was offered in the spirit of working in earnest to address the needs, priorities and concerns of the City of Flint and each provided an immediate cost reduction when compared to the current costs of water purchased from DWSD. In the final analysis conducted by Flint, these proposals did not overcome the desire for the Flint/Genesee region to be served by the same system and to have a voice in the future decisions governing the provision of water to this region.

Many of the proposals DWSD has made to Flint during this period are applicable to Flint/Genesee County or KWA with adjustments to demand and use requirements and would provide similar overall benefit. These options remain available for further discussion should the parties' desire. These prior proposals are included in summary form in Attachment 1 as an expanded table 6-1 from the February 2013 State of Michigan Contract No. 271N3200089, City of Flint Water Supply Assessment, submitted by Tucker, Young, Jackson, Tull, Inc. For comparison purposes only, DWSD's new proposal (Flint's 30% allocated share) is inserted.

The proposal scenarios outlined today offer a public/public partnership with options tailored to Flint/Genesee County or KWAs interests. For ease of writing, the remainder of this memo will present this proposal to KWA. Two basic scenarios are presented for consideration, both of which contemplate that KWA would enter a multi-year contract. Service commitments and usage definitions would be negotiated in the same manner as employed that have resulted in new contracts for other customers.

In brief, the proposal provides a unique opportunity to reserve capacity at DWSD's Lake Huron Water Treatment Plant and to participate in decision making for facility operation and capital investment through a joint operating committee. The proposal envisions that KWA would enter into a 30-year contract to purchase treated water directly onsite at DWSD's Lake Huron Water Treatment Plant.

In Scenario 1 the purchased water can either be pressurized or unpressurized. This first scenario results in a "supply only" rate schedule, with a "standby delivery" component to provide for emergency service at the existing Baxter / Potter connection. This scenario provides KWA the ability to construct new transmission owned and operated by KWA.

Scenario 2 maintains the public/public partnership concept and extends it to transmission facilities through which the Lake Huron Water Treatment Plant provides water. This scenario results in a "full service" rate schedule. The standby delivery component is eliminated, since the rate structure to KWA includes costs associated with the transmission system between the Lake Huron Water Plant and the Baxter / Potter connection.

DWSD proposes a modified rate schedule for the customers currently served through the contract with the City of Flint, which includes Flint and Genesee County. This modified schedule is intended to facilitate negotiations for a new water service agreement with the Karegnondi Water Authority (KWA). The scenarios presented herein represent the innovative thinking that DWSD and its new leadership are bringing to the table. Our goal is to provide the lowest cost water solution for the KWA service area.

The potential rate structures are introduced in summary form herein, with preliminary calculations using the proposed rate structures with FY 2013-14 as a baseline. These calculations and the accompanying discussion are based on the assumptions regarding contract terms that approximate recent discussions amongst the parties.

The proposal introduces the concepts, but does not definitively present all of the specifics, appreciating that such specifics are best addressed through negotiations designed to produce a new contractual agreement satisfactory to all parties.

[Remainder of page intentionally left blank]

Scenario 1 – Lake Huron Direct Supply Purchase:

- KWA enters into a long term partnering arrangement with DWSD to purchase all of its primary water supply directly at the DWSD Lake Huron water treatment plant.
- Supply rate schedule is designed to recover only water treatment revenue requirements. This rate schedule does not contain any delivery costs (pumping, transmission, storage, etc.).
- Supply rate schedule is computed based on specific costs associated with the Lake Huron Plant. No other DWSD revenue requirements, including those associated with other DWSD water plants, are included in the rate to KWA
- Revenue requirements are separated into capital recovery and operation and maintenance expense elements. Baseline revenue requirement data (including operating budget, rate of return, depreciation assumptions, etc.) are identical to those developed for all other wholesale customers.
- KWA is allocated Lake Huron Plant capital revenue requirements based on the proportion of their contracted max day demand (assumed in these calculations at 40.6 mgd) relative to the total capacity at the Lake Huron Plant (400 mgd). The resulting revenue requirements are recovered through a fixed monthly charge.
- KWA is allocated Lake Huron Plant operating revenue requirements based on the proportion of their contracted average daily usage (assumed in these calculations at 24 mgd) relative to the total average daily usage at the Lake Huron Plant (assumed at 125 mgd in these calculations).
- Calculations are conducted for two alternatives Purchase of *pressurized* water (after high lift pumping) and *unpressurized* water (KWA takes directly from clearwell.)
- Contract includes an arrangement for emergency service at the existing Baxter / Potter connection, and computes a standby charge related to such service.
- The standby charge is computed in the manner set for the by the American Water Works Association (AWWA) in its Manual of Water Supply Practices M1 - "Principles of Water Rates, Fees, and Charges" Manual M1.
 - KWA is allocated one day's worth of transmission related capital revenue requirements.

Scenario 2 – "Full Service" Lake Huron System

- Same as the "pressurized" option in Scenario 1, except that concept is extended to the pumping, storage, and transmission facilities directly served by the Lake Huron Plant
- Transmission rate schedule is computed based on specific costs associated with these facilities. No other DWSD revenue requirements, including those associated with other DWSD transmission mains, etc, are included in the rate to KWA.
- Revenue requirements are separated into capital recovery and operation and maintenance expense elements. Baseline revenue requirement data (including operating budget, rate of return, depreciation assumptions, etc) are identical to those developed for all other wholesale customers.
- KWA is allocated Lake Huron "transmission system" capital revenue requirements based on the proportion of their contracted max day demand (assumed in these calculations at 40.6 mgd) relative to the total capacity at the Lake Huron Plant (400 mgd). The resulting revenue requirements are recovered through a fixed monthly charge.

- KWA is allocated Lake Huron "transmission system" operating revenue requirements based on the proportion of their contracted average daily usage (assumed in these calculations at 24 mgd) relative to the total average daily usage at the Lake Huron Plant (assumed at 125 mgd in these calculations).
- Standby charge is eliminated.

The resulting potential proposed rate structures under both Scenarios are summarized below

Potential Proposed DWSD Water Rate to KWA
Lake Huron Direct Scenario

	1 - Supply Rate @ LH Plant		2 - Full Service
	<u>Unpressurized</u>	<u>Pressurized</u>	<u>Wholesale Rate</u>
<u>Supply Rate</u>			
Fixed Monthly Capital Charge - \$	219,900	316,600	503,200
Commodity Rate - \$/Mcf	2.60	4.16	5.31
<i>Average Unit Cost - \$/Mcf</i>	<i>4.85</i>	<i>7.40</i>	<i>10.46</i>
Monthly Standby Charge	167,500	110,300	0
Total Monthly Charge	387,400	426,900	503,200
<i>Total Average Unit Cost - \$/Mcf</i>	<i>6.57</i>	<i>8.53</i>	<i>10.46</i>

The direct comparison over the period 2013-2042 is demonstrated in Attachment 2.

As KWA considers this proposal, I offer the following observations for consideration.

- The Public Partnership requires the least near term capital investment and preserves the economy of scale associated with operation of a large regional system resulting in an immediate reduction in the cost of water supply for Flint/Genesee, making the identified and necessary near term investment in local water infrastructure more feasible.
- The Public Partnership provides the opportunity to optimize service level and efficiency through collaborative asset management decision making.
- The Public Partnership provides representation for critical decision making consistent with DWSD newly demonstrated interest in engaging our customers in critical decisions impacting them. This formalizes that interest in contractual terms.
- The Public Partnership reduces the risks identified with a 'go alone' solution, including further declines in use/sales (see graph), project cost overruns or schedule delays and other unforeseen costs inherent in starting a new venture. See Attachment 3
- The DWSD Board of Commissioners has previously approved sale of raw water from the Lake Huron facilities for raw water end use. We remain open to further discussion about the raw water capacity needs and stand ready to provide an affordable commodity option.



DWSD is an organization in transformation. In April of 2011, a new Board of Commissioners was seated with additional autonomy and more direct customer representation. In the past year we have demonstrated the ability to reduce costs, resolve long standing compliance issues and have gained support for establishing a new legal and operational model for DWSD that could enable broadened representation for Flint/Genesee on the Governing Board.

I remain available to discuss this proposal to assure that each of the issues critical to Flint/Genesee are addressed.

Best regards,

Sue M. McCormick

Sue McCormick, Director
Detroit Water and Sewerage Department

Cc: Andy Dillon, State Treasurer
Dayne Walling, Mayor – City of Flint
Kevyn Orr, City of Detroit Emergency Financial Manager
Jeff Wright, Genesee County Drain Commissioner
James Fausone, Chair – Detroit Board of Water Commissioners

Attachment 1

DWSD Water Supply Costs Estimates to Flint

<u>Option</u>	Water Supply	Ranking
	Costs (\$)	by
	<u>through</u> <u>2042</u>	<u>Cost</u>
DWSD 4/15/2013 Scenario 2	587,990,650	1
DWSD 8 MGD Max Day @ Imlay	634,795,488	2
KWA (10/31/12 No Overruns, As Provided) *	649,775,166	3
DWSD 8 MGD Max Day @ Baxter / Potter	672,671,705	4
KWA-1 (10/31/12 No Overruns with Financing Costs)	707,279,715	5
DWSD 12 MGD Max Day @ Imlay	725,576,803	6
DWSD 12 MGD Max Day @ Baxter / Potter	762,110,308	7
KWA-2 (Treasury Estimate)	766,784,313	8
DWSD 12 mgd Twin Line Proposal / No blending	818,092,150	9
DWSD 18 MGD Max Day @ Baxter / Potter	821,226,268	10

Italicized Options as presented in TYJT Report

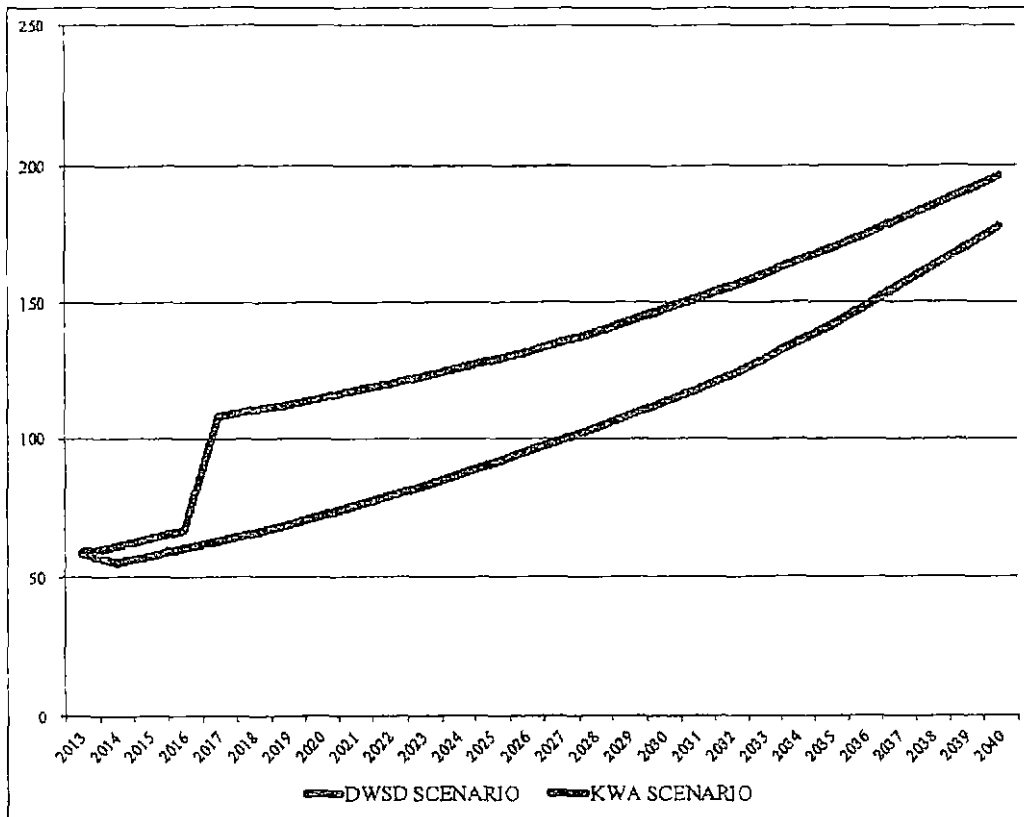
DWSD Water Supply Costs Estimates to Flint / GCDC \$ millions

<u>Option</u>	All Water	Ranking
	Costs (\$)	by
	<u>through</u> <u>2042</u>	<u>Cost</u>
DWSD 4/15/2013 Scenario 2	3,282.00	1
<i>Estimate of KWA</i>	4,090.06	2



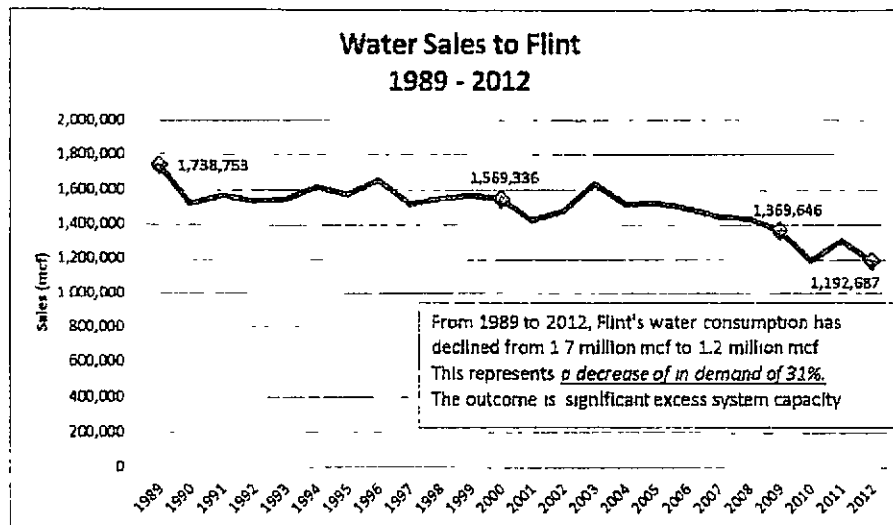
Attachment 2

SUMMARY OF TOTAL PROJECTED WATER COSTS TO FLINT/GCDC - SCENARIO COMPARISON (\$ millions)





Attachment 3





CITY OF FLINT
OFFICE OF EMERGENCY MANAGER
EDWARD J. KURTZ

ELECTRONIC LETTER

April 16, 2013

Andy Dillon
State Treasurer
P O Box 30716
Lansing, MI 48909

Dear Treasurer Dillon:

Flint, Genesee County and KWA received an eight page letter from Detroit Water and Sewerage Department (DWSD) offering a framework for a long-term agreement with our region. Two scenarios were presented,

Scenario 1: Water from the Lake Huron Plant.

This offer was dismissed immediately because Flint would still be responsible for their share of the KWA water pipeline delivery system estimated to be \$79 million. In addition Flint would not be able to operate the Flint Water Plant in which we have invested over \$40 million per MDEQ mandates over the past ten years. Finally, although DWSD shows this as an option and supplied a per month cost projection for the first year, no total costs over the life of the contract were provided.

Scenario 2: "Full Service" Water Supply

This offer was also rejected. DWSD would supply water to Flint/Genesee the same way they currently are today. They would change the method of calculating our bill. The offer would provide a \$1.00 per ccf reduction on our usage for the first year, providing a 30 year contract is signed.

After review of the offer Flint/Genesee has the following concerns.

- 1 DWSD's offer is a framework subject to negotiations and is not a firm offer.
- 2 DWSD's offer is based on 40.6 mgd, the KWA plan is based on 60 mgd. Flint/Genesee last summer hit the peak of 40.6 mgd and this DWSD offer provides no room for growth. Growth would result in penalties or added cost.
- 3 DWSD's offer does not include a guaranteed rate for years two through thirty, nor does it provide a maximum annual increase.
- 4 DWSD's offer does not provide a redundant supply for GCDC.
- 5 DWSD's offer does not allow for the use of Flint's existing water plant.
- 6 The offer indicates that the total cost to Flint over the life of the contract would be \$587,990,665. No indication of what annual rate of increase was used in this projection. Flint can only assume it is 4.4% based on the Tucker Young report. It is also based on 40.6 mgds. KWA's proposal is for \$649,775,166 based on 60mgds (33% more). Based on 60 mgds DWSD's proposal would be \$868,950,738.

On a final note, Flint/Genesee has great concern over the accuracy of the figures provided by DWSD. Attachment 1 indicates that our joint annual cost to DWSD is \$50 million; actual cost is less than \$25 million. Attachment 2 indicates \$800 million in savings over the next 30 years. That is greater than the total cost we would pay DWSD.

Therefore, I will sign the resolution to join KWA at the close of business today.

Sincerely,



Edward J. Kurtz
Emergency Manager

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
OFFICE OF THE DIRECTOR

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

April 17, 2013

Via Certified Mail and Electronic Delivery

Ms. Inez M. Brown
City Clerk
City of Flint
2nd Floor, City Hall
1101 S. Saginaw Street
Flint, Michigan 48502

Dear Ms. Brown:

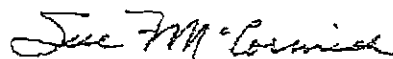
**Regarding: Termination of Contract for the Provision of Water Services
by the City of Detroit, Water and Sewerage Department**

On December 20, 1965, the City of Detroit, through its Board of Water Commissioners, (DWSD) and the City of Flint, Michigan (Flint) entered into a contract for the provision of DWSD treated water to Flint and the distribution by Flint of that water to other Genesee County communities. Section 18 of that Agreement¹ provides:

18. The Board [DWSD] shall supply and sell water to the City [Flint] from the water system of the City of Detroit, and the City shall receive and purchase such water in accordance with the terms of this Agreement for an indefinite period of time but at least for a period of thirty-five (35) years from the date hereof. This Agreement may be terminated by either party after expiration of said 35-year period, upon one year's written notice served upon the other party by delivering the same to the Secretary of the Board or to the Clerk of the City as the case may be, or at any time upon mutual consent of both parties.

Please take notice that pursuant to this section, 18, of the above-referenced Agreement, DWSD is terminating this Agreement one year from today's date (April 17, 2014)

Sincerely yours,


Sue F. McCormick
Director

¹ Although the Agreement between DWSD has been subsequently amended, Section 18 remains unchanged and in full effect.

RECEIVED
CITY OF FLINT
CITY CLERK'S OFFICE
2013 APR 18 AM 11:33

Westward ho: KWA pipeline groundbreaking starts new path for water



By Ron Fonger | rfonger1@mlive.com

on June 28, 2013 at 6:00 AM, updated July 03, 2013 at 9:34 AM

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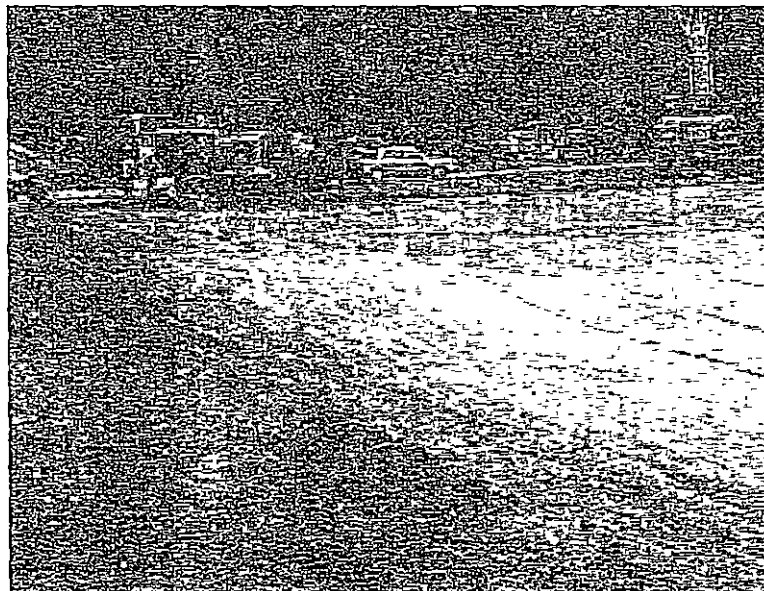
 [Reddit](#)

 [Email](#)

(This story has been updated to correct an error.)

GENESEE
COUNTY, MI --

When dignitaries cut the ribbon near Lake Huron on the new Karegnondi Water Authority pipeline today, June 28, they won't have to



Part of the construction site for the Karegnondi Water Authority water pipeline is shown in this submitted photo.

look far to imagine the project's initial path back toward Genesee County.

Drain Commissioner Jeff Wright said plans call for the pipeline to be buried in the public right of way under Fisher Road, a gravel road that borders Sanilac and St. Clair counties, most of the way to Lapeer County.

Talked about for decades, the water pipeline will put Flint and Genesee County into the water supply business and end its time as a customer of the Detroit Water and Sewerage Department.

Detroit water prices have increased an average of more than 9 percent annually for the last 12 years, according to the county.

The county and city are the key members of the KWA and officials in Sanilac and Lapeer counties have expressed interest in future raw water purchases from the authority. Wright said the city of Lapeer is still considering membership in the KWA.

Flint emergency manager Ed Kurtz has said the city of Flint alone has the potential to save at least \$100 million during the next 25 years by using KWA water

Friday's ceremony at Fisher Road and M-25 marks the start of construction of the intake portion of the pipeline and heavy equipment is already at the site, laying the foundation for that work, much of which will be done in Lake Huron.

While that work gears up this summer, talks are continuing over the design of the pipeline and the firming-up of the exact route it will be built on

"About 95 percent of the pathway has been set," Wright said. "The other 5 percent — we're looking at some options ... potentially a cost savings" by using some private property.

The drain commissioner said he expects to contact about 10 owners of farmland in Lapeer County as early as next week about his interest in using their land. Talks with road commissions in Sanilac and St. Clair counties about Fisher Road started about six months ago, he added.

Sanilac County Road Commission Engineer/Manager Robb Falls said he's already getting questions from Fisher Road residents about the \$274-million pipeline project, which will require detours.

"A lot of people, I think, are happy for the project," Falls said. "They figure maybe the road will actually be improved (as a result). A couple of people have been upset (but) hopefully, maybe the pipeline would allow some industry in the area."

The potential for attracting new businesses with a need for raw water is certain to be one of the subjects of speeches kicking off the pipeline ceremony, which starts at 10 a.m. Friday

Several officials, including Wright, Flint Mayor Dayne Walling, state Reps. Pam Faris and Charles Smiley, and county Board of Commissioners Chairman Jamie Curtis are among scheduled speakers

Wright said visitors to the ground-breaking site might be surprised by how much preparation work, including construction of a service road, has already started.

"It's amazing I'm surprised myself (about) how much they have gotten done," including about 100 feet of road, drainage work, and the creation of a 3-acre staging area for the intake project work, he said

Construction of the water intake will require tunneling under the floor of Lake Huron and the use of divers, who will connect sections of 72-inch diameter pipe underwater.

The work is expected to take 30 months to complete and to bring an estimated 250 workers to the construction zone, located on 230 acres, including 40 acres of shoreline, which is owned by the county.

L. D'Agostini & Sons Inc., a Macomb-area contractor, won the right to build the intake for \$24.6 million, and the job, including engineering, is expected to cost \$26.7 million.

EM SUBMISSION NO.: 2013 em/40PRESENTED: 6-21-13ADOPTED: 6-26-13

BY THE EMERGENCY MANAGER:

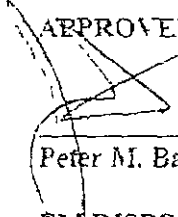
Resolution Authorizing Approval to Enter into a Professional Engineering Services Contract for
the Implementation of Placing the Flint Water Plant into Operation

The City of Flint requires professional engineering services for assistance in placing the Flint Water Plant into operation using the Flint River as a primary drinking water source for approximately two years and then converting to KWA delivered lake water when available at a cost of \$171,000.00, and

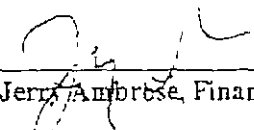
The City of Flint is seeking to enter into a sole source contract with Lockwood, Andrews & Newnam, Inc., with funding coming from the Utilities Administration FY14 account in 591-536.100-801.000 and

IT RESOLVED, That appropriate City Officials are authorized to enter into a Professional Engineering Services contract with Lockwood, Andrews & Newnam, Inc. for the administration of placing the Flint Water Plant into operation using the Flint River as a primary drinking water source at a cost of \$171,000.00. Funding will come from the Utilities Administration FY14 account 591-536.100-801.000

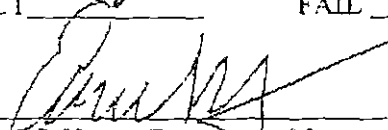
APPROVED AS TO FORM:


Peter M. Bada, Chief Legal Officer

APPROVED AS TO FINANCE:


Jerry Ambrose, Finance DirectorEM DISPOSITION:ENACT ✓

FAIL _____

DATED 6-26-13
Edward J. Kurtz, Emergency Manager

RESOLUTION STAFF REVIEW

Date: June 17, 2013

Agenda Item Title: Resolution Authorizing Approval to Enter into a Professional Engineering Services Contract for the implementation of Placing the Flint Water Plant into Operation

Prepared by:

Yolanda Gray, Utilities Accounting Coordinator

Summary of Proposed Action:

Resolution authorizing the City of Flint to enter into a sole source contract with Lockwood, Andrews & Newnam for professional engineering services to place the Flint Water Plant into operation using the Flint River as a primary drinking water source

Financial Implications:

\$171,000.00

Pre-encumbered? Yes ☐ No ☒ Requisition Funding will be available in the FY14 Utilities Administration budget

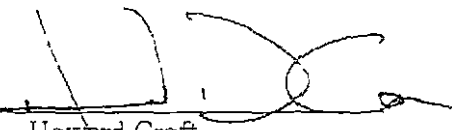
Account No. FY14 591-536 100-801.000

Other implications (i.e. collective bargaining).

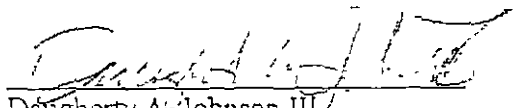
No other implications are known at this time

Staff Recommendation: Recommend Approval

Staff Person


Howard Croft

Infrastructure & Development Director


Daugherty A. Johnson III

Utilities Administrator

KAREGNONDI WATER AUTHORITY FINANCING CONTRACT

THIS CONTRACT, dated as of August 1, 2013, by and among the Karegnondi Water Authority, a municipal authority and public body corporate of the State of Michigan (hereinafter referred to as the "Authority"), the City of Flint in the County of Genesee and the County of Genesee (collectively, the "Local Units" and each a "Local Unit").

WITNESSETH:

WHEREAS, the Authority has been incorporated under the provisions of Act No. 233, Public Acts of Michigan, 1955, as amended (hereinafter referred to as "Act 233"), for the purposes set forth in Act 233; and

WHEREAS, the Authority will acquire, construct and operate a water supply system to be known as the Karegnondi Water Supply System that provides untreated water to the Local Units, each of which is a constituent municipality of the Authority; and

WHEREAS, it is immediately necessary and imperative for the public health and welfare of the present and future residents of each of the Local Units that a certain water supply system, as more fully described on Exhibit A hereto, together with all necessary interests in land, appurtenances and attachments thereto (the "System") be acquired, installed and constructed; and

WHEREAS, plans and an estimate of cost of the System have been prepared by the Authority's consulting engineers, Wade Trim (the "Consulting Engineers"), which said estimate of aggregate cost totals an amount not to exceed \$300,000,000, and

WHEREAS, each of the Local Units is desirous of having the Authority acquire and own the System in order to continue to operate the System in order to furnish the Local Units with untreated raw water; and

WHEREAS, the parties hereto have determined that the System is essential to the general health, safety and welfare of each of the Local Units; and

WHEREAS, the Authority and each of the Local Units are each agreeable to the execution of this Contract by and among themselves which provides, among other things, for the financing of all or a portion of the cost of the System; and

WHEREAS, this Contract contemplates the issuance of bonds in one or more series by the Authority to pay all or part of the costs of the System; and

WHEREAS, each of the Local Units has or will approve and authorize the execution of this Contract by resolution of its governing body; and

WHEREAS, each of the Local Units has published or will publish, individually or jointly, a notice of intention to enter into this Contract in a newspaper of general circulation in the territory encompassed by each Local Unit, and

WHEREAS, this Contract will become effective for each Local Unit upon expiration of a period of forty-five (45) days following publication by each Local Unit of its notice of intention without filing of a petition for referendum on the question of its entering into this Contract, or if such referendum election be required, then upon approval by the qualified electors of the Local Unit.

NOW, THEREFORE, IN CONSIDERATION OF THE PREMISES AND THE COVENANTS MADE HEREIN, THE PARTIES HERETO AGREE AS FOLLOWS:

SECTION 1. The Authority and the Local Units hereby approve the acquisition, construction and operation of System, together with all necessary interests in land, appurtenances and attachments thereto

SECTION 2. Each of the Local Units hereby consents to the use by the Authority and any parties contracting with the Authority of the public streets, alleys, lands and rights-of-way in each Local Unit for the purpose of constructing, operating and maintaining the System including any improvements, enlargements and extensions thereto.

SECTION 3. The System is designed to provide and transport untreated raw water to each of the Local Units and the System is immediately necessary to protect and preserve the public health.

SECTION 4 The Authority and each of the Local Units hereby approve and confirm the plans for the System prepared by the Consulting Engineers and the total estimated cost thereof in the sum of not to exceed \$300,000,000. Said cost estimate includes all surveys, plans, specifications, acquisition of property for rights-of-way, physical construction necessary to acquire and construct the System, the acquisition of all materials, machinery and necessary equipment, and all engineering, engineering supervision, administrative, legal and financing expenses necessary in connection with the acquisition and construction of the System and the financing thereof

SECTION 5. The Authority shall not enter into any final contract or contracts for the acquisition and construction of the System if such contract price or prices will be such as to cause the actual cost thereof to exceed the estimated cost as approved in Section 4 of this Contract unless the Authority has sufficient funds to cover such excess, or, each of the Local Units, by resolution of its respective legislative body, (a) approves said increased total cost, and (b) agrees to pay such excess over the estimated cost, either in cash or by specifically authorizing the maximum principal amount of bonds to be issued, as provided in Sections 9 and 14 of this Contract, to be increased to an amount which will provide sufficient funds to meet said increased cost, and approves a similar increase in the installment obligations of each Local Unit, if any, pledged under the terms of this Contract to the payment of such bonds.

SECTION 6. The System shall be acquired and constructed by the Authority substantially in accordance with the plans and specifications therefor approved by this Contract. All matters relating to engineering plans and specifications, together with the making and letting of final construction contracts, the approval of work and materials thereunder, and construction supervision, shall be in the

control of the Authority. All acquisition of sites and rights-of-way, if any, shall be done by the Authority. Each Local Unit's share of the costs of such acquisition in each Local Unit, if any, shall be paid from the Local Unit's share of bond proceeds and, in addition, any costs incurred by any Local Unit in connection with the acquisition or construction of the System, including, but not limited to, engineering expenses, shall be promptly reimbursed to the Local Unit by the Authority from the proceeds of the Authority's Bonds with the approval of the Authority board

SECTION 7. The Authority shall operate, maintain and administer the System for and on behalf of the Local Units. The System shall be maintained in good condition and repair. The Authority shall provide insurance as part of its obligation to operate the System. The Authority will furnish reports to the Local Units at periodic intervals corresponding with the reporting periods of the Local Units in detail sufficient to inform the Local Units of the operations of the System and to permit the Local Units to meet their financing requirements hereunder.

SECTION 8. To provide for the construction and financing of the System in accordance with the provisions of Act 233, the Authority shall take the following steps:

(a) The Authority will take steps to adopt a resolution or resolutions providing for the issuance of its bonds in one or more series in the principal amount of not to exceed \$300,000,000 (except as otherwise authorized pursuant to Section 5 of this Contract) to finance all or part of the costs of the System. Said bonds shall mature serially or be subject to mandatory sinking fund redemption as authorized by law, and shall be secured by the contractual obligations of each Local Unit in this Contract. After due adoption of the resolution or resolutions, the Authority will take all necessary legal procedures and steps necessary to effectuate the sale or sales and delivery or deliveries of said bonds.

(b) The Authority shall take all steps necessary to take bids for and enter into and execute final acquisition and construction contracts for the acquisition and construction of the System as specified and approved hereinbefore in this Contract, in accordance with the plans and specifications therefor based on the plans as approved by this Contract.

(c) The Authority will require and procure from the contractor or contractors undertaking the actual construction and acquisition of the System necessary and proper bonds to guarantee the performance of the contract or contracts and such labor and material bonds as may be required by law.

(d) The Authority, upon receipt of the proceeds of sale of each series of bonds, will comply with all provisions and requirements provided for in the resolution authorizing the issuance of such series of bonds and this Contract relative to the disposition and use of the proceeds of sale of such series of bonds.

(e) The Authority may temporarily invest any bond proceeds or other funds held by it for the benefit of each Local Unit as permitted by law and investment income shall accrue to and follow the fund producing such income. The Authority shall not, however, invest, reinvest or accumulate any moneys deemed to be proceeds of the bonds pursuant to §148 of the Internal Revenue Code of 1986, as amended, and the applicable regulations thereunder (the "Code"), in such a manner as to cause the bonds to be "arbitrage bonds" within the meaning of Code §

103(b)(2) and §148, or otherwise as may jeopardize the tax status of the bonds.

SECTION 9. Each Local Unit irrevocably covenants and agrees to pay to the Authority its Local Unit share of each series of bonds to be issued by the Authority pursuant to this Contract. The share of each Local Unit shall be determined as set forth on Exhibit B hereto.

The cost of the System to be financed with the issuance of bonds of the Authority in the aggregate principal amount of not to exceed \$300,000,000 shall be paid in annual installments on the dates and in the amounts as established in the Authority's bond authorizing resolution.

Each Local Unit covenants that it will make or cause to be made its payments as required by this Contract not less than 3 days prior to the dates on which the Authority is required to make payments on the bonds described herein to the transfer agent for the bonds

It is understood and agreed that the bonds of the Authority hereinbefore referred to will be issued in anticipation of the above contractual obligation, with principal maturities on the dates established by the Authority corresponding to the principal amount of the installments then coming due, and there shall also be paid in addition to said principal installments, on such dates as shall be determined by the Authority, commencing on such date as determined by the Authority, as accrued interest on the principal amount remaining unpaid, an amount sufficient to pay all interest at an interest rate not to exceed ten percent (10%) per annum, due on the next succeeding interest payment date on the bonds from time to time outstanding

It is further understood and agreed that the bonds of the Authority may be secured by a debt service reserve fund or funds to provide additional security for the timely payment thereof if the Authority determines, in consultation with its financial advisor, that the provision of such debt service reserve fund or funds is advisable. If the bonds of the Authority are secured by a debt service reserve fund or funds, each Local Unit covenants and agrees to provide for the replenishment of such debt service reserve funds as described in Exhibit B.

From time to time as the Authority is billed by the transfer agent for its services for the bonds, and as other costs and expenses accrue to the Authority from handling of the payments made by the Local Units, or from other actions taken in connection with the System, the Authority shall promptly notify the Local Units of the amount of such paying agent fees and other costs and expenses, and the Local Units shall promptly remit to the Authority sufficient funds to meet such fees and other costs and expenses in the proportions hereinabove provided to the extent sufficient funds are not available to the Authority. Each Local Unit warrants and represents that the amount of its obligations under this Contract, when taken together with other indebtedness of such Local Unit, will not cause its obligations under this Contract to exceed any constitutional, statutory or charter debt limitation applicable to such Local Unit.

The Authority shall, within thirty (30) days after the delivery of each series of the bonds of the Authority hereinbefore referred to, furnish each Local Unit with a complete schedule of installments of principal and interest thereon, and the Authority shall also at least sixty (60) days prior to each principal and/or interest installment due date, advise the Local Units, in writing, of the exact amount of principal and interest installments due on each series of bonds on the next succeeding bond principal and/or interest due date, and payable on the first day of the month immediately preceding, as hereinbefore

provided. Failure of the Authority to notify the Local Units of any such payment shall not relieve the Local Units of the obligation to make such payment.

If any principal installment or interest installment is not paid when due, the amount not so paid shall be subject to a penalty, in addition to interest, of one percent (1%) thereof for each month or fraction thereof that the same remains unpaid after the due date.

SECTION 10. Each Local Unit states its intention to pay its obligations under this Contract from sources of moneys as are provided by Act 233 and applicable law, including the levy and collection of rates and charges to users of its respective water supply system for operating and maintaining its system provided by each Local Unit to customers in the Local Unit. Nevertheless, pursuant to the authorization contained in Act 233, each Local Unit hereby irrevocably pledges its full faith and credit for the prompt and timely payment of its obligations pledged for bond payments as expressed in this Contract, and, subject to the provisions of the last sentence of this paragraph, shall each year, commencing with the first tax levy after issuance of the bonds by the Authority, levy an ad valorem tax on all the taxable property in the Local Unit in an amount which, taking into consideration estimated delinquencies in tax collections, will be sufficient to pay such obligations under this Contract becoming due before the time of the following year's tax collections. Such annual tax levies shall be subject to applicable constitutional, statutory, and charter tax limitations. Nothing herein contained shall be construed to prevent a Local Unit from using any, or any combination of, the means and methods provided in Section 7 of Act 233, as now or hereafter amended, for the purpose of providing funds to meet its obligations under this Contract, and, if at the time of making the annual tax levy there shall be either other funds on hand earmarked and set aside, or funds provided in the annual budget of the water supply system of the Local Unit, for the payment of the contractual obligations due prior to the next tax collection period, then such annual tax levy may be reduced by such amount

In the event a Local Unit shall fail for any reason to pay to the Authority at the times specified the amounts required to be paid by the provisions of this Contract, the Authority shall immediately give notice of such default and the amount thereof, to the Treasurer of each Local Unit, the Treasurer of the State of Michigan, and such other officials charged with the disbursement to such Local Unit of funds returned by the State and now or hereafter under Act 233 available for pledge as provided in this Section and in Section 12a of Act 233, and if such default is not corrected within ten (10) days after such notification, the State Treasurer, or other appropriate official charged with disbursement to such Local Unit of the aforesaid funds, is, by these presents, specifically authorized by the Local Unit, to the extent permitted by law, to withhold from the aforesaid funds the maximum amount necessary to cure said deficit and to pay said sums so withheld to the Authority, to apply on the obligations of the Local Unit as herein set forth. Any such moneys so withheld and paid shall be considered to have been paid to the Local Unit within the meaning of the Michigan Constitution and statutes, the purpose of this provision being voluntarily to pledge and authorize the use of said funds owing to the Local Unit to meet any past-due obligations of such Local Unit due under the provisions of this Contract. In addition to the foregoing, the Authority shall have all other rights and remedies provided by law to enforce the obligations of the Local Unit to make its payments in the manner and at the times required by this Contract, including the right of the Authority to direct the Local Unit to make a tax levy to reimburse the Authority for any funds advanced.

SECTION 11. Each Local Unit may pay in advance any of the payments required to be made by this Contract, in which event the Authority shall credit the respective Local Unit with such advance

payment on future due payments to the extent of such advance payment, or use such advances to call bonds without credit to the extent provided in relevant series of bonds.

SECTION 12. Each Local Unit may pay additional moneys over and above any of the payments specified in this Contract, with the written request that such additional funds be used to prepay installments, in which event the Authority shall be obligated to apply and use said moneys for such purpose to the fullest extent possible. Such moneys shall not then be credited as advance payments under the provisions of Section 11 of this Contract.

SECTION 13. It is specifically recognized by each Local Unit that the debt service payments required to be made by each pursuant to the terms of Section 9 of this Contract are to be pledged for and used to pay the principal installments of and interest on with respect to the bonds to be issued by the Authority as provided by this Contract and authorized by law, and each Local Unit covenants and agrees that it will make all required payments to the Authority promptly and at the times herein specified without regard to whether the System is actually completed or placed in operation.

SECTION 14. If the proceeds of the sale of the bonds in one or more series in aggregate amount not to exceed \$300,000,000 to be issued by the Authority are for any reason insufficient to complete each Local Unit's share of the cost of the System, subject to each Local Unit's approval required by Section 5 hereof, the Authority shall automatically be authorized to issue additional bonds in an aggregate principal amount sufficient to pay the cost of completing the System and to increase the annual payments required to be made by each Local Unit in an amount so that the total payments required to be made as increased will be sufficient to meet the annual principal and interest requirements on the bonds herein authorized plus the additional bonds to be issued. It is expressly agreed between the parties hereto that the Authority shall issue bonds pursuant to this Contract and each Local Unit shall be committed to retire such amount of bonds as may be necessary to pay each Local Unit's share of the costs of the System whether or not in excess of those presently estimated herein. Any such additional bonds shall comply with the requirements of Act 233 and any increase in the annual payments shall be made in the manner and at the times specified in this Contract. In lieu of such additional bonds, each Local Unit may pay over to the Authority, in cash, sufficient moneys to complete each Local Unit's share of the cost of the System.

SECTION 15. After completion of the System and payment of all costs thereof, any surplus remaining from the proceeds of sale of bonds shall be used by the Authority for either of the following purposes: (a) for improvements or enhancements to the System or for other projects of the Authority undertaken on behalf of the Local Units, subject to approval of the Authority; or (b) credited by the Authority toward the next payments due the Authority by said Local Units hereunder

SECTION 16. The obligations and undertakings of each of the parties to this Contract shall be conditioned on the successful issuance and sale of the first series of bonds pursuant to Act 233, and if for any reason whatsoever the first series of bonds are not issued and sold within three (3) years from the date of this Contract, this Contract, except for payment of preliminary expenses and ownership of engineering data, shall be considered void and of no force and effect.

SECTION 17. The Authority and each Local Unit each recognize that the owners from time to time of each series of bonds issued by the Authority under the provisions of Act 233 to finance the cost of the System will have contractual rights in this Contract, and it is, therefore, covenanted and agreed by

the Authority and each Local Unit that so long as any of series of bonds shall remain outstanding and unpaid, the provisions of this Contract shall not be subject to any alteration or revision which would in any manner materially affect either the security of such series of bonds or the prompt payment of principal or interest thereon. Each Local Unit and the Authority each further covenant and agree that each will comply with its respective duties and obligations under the terms of this Contract promptly at the times and in the manner herein set forth, and will not suffer to be done any act which would in any way impair the said bonds, the security therefor, or the prompt payment of principal and interest thereon. It is hereby declared that the terms of this Contract insofar as they pertain to the security of any such bonds shall be deemed to be for the benefit of the owners of said bonds

SECTION 18. This Contract shall remain in full force and effect from the effective date hereof (as provided in Section 21) until each series bonds issued by the Authority are paid in full, but in any event not to exceed a period of thirty (30) years for each series of bonds. At such time within said 30-year term as any of the series of said bonds are paid, this Contract shall be terminated. In any event, the obligation of each Local Unit to make payments required by this Contract shall be terminated at such time as all of said bonds are paid in full, together with any deficiency or penalty thereon.

SECTION 19. This Contract shall inure to the benefit of and be binding upon the respective parties hereto, their successors and assigns.

SECTION 20. This Contract shall become effective upon (i) approval by the legislative body of each Local Unit, (ii) approval by the Board of the Authority and (iii) due execution by authorized officers of each Local Unit and by the Chairman and Secretary of the Authority.

SECTION 21. This Contract may be executed in several counterparts.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the day and year first above written.

In the presence of:

KAREGNONDI WATER AUTHORITY

By: _____

Chairman

By: _____

Secretary

In the presence of:

CITY OF FLINT

By: _____

Michael K. Brown, Emergency Manager

In the presence of:

COUNTY OF GENESEE

By: _____

Chairperson of Board of
Commissioners

By: _____

Clerk

MILLER, CANFIELD, PADDOCK AND STONE, P L C

EXHIBIT A

SYSTEM

The Karegnondi Water System is a raw water supply system. It will deliver untreated Lake Huron water 65 miles inland to the population centers of Lapeer and Genesee Counties, including the Cities of Lapeer and Flint, and the County Agency of Genesee County with 17 local municipal systems. The system will also be capable of delivering water along the route to customers in Sanilac and Lapeer County, as well as future customers in Saint Clair County.

The system will consist of a lake intake, two pumping stations, and over 65 miles of large diameter transmission watermain. The system will include fire hydrants, metering stations, reservoirs, and the appurtenances necessary to operate the system efficiently. The lake intake portion of the project and the land where the two pumping stations are located will be acquired, constructed, designed and financed by the County of Genesee and made available for use by the Karegnondi Water System.

All land and required right-of-ways and easements have been acquired.

EXHIBIT B

LOCAL UNIT ESTIMATED SHARE OF IMPROVEMENT COST

The following is a breakdown of the percent each Local Unit is required to pay of the aggregate debt service, including the obligation to replenish a debt service reserve fund(s), if any, on the Authority's bonds authorized by this Contract:

<u>Local Unit</u>	<u>Bond Issue</u>
County of Genesee	65.8%
City of Flint	34.2%

In the event the City of Flint fails to fulfill its payment obligations under this Contract, the County of Genesee irrevocably covenants and agrees to make such missed payment within 1 day of being notified of the missed payment. Further, the Authority covenants and agrees to undertake all legal action and make use of all remedies available under this Contract to enforce the payment obligations of the City of Flint under this Contract. The Authority also covenants and agrees to undertake all legal action and make use of all remedies available to it under the Raw Water Supply Contract between the Authority and the City of Flint dated as of June 28, 2013 ("Raw Water Supply Contract"), as amended, specifically sections 7.08 and 7.09 of such contract. If the County of Genesee is required to make a payment for the City of Flint under this Contract and the Authority recovers any funds from the pursuit of such remedies described above, the Authority shall reimburse the County of Genesee from such funds for any payments made. To the extent permitted by law, the capacity that the City of Flint acquired in the System pursuant to the Raw Water Supply Contract shall be transferred to the County of Genesee until the City of Flint has repaid the County of Genesee for any additional payments made hereunder. The City of Flint shall also pay a penalty of one percent (1%) thereof for each month or fraction thereof that the same remains unpaid after the due date of the amount paid by the County of Genesee as a result of the failure of the City of Flint to fulfill its payment obligations hereunder. Further, if a Local Unit fails to pay its contractual obligation causing a shortfall and the debt service reserve fund(s) is drawn upon to pay the Authority's bonds, the replenishment of such debt service reserve fund shall be an obligation of the Local Unit that failed to pay, as provided in the resolution authorizing the bonds. Provided, however, if the City of Flint fails to fulfill its debt service reserve fund replenishment obligation, as with other payment obligations under the Contract, the County of Genesee agrees to make such payments.

Additionally, if the Authority sells raw untreated water capacity to other parties, to the extent funds are available from payments received from those parties, each Local Unit shall be credited on each day payment is due hereunder as agreed to by the Authority and the Local Units towards each Local Unit's payment obligations hereunder.

Flint to spend \$171,000 for engineering to treat Flint River water while KWA pipeline is built



By Dominic Adams | dadams5@mlive.com

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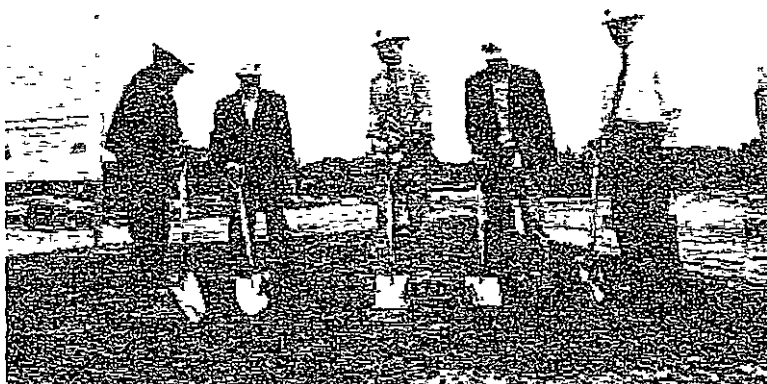
on July 08, 2013 at 6:00 PM

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Jeff Wright, center, Genesee County Drain Commissioner, prepares to break ground for the Karegnondi Water Authority Pipeline in this file photo from Fort Gratiot Charter Township on June 28

Zack Wittman | [MLive.com](#)

FLINT, MI – The city will spend \$171,000 to get Flint's water plant up and running on a continual basis, with the potential to use the Flint River as the primary drinking water source for about two years

While the Karegnondi Water

Authority pipeline is built

The engineering work completed by Flint-based Lockwood, Andrews & Newnam, Inc. also will allow the plant to be used to convert raw water from Lake Huron delivered via the KWA pipeline to drinkable water in Flint.

Flint currently gets its water from Detroit and Flint's water plant has been used as an emergency backup if there was an interruption in service from Detroit.

"The engineering work they're looking at involves potentially using the river on a continuing basis," said Steve Busch, a district supervisor with the Michigan

Department of Environmental Quality. "I think it's yet to be determined if they would use (the Flint River) as a primary source."

City Spokesman Jason Lorenz said Flint would like to work out an agreement with Detroit to provide water for Flint until KWA's pipeline is built

"We still believe that going with Detroit for the next two years (while the KWA pipeline is built) is the best option," said Flint Spokesman Jason Lorenz. "We already had to make these upgrades ahead of KWA."

Former emergency manager Ed Kurtz approved the contract in a resolution signed June 26.

"The city of Flint requires professional engineering services for assistance in placing the Flint water plant into operation using the Flint River as a primary drinking water source for approximately two years and then converting to KWA delivered lake water when available," the resolution reads.

A groundbreaking ceremony for the \$274 million pipeline project took place last month.

In April, Flint decided to get its water from the KWA, thus ending its longstanding water deal with the Detroit Water and Sewerage Department.

Detroit then gave Flint and Genesee County notice that Detroit would terminate the 50-year-old water deal between the two cities effective April 17, 2014.

The engineering work approved by Flint will allow for the use of the Flint River as drinking water for Flint while the KWA is being built.

Upgrades to the plant's water softening process also will be done, Busch said.

"Regardless of the source, they'd have to provide treated water that meets all drinking water standards and public health regulations," he said. "They're just trying to do upgrades to existing equipment to be able to provide on a consistent basis."

Detroit water prices have increased an average of more than 9 percent annually for the last 12 years, Genesee County officials have previously said.

The county and city are the key members of the KWA, while officials in Sanilac and Lapeer counties have expressed interest in future raw water purchases from the authority

Genesee County Drain Commissioner Jeff Wright previously said the project will take up to three years to construct the 64 miles of pipeline, an intake a mile out into Lake Huron, pumping stations and a county water treatment plant.

County officials said Flint would pay roughly \$6.4 million annually for water service if it joined the pipeline – a nearly \$4 million savings on what it pays Detroit for water.

Flint Mayor Dayne Walling previously said the city would save \$19 million over eight years by getting water from the KWA.

Dominic Adams is a reporter for MLive-Flint Journal. Contact him at atdadams5@mlive.com or 810-241-8803. Follow him on Twitter, Facebook or Google+.

**KAREGNONDI WATER AUTHORITY
ACTING IN GENESEE COUNTY, MICHIGAN**

RESOLUTION NO. 2014-01

A RESOLUTION APPROVING THE FIRST ADDENDUM
TO THE RAW WATER SUPPLY CONTRACT BETWEEN THE
KAREGNONDI WATER AUTHORITY AND THE CITY OF FLINT DATED JUNE
28, 2013, AND EFFECTIVE ON OCTOBER 1, 2013

At a meeting of the Karegnondi Water Authority Board, acting in Genesee
County, Michigan, held on February 19, 2014, at 2:00 p.m., local time

PRESENT: _____

ABSENT: _____

The following preamble and resolution were offered by
_____ and seconded by _____.

PREAMBLE

WHEREAS, the Karegnondi Water Authority Board, by Resolution 2013-
01, approved a Raw Water Supply Contract between the Karegnondi Water
Authority and the City of Flint, which is dated June 28, 2013, and effective on
October 1, 2013 (hereinafter "Water Contract") ; and

WHEREAS, the KWA Incorporating Board, KWA Authority Board, and the City of Flint have agreed to modify the Water Contract by approving a written addendum pursuant to ARTICLE VII, Section 7.20 of the Water Contract; and

WHEREAS, the main purpose of the proposed written addendum is to allow the KWA to issue bonds for the construction of the water transmission main and all appurtenants thereto,

NOW, THEREFORE, BE IT RESOLVED THAT:

The Incorporating Board hereby approves the First Addendum, attached hereto and incorporated herein by reference. to the Water Contract ("First Addendum")

NOW, THEREFORE, BE IT FURTHER RESOLVED THAT:

The KWA Authority Board hereby approves the First Addendum to the Water Contract.

NOW, THEREFORE, BE IT FURTHER RESOLVED THAT:

The Chief Executive Officer and the Attorney appointed to represent the KWA may modify the First Addendum as long as the intent of the First Addendum adopted this day is not modified to diminish the authority of the KWA Board or its ability to accomplish the main purpose of the First Addendum.

ROLL CALL
VOTE:

RESOLUTION 2014-01 DECLARED ADOPTED.

Printed Name: Dayne Walling
Its: Chairperson of the Incorporating
and Authority Board

Printed Name: Steve Montle
Its: Secretary

STATE OF MICHIGAN }
 } ss
COUNTY OF GENESEE }

I Steve Montle, Secretary of the Karegnondi Water Authority Board, do hereby certify the foregoing is a true and complete copy of a resolution adopted by the Karegnondi Water Authority Board, acting in Genesee County, at a regular meeting held on February 19, 2014, and that public notice of said meeting was given pursuant to Act 267 of the Michigan Public Acts of 1976, as amended, including in the case of a special or rescheduled meeting, notice by publication or posting at least eighteen (18) hours prior to the time set for the meeting.

IN WITNESS WHEREOF, I have affixed my official signature on this ____
day of _____.

Printed Name: Steve Montle
Its: Secretary

*Prepared by
Janis M. Wells, Deputy Secretary*

**FIRST ADDENDUM TO
RAW WATER SUPPLY CONTRACT BETWEEN THE KAREGNONDI WATER
AUTHORITY AND THE CITY OF FLINT DATED JUNE 28, 2013, AND
EFFECTIVE ON OCTOBER 1, 2013**

THIS FIRST ADDENDUM ("Addendum") to the RAW WATER SUPPLY CONTRACT BETWEEN THE KAREGNONDI WATER AUTHORITY AND THE CITY OF FLINT DATED JUNE 28, 2013, AND EFFECTIVE ON OCTOBER 1, 2013 (hereafter the "Contract") is entered into effective _____, by and between the Karegnondi Water Authority, a Michigan Public Authority created pursuant to Act 233 of the Michigan Public Acts of 1955, as amended (hereinafter "KWA"), whose address is G-4610 Beecher Road, Flint, Michigan 48532 and the City of Flint, a municipal corporation, of the State of Michigan (hereinafter "Flint"), whose address is 1101 South Saginaw Street, Flint, Michigan 48502. KWA and Flint are sometimes hereafter each referred to as a "Party" and collectively as the "Parties."

WITNESSETH:

WHEREAS, the Parties entered into a Raw Water Supply Contract, dated the 28th day of June, 2013, and effective on October 1, 2013;

WHEREAS, the Parties have agreed to enter into this Addendum for the purpose of modifying the Recitals, ARTICLE I, Section 1.02(6); ARTICLE I, Section 1.02(18); ARTICLE II, Section 2.04; ARTICLE II, Section 2.05; ARTICLE II, Section 2.07; ARTICLE VI, Section 6.06; and EXHIBIT A, Section 2(b) of the Contract.

NOW THEREFORE, it is hereby agreed by the Parties as follows:

1. **Amendment to the RECITALS of the Contract.** Add the following recital to the RECITALS of the Contract:

WHEREAS, the Parties hereto acknowledge and agree that the intake system and the property where the two (2) pump systems may be acquired, constructed, is owned by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended.

2. **Amendment to the RECITALS of the Contract.** Add the following recital to the RECITALS of the Contract:

WHEREAS, the Parties hereto acknowledge and agree that the intake system and the property where the two (2) pump systems may be acquired and constructed was acquired and purchased by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended, and the County Agency shall be provided with a credit for the purchase and construction of the property and intake as annually in an amount equal to the

aggregated debt service of the County of Genesee's Water Supply System Revenue Bonds (Limited Tax General Obligation) Series 2013 (the "County Bonds") as more fully set forth in Exhibit A to this addendum. The County Bonds were issued in the original principal amount of Thirty-Five Million Dollars (\$35,000,000.00).

3. **Amendment to ARTICLE I, Section 1.02(6) of the Contract.** ARTICLE I, Section 1.02(6) of the Contract is hereby deleted in its entirety and replaced with the following.

- (6) "Capacity Fee" means the monthly fee paid by the Buyer to the Authority pursuant to Article III of this Contract for the limited rights to capacity. The Capacity Fee shall be billed to the Buyer monthly on the Capital Expenditure Invoice. All interest earned on the Capacity Fee shall be transferred to the reserve fund to be applied to debt service as determined by the Authority and shall not be returned to the general operations fund. The aggregate Capacity Fee payable by all Buyers shall be sufficient to enable the Authority to pay the principal of, redemption premium, if any, and interest on the Bonds, as such principal, redemption premium, if any and interest become due, less interest to be paid out of Bond proceeds or from other sources if permitted by any Bond Resolution, and all amounts required to redeem any Bonds prior to maturity when and as provided in any Bond Resolution, plus the fees, expenses and charges of each paying agent/registrar for paying the principal of and interest on the Bonds, for authenticating, registering and transferring Bonds on the registration books of the Authority maintained with the paying agent/registrar, and all annual disclosure fees. Additionally, the Capacity Fee shall include the proportionate amount of any reserve funds required to be accumulated and maintained by the provisions of any Bond Resolution or as determined by the Authority and the proportionate amount of any contingency funds, if so required by the Authority. If the Bond Resolution so requires, the Capacity Fee shall allow for an amount sufficient to restore any deficiency in any of such funds required to be accumulated and maintained by the Authority. The Capacity Fee shall terminate upon redemption of the bonds issued for the implementation and construction of the System.

4. **Amendment to ARTICLE I, Section 1.02(18) of the Contract.** ARTICLE I, Section 1.02(18) of the Contract is hereby deleted in its entirety and replaced with the following:

- (18) **"System"** means the long-range Water supply system authorized by this Contract, together with all improvements, enlargements, extensions and additions which, pursuant to this Contract, are deemed necessary and feasible by the Authority to provide Water supply as contracted herein to the Buyer from the point of withdrawal to the Point of Delivery; and, all future new facilities, which are acquired or constructed with proceeds from the sale of any bonds or revenues from the System; and, any water supply facilities which are deliberately and specifically, at the option of the Authority, made a part of the System by resolution of the Authority Board, and all repairs to or replacements of the System. The System is owned exclusively by the Authority and shall remain with the Authority. In the event that the Authority is dissolved the System shall be disposed of in a manner consistent with Article V of the Articles of Incorporation. Notwithstanding anything in this Contract to the contrary, the intake system and the property where the two (2) pump systems may be acquired, constructed, and owned by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended, through the issuance of the County Bonds.

5. **Amendment to ARTICLE II, Section 2.04 of the Contract.** ARTICLE II, Section 2.04 of the Contract is hereby deleted in its entirety and replaced with the following:

Section 2.04. Construction of the System. The Authority agrees to use its best efforts to issue System Development Bonds, payable from and/or secured by the Capacity Fee payments made under this Contract and any other lawful sources. Allocated portions of the System Development Bond issues may be used to fund any other approved use as determined by the Authority's Bond Counsel.

6. **Amendment to ARTICLE II, Section 2.05 of the Contract.** ARTICLE II, Section 2.05 of the Contract is hereby deleted in its entirety and replaced with the following:

Section 2.05 Enhancement and Expansion of the System. It is anticipated that the enhancement and expansion of the System will be in incremental, finite projects and that each such project will be financed by the Authority through the issuance of one or more series or issues of System Improvement Bonds. Also, on its own initiative or at the request of the Buyer, the Authority may refund any Bonds that were issued to extend, enlarge, repair, renovate, equip, operate, maintain and otherwise improve the System and any System facilities. The Authority agrees that such improvements for the System will be made in accordance with generally accepted engineering practices. It is anticipated that such improvements will be financed by the Authority through the

issuance of one or more series or issues of System Improvement Bonds payable from and secured by the payments made under this Contract and/or any other lawful sources.

7. **Amendment to ARTICLE II, Section 2.07 of the Contract.** ARTICLE II, Section 2.07 of the Contract is hereby deleted in its entirety and replaced with the following:

Section 2.07. Financing of the Infrastructure. The Authority and Buyer expect to use bond financing and any other lawful sources for construction of the System and any other approved use for the financing and constructing the Authority's facilities. The Authority through its Financial Advisor may establish appropriate custodial and/or trust accounts to hold the debt service and the proceeds from bond sales and shall establish an investment policy defining the Authority's rights to and the Authority's requirements and restrictions related to the investment of the proceeds from bond sales. Further, the custody and/or trust agreement, if any, and also the related investment policy shall comply with appropriate State of Michigan statutes and audit requirements and will be reviewed and approved by the Authority's legal counsel. The Authority may pledge revenues from this Contract to secure financing of the System, in addition to the Capacity Fees, the Members of the Authority may pledge the full faith and credit of their respective municipality toward any bonds issued by the Authority at the request of the Authority. The title of the System shall be solely in the name of the Authority. The Buyer expressly agrees that it shall not have any claim to any portion of the physical infrastructure of the System. The Buyer pursuant to this Contract shall only have rights to capacity and the amount of Water purchased. Notwithstanding anything to the contrary in this Contract, to the extent the County of Genesee, or its County Agency, finances the acquisition, construction of the intake facility or the property where the two (2) pump stations are located in the amount of Thirty-Five Million (\$35,000,000.00) through the issuance of the County Bonds and makes the same available to the Authority for the duration of this Contract, the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended, shall be credited yearly in an amount equal to its bond payment with interest and fees thereby receiving a full credit for the amount paid for the intake and the property where the two (2) pumping stations are located. Once the County Bonds have been redeemed in their entirety and the County Agency has received a credit in an aggregate amount equal to the aggregate debt service of the County Bonds, as fully set forth in Exhibit A to this addendum, the County

Agency shall transfer the property, intake, and all structures, fixtures, and assets located on the property to the Karegnondi Water Authority. Further, the parties hereto expressly agree that the County Agency will receive an annual payment credit equal to the aggregate debt service on the County Bonds.

8. **Amendment to ARTICLE III, Section 3.04 of the Contract.** ARTICLE III, Section 3.04 of the Contract is hereby deleted in its entirety and replaced with the following.

Section 3.04 The Buyer expressly agrees that the Authority is responsible for furnishing Water to the Buyer and it may take several years after the execution of this Contract before Water is made available to the Buyer. Understanding that the goal of the Authority is to provide Water that benefits both the Authority, the Buyer, and the future needs of the Buyer, the Buyer shall pay to the Authority a good faith one-time fee of not less than thirty-two thousand three hundred dollars (\$32,300.00) per Unit of Water purchased after October 1, 2013, but prior to October 31, 2013.

Additionally, to show its continued good faith, the Buyer shall pay to the Authority not less than thirty-two thousand three hundred dollars (\$32,300.00) per Unit purchased per year until such time as Water is made available to the Buyer. Said payments shall be made in monthly installments. The good faith payments are being used to secure a Water supply for the Buyer. As such, Buyer agrees that it is not entitled to any interest on the good faith payments made to the Authority. The good faith payments shall be credited to the Buyer, after Water is made available to the Buyer, over a time period determined by the Authority Board, not to exceed the term of this Contract. Said credits shall be applied to the monthly invoice sent to the Buyer by the Authority.

After Water is made available to the Buyer, the Buyer shall pay the cost per Unit per year for Water or the cost per Unit per year for Volume for Exempt Purposes in the form of a certified bank check or wire transfer. Said payments shall be made in monthly installments. The actual payment amount will be ultimately determined by the total number of Units sold and the amount of Units available for purchase. See Exhibit D. If the Authority determines after the System is designed and the estimated costs are confirmed that the anticipated cost of construction of the System will exceed the funds and assets from the proceeds of the County Bonds and bonds issued by the Authority and secured by a Contract between the City of Flint, the County of Genesee and the

Authority dated as August 1, 2013, the Buyer shall have the right to cancel this Contract pursuant to Section 7.04 of this Contract.

9. **Amendment to ARTICLE VI, Section 6.06 of the Contract.** ARTICLE VI, Section 6.06 of the Contract is hereby deleted in its entirety and replaced with the following:

Section 6.06. Buyer Payment Obligations. The Buyer shall raise money to pay the Capacity Fee, the Annual Requirement, Water Transmission Fee, the Debt Fund fee, fee for Volume for Exempt Purposes, and any other fee, if any, required under this Contract to the extent authorized by law through the levy of taxes, water system revenues collected from its customers, or from any other lawful source.

10. **Amendment to ARTICLE VII, Section 7.04(b) of the Contract.** ARTICLE VII, Section 7.04(b) of the Contract is hereby deleted in its entirety and replaced with the following:

(b) If the Authority Board determines that the cost of constructing the System will exceed the maximum amount provided in Section 3.04, provided, however, this right to cancel must be exercised before the Authority issues any System Development Bonds

11. **Amendment to EXHIBIT A, Section 2(b) of the Contract.** EXHIBIT A, Section 2(b) of the Contract is hereby deleted in its entirety and replaced with the following:

(b) Depending on an analysis of costs and other considerations, there may be one or two Points of Withdrawal utilized by the Authority for the extraction of Water from Lake Huron. A general site map of all possible Points of Withdrawal is set forth in attachment 2 to this Exhibit A. An engineer hired by the Authority pursuant to the Contract shall prepare an analysis of costs and preliminary design plans for the construction of all necessary components. The actual design of the Point of Withdrawal and location of the Point or Points of Withdrawal shall be subject to change as required by environmental Studies and Permits obtained pursuant to provisions of Exhibit E. Further the Point of Withdrawal may be acquired, constructed and designed by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended. The County Agency will agree to make the intake facility available to the Authority.

12. **Notices.** Any notice, demand, or communication required, permitted or desired to be given under this Addendum shall be deemed effectively given pursuant to ARTICLE VII, Section 7.24 the Contract.

13. **Headings.** The headings of the sections set forth in this Addendum are inserted for the convenience of reference only and shall be disregarded when construing or interpreting any of the provisions of this Addendum.

14. **Complete Agreement.** This Addendum, the Contract and any additional or supplementary documents incorporated by specific reference contain all of the terms and conditions agreed upon by the Parties and no other agreements, oral or otherwise, regarding the subject matter of this Addendum or any part thereof shall have any validity or bind either of the Parties.

15. **Severability.** If any provision of this Addendum is held to be unenforceable for any reason, the unenforceability thereof shall not affect the remainder of this Addendum which shall remain in full force and effect and enforceable in accordance with its terms.

16. **Waiver.** No waiver of any of the obligations contained herein shall be effective for any purpose unless the same shall be in writing signed by the Chairperson of the Incorporating Board of the Karegnondi Water Authority and by Mayor or Emergency Manager, or both upon the Flint City Council or Emergency Manager's approval, whichever is applicable.

17. **Construction.** This Addendum has been prepared and negotiations have occurred in connection with said preparation pursuant to the joint efforts of the Parties. This Addendum therefore shall not be construed against either Party.

18. **Amendment.** This Addendum may not be amended or modified except for by written agreement signed by both Parties.

19. **Certification of Authority to Sign Addendum.** The persons signing on behalf of each of the Parties certify by their signatures that they are authorized to sign the Addendum on behalf of such Party and that this Addendum has been authorized by such Party.

20. **Remainder of Contract.** Except as modified by this Addendum, the terms of the Contract shall remain in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have caused this Addendum to be executed and delivered by their respective duly authorized representatives as of the day and year first above written.

KAREGNONDI WATER AUTHORITY

By: _____
Dayne Walling, Chairperson of the Incorporating Board

ATTEST:

(OFFICIAL SEAL)

APPROVED AS TO FORM AND LEGALITY.

By _____
Kevin K. Kilby, Counsel for the Karegnondi Water Authority

CITY OF FLINT

By _____
Dayne Walling, Mayor

CITY OF FLINT

By _____
Darnell Earley, Emergency Manager

ATTEST:

Inez Brown, Clerk of the City of Flint

(OFFICIAL SEAL)

APPROVED AS TO FORM:

By _____

Counsel for Flint

This 1st Addendum was prepared by:

McGraw Morris P.C.

Attorney Kevin Kilby (P68599)

2075 West Big Beaver Road

Suite 750

Troy, Michigan 48084

(248) 502-4000

kkilby@mcgrawmorris.com

N:\GCDC\2155-1018 (Karegnond Water Authority)\Water Supply Contract\1st Addendum to Water Supply Contract with Flint draft
February 4 2014 (EXECUTION COPY) doc

**KAREGNONDI WATER AUTHORITY
ACTING IN GENESEE COUNTY, MICHIGAN**

RESOLUTION NO. 2014-02

A RESOLUTION APPROVING THE FIRST ADDENDUM
TO THE WATER PURCHASE CONTRACT BETWEEN THE
KAREGNONDI WATER AUTHORITY AND THE GENESEE COUNTY DRAIN
COMMISSIONER, AS COUNTY AGENCY, PURSUANT TO ACT 342 OF THE
MICHIGAN PUBLIC ACTS OF 1939, AS AMENDED DATED AUGUST 16, 2013,
AND EFFECTIVE ON OCTOBER 1, 2013

At a meeting of the Karegnondi Water Authority Board, acting in Genesee
County, Michigan, held on February 19, 2014, at 2:00 p m., local time.

PRESENT: _____

ABSENT: _____

The following preamble and resolution were offered by
_____ and seconded by _____:

PREAMBLE

WHEREAS, the Karegnondi Water Authority Board, by Resolution 2013-
02, approved a Water Purchase Contract between the Karegnondi Water
Authority and the Genesee County Drain Commissioner, as County Agency,

pursuant to Act 342 of the Michigan Public Acts of 1939, as amended, which is dated August 16, 2013, and effective on October 1, 2013 (hereinafter "Water Contract"); and

WHEREAS, the KWA Incorporating Board, KWA Authority Board, and the Genesee County Drain Commissioner, as County Agency, have agreed to modify the Water Contract by approving a written addendum pursuant to ARTICLE VII, Section 7.19 of the Water Contract; and

WHEREAS, the main purpose of the proposed written addendum is to allow the KWA to issue bonds for the construction of the water transmission main and all appurtenants thereto;

NOW, THEREFORE, BE IT RESOLVED THAT:

The Incorporating Board hereby approves the First Addendum, attached hereto and incorporated herein by reference, to the Water Contract ("First Addendum").

NOW, THEREFORE, BE IT FURTHER RESOLVED THAT:

The KWA Authority Board hereby approves the First Addendum to the Water Contract.

NOW, THEREFORE, BE IT FURTHER RESOLVED THAT:

The Chief Executive Officer and the Attorney appointed to represent the KWA may modify the First Addendum as long as the intent of the First Addendum adopted this day is not modified to diminish the authority of the KWA Board or its ability to accomplish the main purpose of the First Addendum.

ROLL CALL
VOTE:

RESOLUTION 2014-01 DECLARED ADOPTED.

Printed Name: Dayne Walling
Its: Chairperson of the Incorporating
and Authority Board

Printed Name: Steve Montle
Its: Secretary

STATE OF MICHIGAN }
 } ss
COUNTY OF GENESEE }

I Steve Montle, Secretary of the Karegnondi Water Authority Board, do hereby certify the foregoing is a true and complete copy of a resolution adopted by the Karegnondi Water Authority Board, acting in Genesee County, at a regular meeting held on February 19, 2014, and that public notice of said meeting was given pursuant to Act 267 of the Michigan Public Acts of 1976, as amended, including in the case of a special or rescheduled meeting, notice by publication or posting at least eighteen (18) hours prior to the time set for the meeting.

IN WITNESS WHEREOF, I have affixed my official signature on this ____
day of _____.

Printed Name: Steve Montle
Its: Secretary

*Prepared by
Janis M. Wells, Deputy Secretary*

**FIRST ADDENDUM TO
WATER PURCHASE CONTRACT BETWEEN THE KAREGNONDI WATER
AUTHORITY AND THE GENESEE COUNTY DRAIN COMMISSIONER, AS
COUNTY AGENCY, PURSUANT TO ACT 342 OF THE MICHIGAN PUBLIC
ACTS OF 1939, AS AMENDED, DATED AUGUST 16, 2013, AND EFFECTIVE
ON OCTOBER 1, 2013**

THIS FIRST ADDENDUM ("Addendum") to the WATER PURCHASE CONTRACT BETWEEN THE KAREGNONDI WATER AUTHORITY AND THE GENESEE COUNTY DRAIN COMMISSIONER, AS COUNTY AGENCY, PURSUANT TO ACT 342 OF THE MICHIGAN PUBLIC ACTS OF 1939, AS AMENDED, DATED August 16, 2013, AND EFFECTIVE ON OCTOBER 1, 2013 (hereafter the "Contract") is entered into effective _____, by and between the Karegnondi Water Authority, a Michigan Public Authority created pursuant to Act 233 of the Michigan Public Acts of 1955, as amended (hereinafter "KWA"), whose address is G-4610 Beecher Road, Flint, Michigan 48532 and the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended (hereinafter "County Agency"), whose address is G-4610 Beecher Road, Flint, Michigan 48532. KWA and GCDC are sometimes hereafter each referred to as a "Party" and collectively as the "Parties."

WITNESSETH:

WHEREAS, the Parties entered into a Water Purchase Contract, dated the 16th day of August, 2013, and effective on October 1, 2013;

WHEREAS, the Parties have agreed to enter into this Addendum for the purpose of modifying the Recitals; ARTICLE I, Section 1.02(17), and ARTICLE II, Section 2.06 of the Contract.

NOW THEREFORE, it is hereby agreed by the Parties as follows:

1. **Amendment to the RECITALS of the Contract.** Add the following recital to the RECITALS of the Contract:

WHEREAS, the Parties hereto acknowledge and agree that the intake system and the property where the two (2) pump systems may be acquired, constructed, is owned by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended.

2. **Amendment to the RECITALS of the Contract.** Add the following recital to the RECITALS of the Contract:

WHEREAS, the Parties hereto acknowledge and agree that the intake system and the property where the two (2) pump systems may be acquired and constructed was acquired and purchased by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended, and the County Agency shall be provided with a credit for the purchase and construction of the property and intake as annually in an amount equal to the aggregated debt service of the County of Genesee's Water Supply System Revenue Bonds (Limited Tax General Obligation) Series 2013 (the "County Bonds") as more fully set forth in Exhibit A to this Addendum. The County Bonds were issued in the original principal amount of Thirty-Five Million Dollars (\$35,000,000 00)

3. **Amendment to ARTICLE I, Section 1.02(17) of the Contract.** ARTICLE I, Section 1.02(17) of the Contract is hereby deleted in its entirety and replaced with the following:

(17) "System" means the long-range Water supply system authorized by this Contract, together with all improvements, enlargements, extensions and additions which, pursuant to this Contract, are deemed necessary and feasible by the Authority to provide Water supply as contracted herein to the Buyer from the point of withdrawal to the Point of Delivery; and, all future new facilities, which are acquired or constructed with proceeds from the sale of any bonds or revenues from the System; and, any water supply facilities which are deliberately and specifically, at the option of the Authority, made a part of the System by resolution of the Authority Board, and all repairs to or replacements of the System. The System is owned exclusively by the Authority and shall remain with the Authority. In the event that the Authority is dissolved the System shall be disposed of in a manner consistent with Article V of the Articles of Incorporation. Notwithstanding anything in this Contract to the contrary, the intake system and the property where the two (2) pump systems may be acquired, constructed, and owned by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended, through the issuance of the County Bonds.

4. **Amendment to ARTICLE II, Section 2.06 of the Contract.** ARTICLE II, Section 2.06 of the Contract is hereby deleted in its entirety and replaced with the following:

Section 2.06 Title of System. The title of the System shall be solely in the name of the Authority. The Buyer expressly agrees that it shall not have any claim to any portion of the physical infrastructure of the System used to provide Water capacity to the Buyer. The Buyer pursuant to this Contract shall only have rights to the amount of Water purchased. Notwithstanding anything to the contrary in this Contract, the Buyer at its sole expenses, with the full faith and

credit of Genesee County as security, has agreed to finance, acquire, design and construct the intake facility and acquire the property where the two (2) pump stations will be located through the issuance of the County Bonds.

The parties hereto express agree that the County Agency will receive an annual payment credit equal to the aggregate debt service on the above described bonds.

The Buyer hereby agrees that it shall receive a credit in an annual amount equal to the aggregate debt service of the County Bonds, as fully set forth in Exhibit A to this addendum. Upon the bonds being redeemed in their entirety, the Buyer agrees that it will have been reimbursed for the intake, the property, and any physical assets located on the property and it shall thereafter transfer ownership of the property, intake, and all assets, buildings and fixtures located on the property to the Karegnondi Water Authority. If the Buyer fails to deed the property, intake, and assets located on the property to the Karegnondi Water Authority within three (3) months after the bonds have been redeemed, or at a mutually agreed upon date and time after the bonds have been redeemed, or after it is brought to the attention of the Buyer that is required to deed the property, intake, and assets located on the property to the Karegnondi Water Authority, then the Buyer shall pay to the City of Flint in a lump sum payment of \$35,000,000.00 within sixty (60) days as a penalty and not as payment for the property.

Buyer further agrees to maintain the property and cooperate fully with the Karegnondi Water Authority, including, but not limited to, allowing authorized employees of Karegnondi Water Authority onto the property and access to any building or equipment deemed to be in the interest of the Karegnondi Water Authority

5. **Amendment to ARTICLE III, Section 3.04 of the Contract.** ARTICLE III, Section 3.04 of the Contract is hereby deleted in its entirety and replaced with the following:

Section 3.04 The Buyer expressly agrees that the Authority is responsible for furnishing Water to the Buyer and it may take several years after the execution of this Contract before Water is made available to the Buyer. Understanding that the goal of the Authority is to provide Water that benefits both the Authority, the Buyer, and the future needs of the Buyer, the Buyer shall pay to the Authority a good faith one-time fee of not less than thirty-two thousand three

hundred dollars (\$32,300.00) per Unit of Water purchased after October 1, 2013, but prior to October 31, 2013.

Additionally, to show its continued good faith, the Buyer shall pay to the Authority not less than thirty-two thousand three hundred dollars (\$32,300.00) per Unit purchased per year until such time as Water is made available to the Buyer. Said payments shall be made in monthly installments. The good faith payments are being used to secure a Water supply for the Buyer. As such, Buyer agrees that it is not entitled to any interest on the good faith payments made to the Authority. The good faith payments shall be credited to the Buyer, after Water is made available to the Buyer, over a time period determined by the Authority Board, not to exceed the term of this Contract. Said credits shall be applied to the monthly invoice sent to the Buyer by the Authority.

After Water is made available to the Buyer, the Buyer shall pay the cost per Unit per year for Water or the cost per Unit per year for Volume for Exempt Purposes in the form of a certified bank check or wire transfer. Said payments shall be made in monthly installments. The actual payment amount will be ultimately determined by the total number of Units sold and the amount of Units available for purchase. See Exhibit D. If the Authority determines after the System is designed and the estimated costs are confirmed that the anticipated cost of construction of the System will exceed the funds and assets from the proceeds of the County Bonds and bonds issued by the Authority and secured by a Contract between the City of Flint, the County of Genesee and the Authority dated as August 1, 2013, the Buyer shall have the right to cancel this Contract pursuant to Section 7.04 of this Contract.

6. **Amendment to ARTICLE VII, Section 7.04(b) of the Contract.** ARTICLE VII, Section 7.04(b) of the Contract is hereby deleted in its entirety and replaced with the following:

- (b) If the Authority Board determines that the cost of constructing the System will exceed the maximum amount provided in Section 3.04, provided, however, this right to cancel must be exercised before the Authority issues any bonds for the construction of the System.

7. **Notices.** Any notice, demand, or communication required, permitted or desired to be given under this Addendum shall be deemed effectively given pursuant to ARTICLE VII, Section 7.23 the Contract.

8. **Headings.** The headings of the sections set forth in this Addendum are inserted for the convenience of reference only and shall be disregarded when construing or interpreting any of the provisions of this Addendum.

9. **Complete Agreement.** This Addendum, the Contract and any additional or supplementary documents incorporated by specific reference contain all of the terms and conditions agreed upon by the Parties and no other agreements, oral or otherwise, regarding the subject matter of this Addendum or any part thereof shall have any validity or bind either of the Parties.

10. **Severability.** If any provision of this Addendum is held to be unenforceable for any reason, the unenforceability thereof shall not affect the remainder of this Addendum which shall remain in full force and effect and enforceable in accordance with its terms

11. **Waiver.** No waiver of any of the obligations contained herein shall be effective for any purpose unless the same shall be in writing signed by the Chairperson of the Incorporating Board of the Karegnondi Water Authority and by the Genesee County Drain Commissioner, as County Agency, pursuant to Act 342 of the Michigan Public Acts of 1939, as amended.

12. **Construction.** This Addendum has been prepared and negotiations have occurred in connection with said preparation pursuant to the joint efforts of the Parties. This Addendum therefore shall not be construed against either Party

13. **Amendment.** This Addendum may not be amended or modified except for by written agreement signed by both Parties.

14. **Certification of Authority to Sign Addendum.** The persons signing on behalf of each of the Parties certify by their signatures that they are authorized to sign the Addendum on behalf of such Party and that this Addendum has been authorized by such Party

15. **Remainder of Contract.** Except as modified by this Addendum, the terms of the Contract shall remain in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have caused this Addendum to be executed and delivered by their respective duly authorized representatives as of the day and year first above written.

KAREGNONDI WATER AUTHORITY

By: _____
Dayne Walling, Chairperson of the Incorporating Board

ATTEST:

(OFFICIAL SEAL)

APPROVED AS TO FORM AND LEGALITY:

By _____
Kevin K. Kilby, Counsel for the Karegnondi Water Authority

GENESEE COUNTY DRAIN COMMISSIONER, AS COUNTY AGENCY

By _____
Jeff Wright, Drain Commissioner of Genesee County

ATTEST:

(OFFICIAL SEAL)

APPROVED AS TO FORM:

By: _____

Counsel for the Buyer

This 1st Addendum was prepared by:
McGraw Morris P.C.
Attorney Kevin Kilby (P68599)
2075 West Big Beaver Road
Suite 750
Troy, Michigan 48084
(248) 502-4000
kkilby@mcgrawmorris.com

CITY OF DETROIT
WATER AND SEWERAGE DEPARTMENT
OFFICE OF THE DIRECTOR

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

April 17, 2013

Via Certified Mail and Electronic Delivery

Ms. Inez M. Brown
City Clerk
City of Flint
2nd Floor, City Hall
1101 S. Saginaw Street
Flint, Michigan 48502

Dear Ms. Brown:

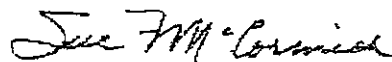
**Regarding: Termination of Contract for the Provision of Water Services
by the City of Detroit, Water and Sewerage Department**

On December 20, 1965, the City of Detroit, through its Board of Water Commissioners, (DWSD) and the City of Flint, Michigan (Flint) entered into a contract for the provision of DWSD treated water to Flint and the distribution by Flint of that water to other Genesee County communities. Section 18 of that Agreement¹ provides:

18. The Board [DWSD] shall supply and sell water to the City [Flint] from the water system of the City of Detroit, and the City shall receive and purchase such water in accordance with the terms of this Agreement for an indefinite period of time but at least for a period of thirty-five (35) years from the date hereof. This Agreement may be terminated by either party after expiration of said 35-year period, upon one year's written notice served upon the other party by delivering the same to the Secretary of the Board or to the Clerk of the City as the case may be, or at any time upon mutual consent of both parties.

Please take notice that pursuant to this section, 18, of the above-referenced Agreement, DWSD is terminating this Agreement one year from today's date (April 17, 2014).

Sincerely yours,


Sue F. McCormick
Director

¹ Although the Agreement between DWSD has been subsequently amended, Section 18 remains unchanged and in full effect.

RECEIVED
CITY OF FLINT
CITY CLERK'S OFFICE
2013 APR 18 AM 11:33

Widigan, Robert (TREASURY)

From: Koryzno, Edward (Treasury) <KoryznoE@michigan.gov>
Sent: Thursday, April 24, 2014 4:37 PM
To: Cline, Richard (Treasury), Dube, Mathieu (Treasury), Vandegrift, Drew (TREASURY),
Widigan, Robert (TREASURY)
Cc: Dempkowski, Angela (Treasury)
Subject: FW: MEDIA ADVISORY: Flint River Water Transition Event

FYI



Edward B. Koryzno, Jr. | Director - Bureau of Local Government Services
State of Michigan | 430 W Allegan Street, 3rd Floor | Lansing, MI 48922
(517) 373-4415 | (517) 373-0633 (fax)
KoryznoE@michigan.gov



Think Green! Don't print this e-mail unless you need to

CONFIDENTIALITY NOTICE. This e-mail, and any attachments, is for the sole use of the intended recipient(s) and may contain information that is confidential and protected from disclosure under the law. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail, and delete/destroy all copies of the original message and attachments.
Thank you

From: Jason Lorenz [mailto:jlorenz@cityofflint.com]
Sent: Thursday, April 24, 2014 4:33 PM
Subject: MEDIA ADVISORY: Flint River Water Transition Event

MEDIA ADVISORY:

City of Flint Transition to Flint River Water Ceremony

WHERE: Flint Water Treatment Plant, 4500 N. Dort Hwy. by Stewart Ave.

WHEN: Friday, April 25, 2014 at 2:00pm

Description: The City of Flint is holding a ceremony tomorrow to officially begin the transition to use of the Flint River by shutting the valve to the intake pipe from Detroit.

The DEQ has given Flint final authorization to begin water distribution from the Flint Water Treatment Plant. City, Genesee County, and Michigan Department of Environmental Quality officials will be on hand to witness this historic event and answer media questions.

-Jason Lorenz
Public Information Officer
City of Flint
(810) 237-2039
jlorenz@cityofflint.com

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

City of Flint Did Not Meet Treatment Requirements

Our water system was recently found to be in violation of 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 ug/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. In that case, you may be at increased risk and should seek advice about drinking water from your health care provider.
- 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.

For more information, please contact Mr. Brent Wright or Mike Glasgow at 810-787-6537 or the Water Plant at 4500 North Dort Highway, Flint, MI 48505.

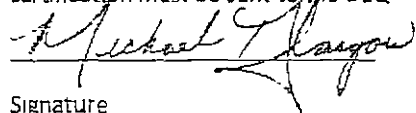
Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by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

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

CERTIFICATION: F1 S3

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



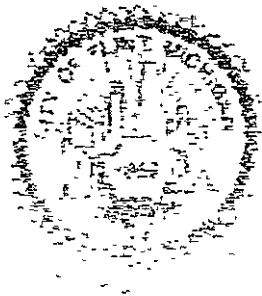
ASSISTANT SUPERVISOR

1/2/15

Signature

Title

Date Distributed



CITY OF FLINT
OFFICE OF THE EMERGENCY MANAGER

Attachment #20



Gerald Ambrose
Emergency Manager

TO: Wayne Workman, Deputy Treasurer
Treasury Department
State of Michigan

FROM: Jerry Ambrose, Emergency Manager
City of Flint

DATE: March 3, 2015

As the Emergency Manager for the City of Flint, I am charged with restoring the City government to financial solvency, and working to assure that the City moves forward on a financially sustainable basis. The steps taken over the past three years have been difficult. Taxes and fees have been raised, services and workforce reduced, and ongoing costs, including legacy costs, have been constrained.

The current controversy surrounding the provision of water, and the path for resolution, has a potentially significant impact on the progress that is being made. I am satisfied that the water provided to Flint users today is within all MDEQ and EPA guidelines, as evidenced by the most recent water quality results conducted for MDEQ. We have a continuing commitment to maintain water safety and to improve water quality, and have dedicated resources to assure this commitment will be made.

The oft-repeated suggestion that the City should return to DWSD, even for a short period of time, would, in my judgment, have extremely negative financial consequences to the water system, and consequently to the rate payers. By the most conservative estimates, such a move would increase costs by at least \$12 million annually, with that amount achieved only by eliminating virtually all budgeted improvements in the system. For a system with Unrestricted Assets of only \$740,745, according to the June 30, 2014 audited financial statements, the only recourse within the City's control would be to increase revenues significantly. And in my judgment, that would come from raising rates for water by 30% or more. Further, changing the *source* of the city's water would not necessarily change any of the *aesthetics* of the water, including odor and discoloration, since those appear to be directly related to the aging pipes and other infrastructure that carry water from the treatment facility to our customers.

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This direction of discussion also deviates from what, in my judgment, should be the focus: How can we not only operate and maintain a system to assure the delivery of safe and quality water dependably, but significantly reduce the cost of water and sewer to the users? At an average of \$149 per month for water and sewer service for a residential user, the cost is extremely high in comparison to surrounding areas, as well as most areas across the state, and creates a significant financial burden for many users. In my judgment, we should all be concentrating on how to reduce rates by 50% or more. Unfortunately, there are no easy or evident answers, and continuation of the status will be an impediment to the sustainable recovery of the City of Flint. It is a conversation that I expect we will have with the recently created Water Quality Advisory Committee.

My reasoning for this conclusion is as follows:

One of the decisions made in the context of beginning to eliminate deficits and to restore financial stability to the City of Flint was to increase water and sewer rates significantly – the only choice available to financially stabilize a system that as of June 30, 2012, had a deficit of \$8,758,091. Another was to leave DWDS for the KWA because it offered the opportunity to lower future rate increases. A third decision was to utilize the Flint River on an interim basis when DWSD unilaterally terminated the City's contract for water purchase. That decision was made because it also offered an immediate cost savings opportunity which translated into the ability to upgrade the Water Treatment Plant without having to seek financing. It was a reasonable decision because of our experience in using the river in a back-up capacity, including test runs on a quarterly basis for several decades.

Unfortunately, the switch to the river as a primary source was more challenging than anticipated, and the harsh winter of 2013-2014 resulted in much more damage to the aging water infrastructure than in previous years. The result was the issuance of required notices that water exceeded established guidelines for safety as it could affect certain vulnerable populations, and some users of the system experienced unpleasant odors and discoloration. Some users also appeared to have had some negative reactions to the new source of water. However, as soon as the test results were known, City staff took immediate actions to address the concerns. These actions are evidenced today by the fact that MDEQ has certified that our most recent testing shows water from all testing sites to be well within acceptable guidelines. Additionally, the City is continuing to taking the necessary actions to assure that the water supply remains safe and that water quality continues to improve.

As the City has moved to address the situation, the suggestion continues to be made that the City should re-engage with DWSD and purchase water at least until the KWA pipeline is supplying water. As evidenced by the most recent letter from DWSD, such a decision would immediately increase the City's cost by \$846,700 per month, or \$10,160,400 per year, just for the fixed cost portion of the price. The actual *purchase* of water would be an additional fee, and dependent upon

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the quantity purchased. We estimate the actual water purchase cost to average more than \$1 million per month, for a grand total of approximately \$22 million per year. Finally, the DWSD offer is conditioned upon the City (or presumably the KWA) agreeing to negotiate a long term contract (30 years) for back-up.

The \$22 million annual estimate of increased costs to purchase water from DWSD would be minimally offset by an approximate \$3 million in reduced operating costs, and could be further offset by an additional \$9 million, but only if all funding for capital improvements to the system are eliminated. To eliminate all funding dedicated to repairing, stabilizing, and improving the system would be totally irresponsible and would have long term negative consequences to the City and to future rate payers.

As you are aware we have recently brought in outside expert assistance to evaluate the steps we have taken to assure that the water is safe and to continue to improve water quality. We are expecting specific recommendations within the next few weeks, and are committed to implementing those recommendations in a timely manner. Many steps have already been taken. I am confident that implementing their recommendations will assure a continuing supply of safe water as well as improved quality, and at far less cost than re-engaging DWSD.

We have also created a 40-member Water Advisory Committee and a 13-member Technical Advisory Committee to assure two-way communication with the public and users of the system. Those committees will begin to meet this week, and we look forward to answering their questions and receiving their input.

It is unfortunate that problems and concerns with quality have arisen, and we are working every day to address the issues that caused them. Maintaining safe water and improving quality is a top priority as we work to make the City of Flint an attractive place to live, work, study, and play.



STATE OF MICHIGAN
Water Quality Report

Water quality report

- > Executive Summary
- > Review of actions taken to date
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- > Conclusions and next steps
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Water Quality Report

March 12, 2015

FROM

Veolia North America

TO

Emergency Manager Gerald Ambrose

Executive Summary

The City of Flint changed water sources, transitioning from Detroit's system to the Flint River. This change created water treatment challenges that have resulted in water quality violations. Aging cast-iron pipe has compounded the situation, leading to aesthetic issues including taste, odor and discoloration. Public interest and scrutiny of the drinking water system intensified following the distribution of required public notices of violation.

The City of Flint has made a number of good decisions regarding treatment changes that have improved water quality. However, this is a very complex water quality issue and the City is seeking additional advice on what to do to ensure healthful drinking water for the community.

Veolia appreciates the City's decision to seek independent third parties to review current treatment processes, maintenance procedures and actions taken to date, and provide ideas for improvement. We are pleased to present this final report to the City of Flint following our experts' 160-hour assessment of the water treatment plant, distribution system, customer service and communications programs, and capital plans and annual budget.

This report provides recommendations and a roadmap for improvement, though our engagement was limited in scope. Our assessment included reviewing actions taken by the City to date, validating the City's plans going forward, and making recommendations for ideas not being considered.

Although a review of water quality records for the time period under our study indicates compliance with State and Federal water quality regulations, Veolia, as an operator and manager of comparable utilities, recommends a variety of actions to address improvements in water quality and related aesthetics including operational changes and improvements, changes in water treatment processes, procedures and chemical dosing, adjustments in how current technologies are being used; increased maintenance and capital program activities, increased training; and, an enhanced customer communications program.

We are also providing a recommended schedule and estimated costs for implementing changes. It is our desire to help Flint residents and public officials better understand the current situation so that informed decisions can be made to ensure safe drinking water for the city's customers.

Review of Actions Taken to Date

To address water quality issues, the city has made operational changes, sought help from the State, hired engineering firm Lockwood, Andrews & Newnam, Inc. (LAN) to provide additional advice, and hired Veolia for an assessment from a utility operator's perspective. The City has also reached out to different specialty vendors (chemical suppliers, filter companies and tank aeration companies) for information about products to help with the TTHM issues. These are logical steps to take.

Flint is not alone in dealing with TTHM problems, as many utilities across the country are facing this challenge. The City appears to be following standard steps that many of those communities are taking to successfully correct the problem.

Although the primary focus of this review was based on solving the TTHM problem, the public has also expressed its frustration over discolored and hard water. Those aesthetic issues have understandably increased the level of concern about the safety of the water.

The review of the water quality records during the time of Veolia's study shows the water to be in compliance with State and Federal regulations, and, based on those standards, the water is considered to meet drinking water requirements.

The City has been proactive in its efforts to reach out to the medical community, to set up a phone number and email address to receive complaints, to post State Water Quality reports, to provide the list of EPA required water tests, and offer to test the water at customers' homes.

From our review, these numerous efforts demonstrate how the city is trying to be transparent and responsive beyond what many other communities might do in similar circumstances.

State Report

The Michigan Department of Environmental Quality (MDEQ) has requested specific actions be taken related to the total trihalomethane (TTHM) issues. The February 2015 report from LAN (*Operational Evaluation Report TTHM Formation Concern*) indicated apparent reasons for the elevated levels of TTHM in the distribution system. These generally relate to high Total Organic Carbon (TOC) in the water source, improperly operating equipment both in the plant and the distribution system, less-than-optimal plant TOC removal and old cast-iron pipe in the distribution system. Our assessment confirms that these reasons are likely given our on-site laboratory testing and analysis, as well as our first-hand observations.

Due to time constraints, LAN's report to the State was submitted prior to Veolia's final analysis and recommendations, and contained a number of key initial and contingent steps the City should consider, including

Initial Actions

- Hire a Third Party Water Quality Expert to Complete Independent Audit
- Obtain a THM Analyzer
- Carry Out Jar Testing
- Water Plant Optimization Softening
- Water Plant Optimization Disinfection of Filter Beds (Pre-Chlorination)
- Water Plant Optimization Polymer Aid to Coagulation and Flocculation
- Increase Water Main Flushing
- Water Modeling Cedar Street Pump Recirculation
- Water Modeling West Side Pump Recirculation
- Broken Valve Locations
- Increase Flushing

Contingent Actions

- Fix Ozone System
- Start Feeding Coagulant and Flocculation Polymer
- Convert to Lime and Soda Ash Softening
- Change Disinfection to Chloramine or Chlorine Dioxide Temporarily
- Install Pre-Oxidant at Intake
- Replace Filter Media Implement Advanced Treatment
- Increase Main Flushing
- Continue Valve Replacement
- Emphasize Cast Iron Pipe Replacement

Veolia's Recommendations

While many of Veolia's recommendations match the initial assessment provided by LAN, our approach, as an operator and manager of comparable utilities, considers a more comprehensive solution. These improvements include operational changes, differences in water treatment regimes and chemical dosing, increased maintenance, and increased training.

- **Addition of Permanganate** – The addition of a permanganate chemical will help reduce ozone demand as well as chlorine demand. The reduction of ozone is needed to help eliminate the possibility of violating the bromate limit. The addition of the chemical will require state approval, submission of design documents for approval, procurement of the equipment and installation. The State has indicated they will work with the City on expediting review and approval of any requested changes. The required dosage of permanganate is estimated to range from 0.5 mg/L to 1.2 mg/L with a corresponding price of \$160,000 to \$320,000 per year. (Please note – The water in the river is dynamic which means it will change with weather, seasons and other factors. The estimates provided are based on bench testing at a given time and as such require the operators to test water and to verify chemical dosages on a frequent basis.)
- **Reduction of Ozone Feed** – Treating water is a delicate balance - increasing ozone to fix the TTHM problem can raise bromate levels to a point of violation. The introduction of permanganate is being recommended to reduce the demand for ozone so that feed rates will not exceed 5 mg/L. The current ozone dosing has been as high as 8 mg/L and, as such, if allowed to continue, will increase the risk of violating the bromate levels.
- **Increase of Ferric Chloride** – Four coagulants were tested by Veolia - ferric chloride, ferric sulfate, polyaluminum chloride (PACl) and aluminum chlorohydrate (ACH). Ferric chloride and ACH were found to be the best choice of product for effectiveness in removing TOC, a precursor to TTHM formation. Current ferric chloride dosages are too low and dosages of 100 mg/L or more are recommended. Again, please note, that the amount of chemical needed changes with the nature of the river and as such, water must be tested multiple times a day with corresponding changes in chemical dosages. This increase to 100 mg/L is twice what is currently being fed and much higher than what had previously been fed last year. The increase in chemical costs could be up to \$1,000,000 per year. This change in dosage (using ferric chloride) can be made immediately without state permit review.
- **Reduction of Lime** – Lime is currently being overfed. A higher dosage of lime does not necessarily mean better treatment. A review of different dosages with jar testing indicates that the current dosage of 280 mg/L can be reduced to 230 mg/L. This represents a potential range of savings of up to \$270,000 per year. This change can be made immediately. It should be noted that the current softening equipment is in poor condition, which does complicate the treatment process with a poor balance of flow between the two basins, weirs that are not level causing bypassing with the softener basins, and simply old mechanical equipment that periodically breaks down. This equipment is not going to be needed when a change to lake water occurs. Addition of soda ash to help further reduce hardness in cold weather might require dosages up to 40 mg/L with an annual chemical cost up to \$320,000. There have also been some questions or complaints from the public regarding hard water. The water entering the plant is currently 360 mg/L and the plant is reducing that level of hardness to about 210 mg/L. Optimization of the dosage can reduce the hardness.

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further to about 180 mg/L. This reduction however has been sporadic as equipment breakdowns and high flows have caused problems keeping the softening process on-line. As we have noted before, the dosage needs to be adjusted daily or more often based on process control monitoring. The raw water hardness in the summer is much less than in the winter. For illustration purposes, the difference could be 360 mg/L in raw water in winter compared with 220 mg/L in the summer.

- **Eliminate Pre-Chlorination on the Filters** – The reduction of pre-chlorination on the filters during the summer months can help reduce TTHM formation. This action has to be considered carefully with procedures documented and reviewed for engineering principles. As such, it will take time for the design engineer to determine what could be done to assure the proper chlorine contact time and document that other safety protocols in water are met. This requires state approval. Any submission should be considered along with a possible change in filter media. If Granulated Activated Carbon (GAC) is installed then the pre-chlorination would be stopped or drastically reduced because of the chlorine impact on the GAC filter media. Veolia's initial investigation into changes in chlorine feed point indicate that the recommended action can be accomplished while maintaining the required regulatory contact time for disinfection.
- **Change Filters to Granulated Activated Carbon (GAC)** – The object of the other changes being made is to reduce the TOC before chlorine is added into the process. The plant by design is limited on the amount of TOC removal possible. A maximum removal of only 60% is likely if the plant is properly optimized. The change of filter media to GAC would provide the best reduction possible and provide better than 90% removal dramatically reducing the potential for TTHM formation and thus ensuring compliance with that parameter for the water system. The change in filter media, however, is complicated requiring approval by the state, design of the changes, procurement of the media and a contractor to install it. That will take time and is likely in a range of \$1.5 million (more or less) in cost. The use of GAC also requires more testing and monitoring of the media and the TOC than with the current media. GAC will accumulate TOC and begin to become ineffective after a period of time. Depending upon the level of TOC reaching the filters this could be as short as 3 months and as long as 9 months. The amount of TOC is dependent upon the river water quality and operation of the other plant processes. Once the ability of the filters to remove TOC is diminished, the GAC media has to be replaced if river water continues as a source. The change to lake water will not require TOC removal and the media could continue to be used as filter media for that new water source.
- **Corrosion Control** – The primary focus of this study was to assure compliance with the TTHM limits. That is not the only problem facing the city and its customers though. Many people are frustrated and naturally concerned by the discoloration of the water with what primarily appears to be iron from the old unlined cast iron pipes. The water system could add a polyphosphate to the water as a way to minimize the amount of discolored water. Polyphosphate addition will not make discolored water issues go away. The system has been experiencing a tremendous number of water line breaks the last two winters. Just last week there were more than 14 in one day. Any break, work on broken valves or hydrant flushing will change the flow of water and potentially cause temporary discoloration.
- **Eliminate a Storage Tank** – The water system has more storage than it requires, due to excess capacity in the water lines in combination with the storage tanks. The City has already employed LAN to update the hydraulic model. The hydraulic model should be used to help determine if water levels can be lowered further and even to remove some storage tanks from service. That decision may need to be made.

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seasonally. For example demand during water main breaks last week required extensive amounts of water. The excess storage is more a problem with TTHM formation for the system in summer than winter.

- **Prioritize Valve Replacement** - The hydraulic model shows long water age in portions of the system that appear to be contributing to the TTHM problems. LAN has updated the model to include the location of broken valves and that added information is being used to identify other system problems. The City has a contract for valve turning and repair work that should be focused on known broken valves, particularly in sections of the distribution system with old water age. This activity however must wait until warmer weather in fear of causing problems in the water system with lines freezing.
- **Target and Increase Flushing** - Flushing the fire hydrants can be useful in cleaning out lines to minimize discolored water complaints and also helping reduce the age of water. This DOES NOT mean just opening hydrants. The hydraulic model needs to be used to determine which hydrants should be opened and for how long to ensure the lines are properly cleaned. For example, this might require 15 minutes or even several hours of flushing depending on location. The flushing of hydrants also needs to include records of hydrant condition, color of water initially and after periodic increments plus chlorine residual testing. All of that information will help provide information to the engineers on the effectiveness of the procedure. Each crew doing the work should be trained to help explain the process to the public and also warn neighborhoods about flushing so that staining of laundry can be avoided.
- **Change to Lake Water** - The changes being made now to the water plant will not be the same changes required to treat lake water once it becomes available. A thorough analysis and plan needs to be made in preparation of that switch. This is going to need to include changes in how the plant is operated, like eliminating lime softening and reducing the dosages of many chemicals. Consideration will also have to be given to algae treatment when lake water is being used.
- **Operating Programs** - All of the changes discussed above are based on testing and techniques proposed by engineers and skilled operators of both LAN and Veolia. The staff will need further training and implementation of detailed protocols to successfully implement the changes and to ensure long-term success at the plant. This means the City needs to implement a series of programs to ensure success in these changes.
 - **Process Control Management Plan (PCMP)** - The amount of testing and resulting changes in chemical dosages, along with monitoring the impact on the water, will require a well-documented process that all operators follow. An example of this is jar testing, which is used by the operators to identify the most effective chemicals and dosages to optimize treatment. The staff understands the basic treatment process but needs further practice and training to become proficient in the use of routine process control to adjust for water quality. This is commonly referred to as a PCMP and is used as a standard operating procedure so that the operators on the day shift can communicate with the night shift, that operators are following the same treatment plan for water, that the adjustments are unified between different shifts and different people, that a desired water treatment quality is defined and variations from it signal alarms and that the staff knows what to do when the water quality setpoints begin to drift away from its desired quality levels.
 - **Lab QA/QC** - The operation of the water plant is dependent upon accurate lab results. Standard operating procedure needs to be set and lab technicians trained in that process. EPA and the State

set procedures and standards to be met and the staff should strive to meet those standards. The City has already purchased a TTHM analyzer but should also consider a TOC analyzer that can be an online continuous device to provide immediate information on influent and effluent levels of TOC. Part of the lab records should be historical review of data to help operators better understand the changes they make in the plant.

- o **Maintenance Management** – The key to water equipment is having all the equipment effectively maintained and functioning properly. The current capital program is fixing many broken pieces of equipment and updating the plant to current standards. This however must be followed with a rigorous maintenance program that ensures the proper preventive maintenance, is able to predict when maintenance is needed to keep equipment functioning properly and responsive to changes in flows and source water quality.
- o **Training** – The changes being suggested are new to the staff and as such training needs to be provided in what the changes involve, why they are being made, the impact on the water quality, and how best to run the plant. A good demonstration of skill level is for the staff to become certified by the State as a licensed water plant operator. Many utilities now require all operators to hold at least the minimum certification level as a starting point and offer incentives to increase their certification level.
- **Communication Program** – The city should lay out an immediate, written strategy for communicating with the public in the short-term, as well as a 6-to-12 month strategy that contemplates known, future events like the KWA pipeline and switch to lake water. A wide range of activities are underway to work with the public but a comprehensive and coordinated effort, with a strategic focus, will help the utility and its customers.
 - **Dedicated Communications Personnel** – The City has a single, dedicated public information officer, tasked with providing service to all of city government. The current focus on communications support for Public Works, and the anticipated needs over the next several years, indicate the city would benefit from the hiring of a staff person in Public Works who could establish a communications program designed to provide clear and concise information to a broad audience through a number of different channels. In the interim, the city could hire a communications intern, local communications firm, or somebody with experience who is able to provide reduced or no-cost services for the immediate future.
 - **Communications Planning – Public Notification** – The City should be congratulated on its efforts to keep the public informed. It is posting its monthly reports on the web page to provide transparency, though these reports are highly technical – and may be too technical for the customer base at large. They are valuable to those customers who do want this level of detail. The city should create a single-page dashboard of information that outlines the water utility's performance for the previous month, post the dashboard on the website, print copies for distribution at customer service or other reception areas, and be provided during speaking engagements or other events. This dashboard should be easy to understand, and include
 - o The number of water quality tests conducted the previous month
 - o The number of violations reported

- c Whether these results are in or out of compliance
 - o Information about other proactive measures such as main and hydrant replacements, or other programs to improve performance of the water utility
 - c Benchmarking information so the reader has a greater understanding of how Flint compares with other similar utilities in the region and across the country
- **Public Meetings** – There should be additional, proactive coordination with neighborhood, community and civic groups to provide speakers on timely topics. Given the list of numerous responsibilities, the Public Works director cannot do it alone – the city should identify three or four other staff members, knowledgeable about the water utility who can also speak to various groups, provide information and answer questions. The development of an outreach strategy to target key neighborhood, community and civic groups also will advance the communications effort and the dissemination of information in both the short and long term.
- **Standard tools** – Work crews in the field are often the faces of the utility – the city should create standardized tools for communicating with the public that can be easily and quickly delivered to the community in the event of main breaks, flushing or pre-planned capital improvements. Tools should include
 - c Door hangers for individual distribution
 - o Yard signs with simple messaging to be placed near work-sites
 - o A simple tri-fold brochure with useful information about the utility and appropriate contact information
 - o Specific flyers about a range of topics
 - o Infographics about how the water system works, from the intake to the customer's site
- **Change in Billing Format** – The City currently has no real way to reach all customers on a regular basis and provide information. The city should consider changing from a billing postcard to using an envelope and bill stuffer. Monthly or bi-monthly bill inserts are typically used to provide educational material for customers and are standard ways to provide information. Understandably, budget considerations must be taken into account.
- **Use Public Affairs Programming and Opportunities** – The news media has been covering this topic quite extensively – there are other media-related opportunities that may reach a wider audience. Taking advantage of these opportunities will help the city relay information to its customers and the community.
 - o Participate in regular editorial-board meetings to provide background information and updates on key milestones or events
 - o Identify a local weekly television program and offer to provide guests to speak about key milestones or upcoming events

Conclusions and Next Steps

The focus of this report is to help assure TTHM compliance and then improve general water quality. The City had good results in its most recent TTHM tests, although that is to be expected with the changes made to date and the cooler weather which contributes to low TTHM formation. Warm weather will be a different situation both in the nature of the Flint River water quality and in the formation of TTHM. With those changes coming, the City needs to act quickly to make improvements before additional testing takes place this spring and summer. The summary below provides the recommended actions, a priority for their implementation and projected costs either operational or capital. The costs are rough orders of magnitude and will vary with changes in water quality, operational decisions, and engineering choices being made and in some cases require State approval. Although a priority is assigned many of these actions can take place simultaneously.

Priority	Action	Annual Operational Cost	One Time Capital Cost
1	Implement operating programs for process control, lab QA/QC, maintenance, and training. These programs are needed regardless of the TTHM issue and will help with transition to lake water. The City has decided upon a central maintenance software and the water system should be the first to utilize this program since costs are already budgeted. These programs should be initiated immediately.	\$ 25,000	\$ 250,000 - \$ 350,000
2	Contract with your engineer and initiate discussions with the State on the reduction of chlorine prior to the filters and changing the filter media to GAC. This activity has the longest time frame for design and approval, but also is extremely critical to assuring reduced TTHM production. The current filter cleaning and maintenance project needs to be adjusted to take into consideration the change in filter media both to dispose of the anthracite instead of cleaning and to install the GAC. This entire project needs to be done by early July to assure a flow of water throughout the system. Several months are required for the engineering design, State approval, bidding of work and installation of GAC and as such needs to begin now.	\$ 0	\$1,500,000
	Contract with your engineer and initiate discussions with the State on the addition of 0.5 to 1.2 mg/L of either potassium permanganate (dry) or sodium permanganate (liquid). This will take time to get approved and to implement. The use of liquid tanks at the raw water pump station may be the quickest and least expensive alternative for a temporary measure.	\$ 160,000 - \$ 320,000	\$ 50,000

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	Contract with your engineer and initiate discussions with the State on the addition of a corrosion control chemical. This action can be submitted and discussed with the state at the same time as the other chemical and filter changes saving time and effort. A target dosage of 0.5 mg/L phosphate is suggested for improved corrosion control	\$ 50,000	\$ 50,000
3	Increase the ferric chloride dosage to 100 mg/L depending on river water TOC levels. (Lower TOC levels can be treated with less ferric chloride.) This change can be made now and is allowed by the State	\$ 1 000,000	\$ 0
	Reduce the ozone feed rate to 5 mg/. This change can be done now and does not require State approval	(\$50,000 – \$100,000)	\$ 0
	Reduce the lime dosage to minimize hardness levels after softening. This will eliminate magnesium removal during treatment, but will also reduce total hardness. A reduction in carbon dioxide dosing for recarbonation treatment also is expected due to the reduction in lime feed. This change can be made now and does not require State approval	(\$270,000)	\$ 0
4	Confirm with the engineer when the revised hydraulic model will be completed and if necessary for time to focus on areas of longest water age if that would speed up the effort. Identify impact of reducing tank levels or eliminating a tank seasonally to improve water age. Include with this effort a list of hydrants to flush along with time required to assure drawing fresh water through the system. The engineer has been assigned this task already and confirmation of the timing of a delivery is needed	\$ 0	Already Contracted
	Ask the engineer to identify closed valves on a map that are impacting water age and that can be bid for replacement as soon as weather permits. Have the engineer identify areas of the system where the valve contractor should be focused on finding and fixing closed valves	\$ 0	Already Budgeted
5	Implement the recommendations in the communications program including a person assigned to public works education, using envelopes instead of cards along with bill stuffers for education and provide training for staff. Envelopes and bill stuffers are expensive and might be done periodically and not every month. The cost of TTHM notices, Annual Water Quality Reports and City notices should be figured into if any additional costs would exist. Many of these changes are underway now by the City	Position Being Budgeted	

Notes

- The costs provided are rough order of magnitude which final engineering will firm up but will fluctuate with final decisions on engineering, operating technique and water quality
- The change from river to lake water will dramatically cut the chemical costs as less is needed once the change occurs. This means that potassium permanganate will likely not be needed, ferric will drop as much as it went up, ozone levels will be lower and little lime will be needed

Results Expected

The real question is what changes can be expected from these results in lowering the TTHM, improving the aesthetics and preparing for the change to lake water

- **TTHM** – The City has already made great strides in reducing the TTHM levels with the changes already made. The additional suggestions by Veolia will further reduce TTHM in the water and help get the city released from the notices being provided to customers
- **Hardness** – The hardness entering the plant this winter is 360 mg/L with the current system reducing it to 210 mg/L and optimization will reduce to about 180 mg/L. During the summer the levels will be lower probably in the 140 mg/L to 150 mg/L range. The target set by the current best operating practices is 120 mg/L to 150 mg/L
- **Discolored Water** – The discolored water is caused by the old unlined cast iron pipe. The water from the plant can have an impact on discolored water, but a greater concern is the breaks and construction work that disrupt the flow of water causing discoloration. A polyphosphate is suggested to help bind the old cast iron pipe reducing instances of discolored water. This along with improve flow of water and programmed hydrant flushing will help, BUT WILL NOT eliminate discolored water occurrences
- **Change to Lake Water** – The recommendations include the suggestion of programs to help the staff better manage the treatment process, additional testing to adjust the plant and additional lab monitoring, a maintenance program focused on keeping equipment properly functioning and more training for staff to improve their skill level. Those actions will prepare the staff for the change of water sources when it comes next year in addition to developing a thorough plan for the switch

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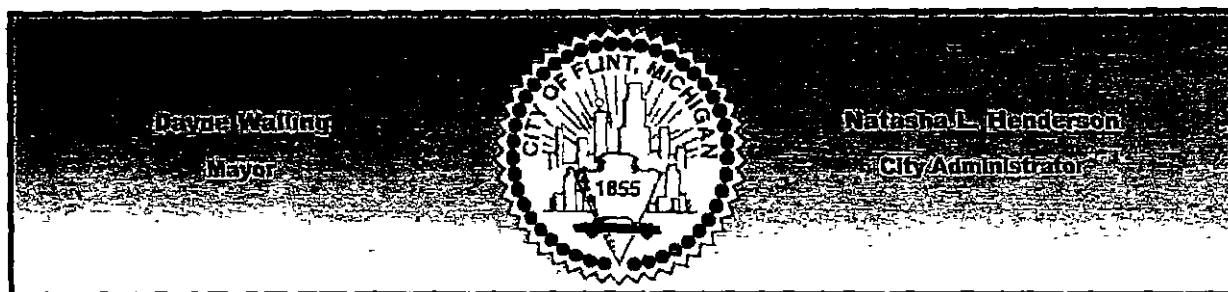
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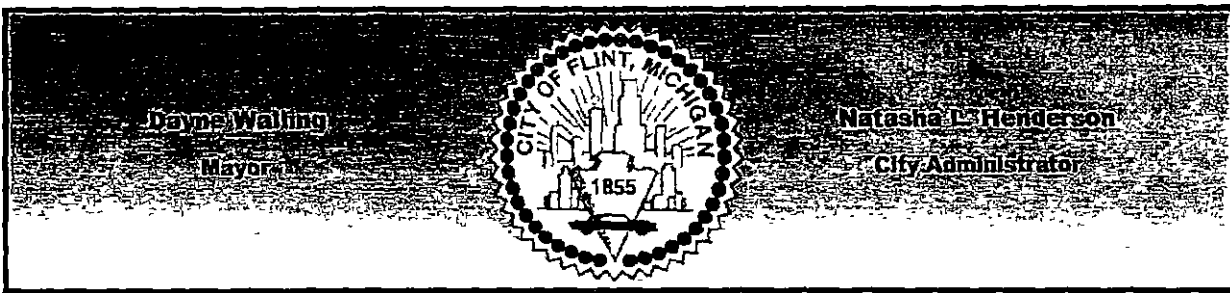
MDEQ Testing of City of Flint Water Shows TTHM Levels are Well Below the Required Action Level, City No Longer in Violation

Flint, Michigan – September 3, 2015 – The City of Flint has made significant improvements to its water treatment process and distribution system. Annual average results show all locations are within acceptable limits for total trihalomethanes (TTHM) and work continues to ensure that the average stays below the acceptable level. Flint's TTHM levels have now been below the actionable level for four consecutive quarters, long enough to bring the City out of violation with the Safe Water Drinking Act.

Installation of the Granulated Activated Carbon filter mediums in July has had a significant impact on the reduction of total organic carbon (TOC) and is expected to continue to do so. TOC contact with chlorine can lead to the creation of the chemical byproduct trihalomethanes. By reducing the amount of TOC in the treated water, the amount of TTHM in the water fell as a direct result.

"The City of Flint is continuing to improve its water system including both the areas of treatment and distribution," said Mayor Dayne Walling. "As the issue of trihalomethanes comes under control and the City is no longer in violation of safety standards, it will work with the MDEQ on implementing water optimization measures to reduce the corrosive effects of water on older pipes and home service lines." Older pipes and service lines can contain lead solder which can leach into the water over time.

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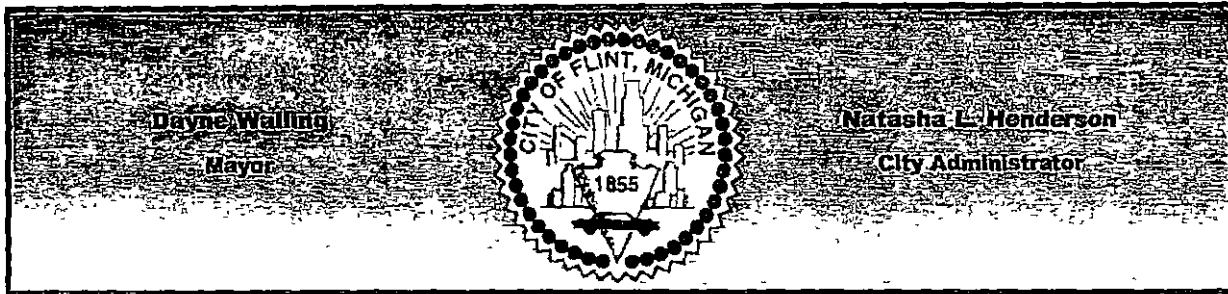


Flint has been looking at the water optimization option for some time and is now looking at taking accelerated steps toward implementation. According to the MDEQ, a typical water optimization plan can take up to five years to complete, as in the case of the Detroit Water and Sewerage Department. The City of Flint plans to have its water optimization measures in place by the beginning of 2016. This measure, combined with the ongoing improvements to the distribution system wherever possible, will improve water quality and extend the performance of the City's aging infrastructure.

"The City of Flint has been in constant communication with the MDEQ in our continuing efforts to upgrade and improve our water system," said Director of Public Works Howard Croft. "We have received assurances from them that every step we have taken has been in line with their recommended actions. The City will continue to work to ensure safe, quality water to its residents, businesses and visitors."

The City of Flint will continue to provide updates on its water progress through its website, cityofflint.com. Anyone with water issues is encouraged to call 810-766-7202 so that they can be addressed. Residents wishing to receive a free and independent in-home water test can call 810-787-6537 or email flintwater@cityofflint.com.

-END-



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For Immediate Release

City of Flint Issues Lead Advisory

Flint, Michigan – September 25, 2015 – The City of Flint is issuing a Lead Advisory for residents to be aware of lead levels in drinking water after hearing concerns from the medical community. While the City is in full compliance with the Federal Safe Drinking Water Act, this information is being shared as part of a public awareness campaign to ensure that everyone takes note that no level of lead is considered safe.

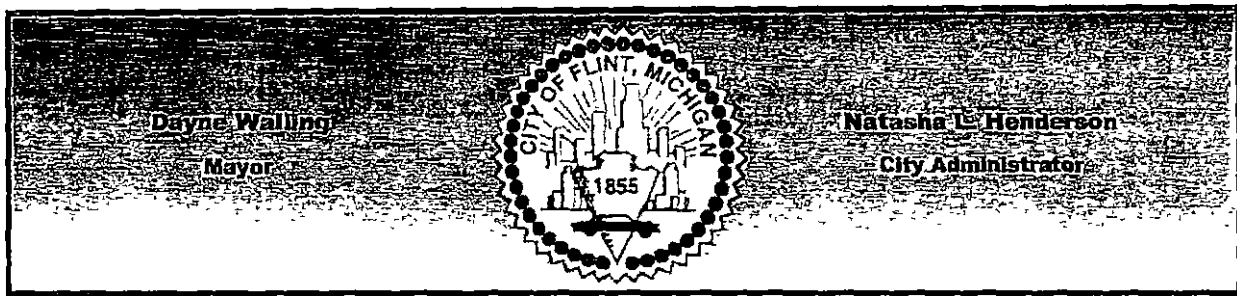
The Genesee County Health Department has issued a fact sheet regarding lead precautions for residents. The fact sheet can be found on their website at www.gchd.us. Here are a few of the suggestions the Health Department recommends:

- Flush your cold-water pipes by running the water for approximately 5 minutes
- Use only water from the cold-water tap for drinking, cooking, and especially for making baby formula.
- Install a water filter that is NSF-certified for lead removal.

Lead contamination can leach into water from a home's lead water service lines, lead solder, and leaded plumbing materials including fixtures, faucets, and fittings. Older service lines with pipes and fixtures installed before 1986 can sometimes be more susceptible to lead issues due to materials used in the home such as lead based paint and lead pipes.

This message is meant as a precaution to residents and does not mean that all homes in the City will experience the same issue. Residents with concerns about lead service lines

City Hall
1101 S. Saginaw Street - Flint, Michigan 48502
810-766-7346 FAX: 810-766-7218 www.cityofflint.com



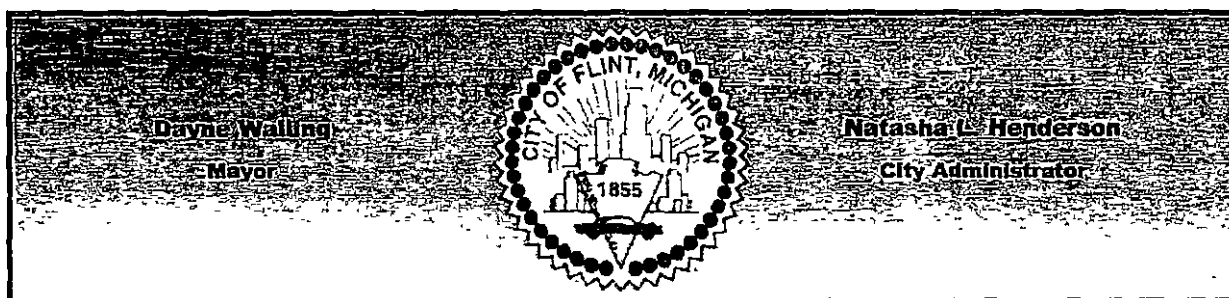
and lead in home plumbing fixtures are encouraged to contact the City's Utilities Division to schedule a free water testing by calling the Water Treatment Plant at 810-787-6537 and pressing #1 after prompted or by emailing flintwater@cityofflint.com.

The City of Flint is working proactively along with the County Health Department, the Michigan Department of Environmental Quality, and the U.S. Environmental Protection Agency to improve the water system throughout the City. An accelerated plan to add a corrosion control agent to our water within 30 to 60 days with expedited approval from the Michigan Department of Environmental Quality is already underway. This will reduce corrosion which can cause lead in old pipes to leach into the water.

This plan is in addition to Mayor Walling's letter requesting \$30 Million in water infrastructure assistance funding from the State of Michigan. \$10 Million of that request would be for the replacement of lead service lines in households to ensure that lead no longer presents a danger to the drinking water of our residents. As the letter states, "It is the City's position that the abatement of lead through the removal of lead containing pipes and fixtures in homes is the best long term solution to keeping our residents' water safe."

Mayor Walling further stated: "I am extremely concerned about the risks around lead with Flint's children and I will be working tirelessly to ensure the water is safe and all of our families have the information they need. I also will continue to pursue funding for infrastructure improvements and a comprehensive healthy homes initiative that addresses lead in paint and pipes. We have to get the lead out of our community to eliminate the threat of childhood lead poisoning."

The City of Flint continues working proactively with the County Health Department, the Michigan Department of Environmental Quality, and the U.S. Environmental Protection Agency to improve the water system throughout the City. The City remains committed to working with all of our partners in the Water Technical Advisory Committee to address all



issues of public health and quality concerns that face the community. Updates on progress made in addressing this issue will be made during regular public meetings including City Council and other scheduled meetings. Information on this and all related matters will continue to be posted on the City of Flint's website, cityofflint.com.

-END-



Genesee County Health Department

Mark Valacak, M.P.H., Health Officer
Gary K. Johnson, M.D., M.P.H., Medical Director

How does lead get into my tap water?

Under typical circumstances, lead will dissolve into the water. The concentration of lead in drinking water can vary greatly, depending on the corrosiveness of the water, the type and age of the plumbing materials and the length of time that the water stands in the pipes. The highest levels of lead occur when very corrosive water stands motionless in lead or lead soldered pipe for long periods of time.

How do I know if my tap water is contaminated with lead?

The only way to know whether your tap water contains lead is to have it tested. You cannot see, taste, or smell lead in drinking water. There are different sampling methods for sampling lead in drinking water. To determine your household risk, it is recommended to take a first draw sample.

Does lead in my tap water cause health effects?

Lead can cause damage to the brain, red blood cells and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. Lead in water can be a special problem for infants, whose diets may be mostly liquids, such as baby formulas or concentrated juices mixed with water. Smaller bodies can absorb lead more rapidly than bigger ones. A child's mental and physical growth can be permanently harmed by too much lead. Risk will vary, depending on the individual, the circumstances, and the amount of water consumed.

What can I do to reduce or eliminate lead in my tap water?

Flush your cold-water pipes by running the water for approximately 5 minutes. The longer the water has been sitting in the pipes, the more lead it may contain. You can fill containers for later use, after the flushing process. Use only water from the cold-water tap for drinking, cooking, and especially for making baby formula. Hot water is likely to contain higher levels because it dissolves more lead. You may choose to install a water filter that is NSF-certified for lead removal. If a water filter is installed, replace filters at least as often as recommended by the manufacturer.

Buy a lead-free faucet. The legal definition of "lead-free" still allows brass faucets to contain up to 8 percent lead. However, faucets marked with "NSF 61/9" and/or "California Proposition 65" meet stricter limits. Regularly clean particles from faucet aerators.

Is it safe to take a bath or shower, if my water has high lead levels?

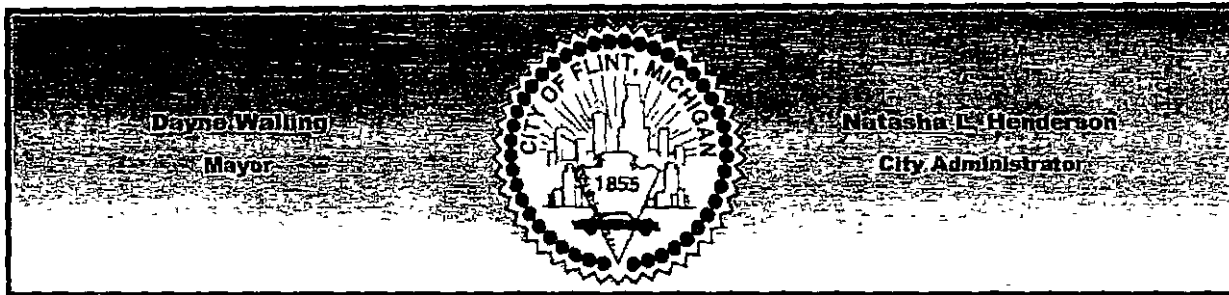
Yes. Bathing and showering should be safe for you and your children, even if the water contains lead over EPA's action level. Human skin does not absorb lead in water. This information applies to most situations and to a large majority of the population, but individual circumstances may vary. Some situations, such as cases involving highly corrosive water, may require additional recommendations or more stringent actions.

Who do I contact for more information?

The local water authority is always your first source for testing and identifying lead contamination in your tap water. You can visit the City of Flint Website at www.cityofflint.com or contact the Flint Water Department at 810-787-6537.

WWW.EPA.GOV

WWW.MDEQ.GOV



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For Immediate Release

City of Flint Reconnects to Detroit Water

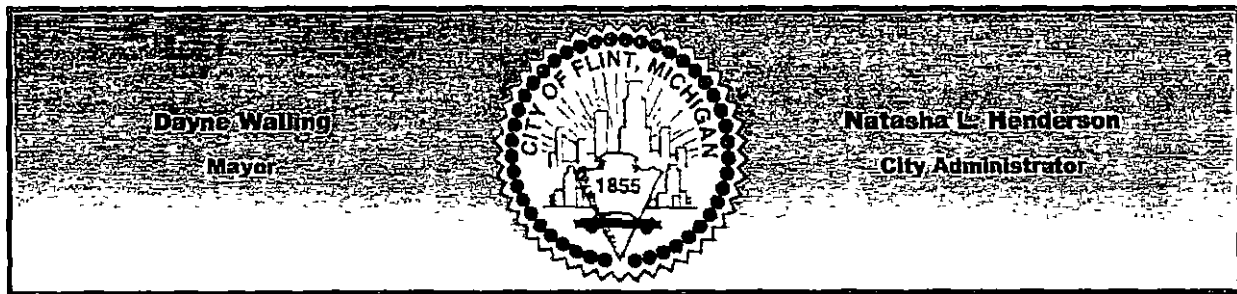
Flint, Michigan – October 16, 2015 – Flint has reconnected to Detroit water. reached an agreement with the Detroit Water and Sewerage Department (DWSD) for the temporary provision of treated Lake Huron water to Flint. Work to establish the reconnection will begin immediately in a coordinated effort between the City of Flint, Genesee County and the DWSD.

A tremendous effort by all three partners, along with the efforts of the Governor and the State Legislature, ensured that this action occurred as quickly as possible. "The money from the state to begin fixing Flint water by reconnecting to Detroit is just a start – a down payment," said Mayor Dayne Walling. "I am not going to stop until every drop of drinking water in Flint is 100% safe."

Detroit water will be introduced into the Flint system throughout the evening. It is expected that the thorough replacement from Flint River water to Detroit water will happen after approximately three weeks. Residents in Flint may see discoloration as well as noticing some taste and odor issues during the transition

Water provided by DWSD will contain corrosion control agents to hinder the leaching of lead from old pipes into the water; however, the City will also be adding additional corrosion control agents to further minimize the risk presented by lead pipes.

–CONTINUE–



The contract between the City and DWSD calls for the provision of 12.5 million gallons per day (mgd) of treated water from Lake Huron at a cost of \$1.1 million per month. DWSD Director Sue McCormick noted that the talks between Flint, DWSD and the GLWA Board were very cordial: "everyone acted in a spirit of cooperation in order to come to this agreement." Flint will purchase water from Detroit until the Karegnondi Water Authority (KWA) pipeline can be completed in 2016. At that time, the KWA will become the primary water source for the City and the Flint River will remain as a backup system.

Residents with questions or concerns about the hydrant flushing in their area can call the Water Service Center at 810-766-7202. Continuing information on water will be provided via the City of Flint's website, cityofflint.com.

—END—



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGIONAL ADMINISTRATOR
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF.

MEMORANDUM

DATE: November 4, 2015

SUBJECT: Transmittal of Final Report - High Lead at Three Residences in Flint, Michigan

FROM: Tinka G. Hyde *Tinka G. Hyde*
Water Division Director

TO: Jim Sygo
Deputy Director
Michigan Department of Environmental Quality

Howard Croft
Director of Flint Public Works

Enclosed please find for your file a final redacted version of a report prepared by EPA Scientist, Miguel Del Toral, regarding lead in drinking water at three residences in Flint, Michigan. The redactions remove personally identifiable and medical information. This report has been finalized and is also being provided to the National Drinking Water Advisory Council (NDWAC) for discussion during their upcoming meeting on November 17-19, 2015. We understand you saw an earlier version of this document; and note that most of the recommendations in that interim report are already being implemented (e.g., the City of Flint has switched back to Detroit water; filters have been provided to residents; and additional corrosion control treatment will be implemented).

The final report contains important new information indicating that physical disturbances of lead service lines can dislodge the protective coating that prevents lead from leaching into drinking water. The final report recommends notifying residents about the potential risks of increased lead levels in drinking water when work is undertaken that may disturb lead service lines.

cc: Natasha L. Henderson, City of Flint Administrator

High Lead Levels in Flint, Michigan

The purpose of this report is to present the findings of activities conducted in response to high lead levels in drinking water reported to the United States Environmental Protection Agency Region 5 Office (EPA) by a resident in the City of Flint, Michigan.

Background Information

Prior to April 30, 2014, the City of Flint purchased water from the City of Detroit. On April 30, 2014, the City of Flint switched from utilizing purchased water from Detroit to a new water source, the Flint River. Subsequent to the change in source water, the City of Flint experienced a number of water quality issues resulting in violations of National Primary Drinking Water Regulations (NPDWR) including acute and non-acute Coliform Maximum Contaminant Level (MCL) violations and Total Trihalomethanes (TTHM) MCL violations (see Appendix A).

Beginning in January 2015, [REDACTED], a resident of Flint, called the Flint Water Department (FWD) regarding the water quality in her home. In response to the initial and subsequent calls, the FWD visited the [REDACTED] home on a number of occasions and also collected tap water samples. [REDACTED] also contacted EPA regarding these same water quality issues and medical issues she believes are associated with the water quality in Flint.

Following initial calls on the general water quality, on February 26, 2015, [REDACTED] contacted EPA regarding high lead levels found in her drinking water by the City of Flint. The result of the initial lead in water sample collected by the City of Flint on February 18, 2015 from the [REDACTED] home was 104 µg/L and the level of iron in the water exceeded the capability of the instrument to measure (>3.3 mg/L). On February 26, 2015, upon receiving the lead results from [REDACTED], the EPA contacted the Michigan Department of Environmental Quality (MDEQ) regarding the high lead result. The MDEQ advised that the City of Flint collect a follow-up sample for lead at the [REDACTED] home.

On March 3, 2015, the City of Flint collected a follow-up sample for lead at the [REDACTED] residence and the result of this second sample was 397 µg/L¹. Subsequent to receiving her second result, EPA spoke to [REDACTED] via phone on March 19, 2015, and the following information was provided by [REDACTED]:

- The [REDACTED] home is a HUD home which was gutted and renovated in 2011. All existing plumbing had been removed and the [REDACTED] installed plastic plumbing.
- Due to high iron levels in the tap water, the [REDACTED] installed an iron filter downstream of the service line inlet into the home.
- [REDACTED] indicated that at this time they are not drinking the water or using it for cooking. She stated that her child's blood lead level (BLL) was originally at [REDACTED] in 2012 and that a more recent test showed it had increased to [REDACTED], but she noted that

¹ Note: A third water sample had been collected on April 2, 2015, but the results had not been provided to the [REDACTED] at the time the interim report was written. The third lead in water sample result was 707 µg/L.

the BLL testing was done well after the child had stopped drinking the water and may have been higher during the time the child was consuming the water.

- Water samples collected by the City of Flint from her home were collected from the kitchen tap after the iron filter was physically removed.
- The Flint Water Department (FWD) informed [REDACTED] that her service line does not connect to the water main in front of her home as is typically the case for most homes.
- On March 18, 2015, City of Flint personnel went to the [REDACTED] home to locate the external shut-off valve in conjunction with the planned replacement of the [REDACTED] service line and were unsuccessful. Eventually it was discovered that the external shut-off valve was located at the corner of [REDACTED] and Bryant Street, two houses down from the [REDACTED] home.

As part of EPA's effort to respond to [REDACTED] concerns regarding her water results, EPA contacted the FWD. The following information was provided to EPA by the FWD:

- [REDACTED] home is one of the first homes built on the block and the service line runs for approximately 50-60 yards, connecting to the water main on Bryant Street which runs perpendicular to [REDACTED] (see Appendix A).
- Flint has a large number of lead service lines, so it would not be surprising to find that this is a very long lead line.
- The first sample from the [REDACTED] home was collected with the iron filter in place, and the second was with the iron filter physically removed. The iron filter was located just after the water meter.
- [REDACTED] showed FWD a video of her son 10 minutes after taking a bath, and that he had a full body rash in the video.

It was a common practice in the early 1900s to purchase large parcels of land and later subdivide them. Since service lines are typically run from the water main to the nearest location on a property and it is possible that the [REDACTED] home may have originally been part of a larger parcel of land that encompassed the two homes that now exist adjacent to the [REDACTED] home and was subsequently divided, leaving the original home connected to the same service connection and water main, while the newer homes were connected to a more recent water main installed along [REDACTED].

Based on a suspected conflict of interest at the healthcare facility that originally tested her son's BLL, [REDACTED] took her son to a different healthcare facility to have his blood lead tested again. On April 1, 2015, [REDACTED] provided EPA with a copy of her child's blood lead testing performed on March 27, 2015, showing a higher BLL ([REDACTED]) than the original test.

Due to the persistently high lead results, the FWD shut off the water service to the [REDACTED] home on April 3, 2015. Per agreement between the FWD and [REDACTED], her home was then connected to her neighbor's home via a garden hose, from one hose bib to another. This was understood to be a temporary measure until the [REDACTED] service line could be replaced. The [REDACTED] used this water connection only for bathing, washing dishes and washing clothes.

At the invitation of [REDACTED], EPA visited the [REDACTED] home on April 27, 2015, and reviewed the internal plumbing and information provided by [REDACTED], including water samples and spent filter cartridges. During this visit, EPA observed that the internal pipes, valves and connectors at the [REDACTED] residence were made of CPVC plastic, approved by NSF for potable drinking water applications, with a few minor metal connectors. A review of the treatment units in the home by EPA found that there was no iron filter in the home as had previously been thought. The only active treatment device in the home was a whole-home sediment filter which utilizes NSF certified Whirlpool WHKF-WHWC cartridge filters for sediment removal and taste/odor. There was also a non-functioning 'Water Resources International Hydro-Quad Commercial Water Processor' which was bypassed (see Appendix A).

At the request of [REDACTED], Dr. Marc Edwards at Virginia Tech provided sampling instructions to [REDACTED] for collecting a series of samples from her home. As part of the instructions, on the night of April 27, 2015, the water at the [REDACTED] residence was turned back on temporarily and the kitchen tap was flushed for 25 minutes at low flow prior to letting the water sit overnight. A series of sequential samples were collected the following morning (April 28, 2015) and sent to Dr. Edwards for analysis.

Dr. Edwards provided [REDACTED] with the results of the analyses and also shared the results with EPA on May 5, 2015, along with information regarding other chemical parameters tested (see Appendix B). In addition to very high lead levels in all sample results, the analytical data shows a correlation between lead and phosphate as well as lead and aluminum in all samples. On April 24, 2015, EPA had learned that Flint did not have corrosion control treatment in place and also learned that Flint was using ferric chloride as a coagulant. Consequently, as the City of Flint is not utilizing phosphate or alum as treatment chemicals since the source switch, the results indicate that it is likely that the phosphate and aluminum were being released from the scale within the distribution system network. This scale would have formed on the inside of the pipes in Flint during the time when the City was purchasing water from Detroit, as Detroit utilizes orthophosphate for corrosion control and alum as a coagulant in their water filtration process.

Research conducted by EPA on lead content in pipe scales has shown that scales which form on the inside of lead pipes can be released or dislodged into the water and may contain a high percentage of lead (Appendix C). Although the results received from Virginia Tech were indicative of the presence of a lead service line, the FWD indicated that no records existed to confirm whether any portion of the service line connecting to the [REDACTED] home was made of lead. However, given the high lead levels found, it was presumed that at least a portion of the service line was likely made of lead. In the course of following up on the high lead at the [REDACTED] home, additional sample results provided to EPA from other residences in Flint also showed high lead levels.

Primarily from a public health standpoint, but also from a research standpoint, it was important to try to find out what the cause of these very high lead levels might be. EPA Region 5, EPA's Office of Research and Development and others have been working

together collaboratively to better understand lead release mechanisms from lead service lines in anticipation of upcoming revisions to the Lead and Copper Rule (LCR) and as part of a collaborative effort in EPA Region 5 to study potential options for optimizing phosphate treatment to control lead in water and the need to reduce phosphorus discharges into the environment. Since the [REDACTED] service line was scheduled for replacement on May 6, 2015 and the presumption was that at least a portion of the service line was lead, EPA visited the [REDACTED] home on the day of the service line replacement to gather information and service line pipe samples that could provide additional information as to how lead levels could get as high as they did in this case.

The original service line to the [REDACTED] home was disconnected and two service line pipe segments from this service line were extracted on May 6, 2015. Additional tap water samples were collected also from two homes on Bryant Street that were connected to the same water main as the [REDACTED] home (Appendix A). The samples were collected from these homes as they had more typical service line lengths as compared with the [REDACTED] home. During the same visit, patches of asphalt were also noted along the curb on Browning Avenue, indicating that excavation had occurred. These patches, which were in proximity of the [REDACTED] service line in the parkway (see Appendix C) may be one of the potential factors contributing to the high lead at the [REDACTED] home, as it has been shown that physical disturbances to pipes can dislodge the scales within those pipes.

The two service line segments that were extracted were subsequently identified as galvanized iron pipe. Analyses conducted by Virginia Tech on the extracted portions of the pipe indicate that the galvanized iron pipe was fairly typical in terms of composition (see Appendix C). The galvanized iron portion ran from inside the [REDACTED] home to the external shut-off valve at the corner of [REDACTED] and Bryant Street. The remainder of the [REDACTED] original service line from the shut-off valve to the water was made of lead.

Although the service line had been disconnected from the [REDACTED] home, it was not possible to retrieve a segment of the lead portion of the service line as it was beyond the shut-off valve which had been closed and left in place. Following the disconnection of the original service line, a new service line made of copper was installed from the [REDACTED] home to the water main in front of the home on [REDACTED]. Subsequent to the replacement of the service line at the [REDACTED] home, water samples were also collected from the [REDACTED] home and sent to the EPA Chicago Regional Laboratory for analysis. In all three homes, the sequential samples were collected using standard protocols used in prior sequential sampling efforts to capture water samples reflecting lead levels from the kitchen tap to the water main. Two additional samples were collected from the water heater drain valve at the [REDACTED] home to determine if lead deposits had accumulated in the water heater, and a final sample was collected from the bathroom tap. The sequential sampling results indicate that the service line replacement eliminated the high lead levels and that no residual lead had accumulated within the plastic plumbing of the [REDACTED] residence, which was a potential concern and possibility based on prior research. One of the two samples collected from the [REDACTED] hot water heater had high lead (32 µg/L), likely from lead particulate that had accumulated in the tank, and the sample collected from the bathroom was 5.5 µg/L.

The sequential samples collected from the two homes on Bryant Street had differing results. At the first home (Site 2), a series of 15 sequential one-liter samples were collected and the results are indicative of a service line that does not contain any portion that is made of lead. Consequently the lead results were low overall for samples representative of the service line. The first sample in the sequential sampling series was the highest, which potentially indicates the presence of leaded brass in the faucet or underlying sink fixtures. Some leaded brasses manufactured prior to the 2011 lead-free law have been shown to release high levels of lead in certain water qualities. Leaded-solder was ruled out as the home plumbing consisted of galvanized iron pipe, and it is presumed that if the galvanized iron pipe were contributing the higher lead, the lead levels would be more consistent in all 15 samples.

At the second home (Site 3), a series of 15 sequential one-liter samples were collected from the kitchen tap and the results indicated that there were no significant sources of lead within the home plumbing but that a portion of the service line is likely made of lead, as indicated by the characteristic peaking of lead levels in the liters capturing water from the service line between the property and the water main, where the portions of many service lines in Flint are made of lead.

All three sets of sequential samples were analyzed for lead, copper, iron, phosphorus and cadmium. In contrast to the samples analyzed by Virginia Tech from the [REDACTED] home prior to the removal of the original service line, no phosphorus was present in the sequential samples at the [REDACTED] home following the replacement of the service line. In addition, no phosphorus was detected in the sequential samples from the two homes on Bryant Street. These results indicate that the source of high lead, aluminum and phosphorus in the analyses conducted by Virginia Tech was likely dislodged or disintegrated scale from within the [REDACTED] original service line.

The sequential sampling results from the [REDACTED] home before and after service line replacement, as well as the results from the two homes on Bryant Street are included in Appendix B.

Although relative contributions cannot be determined, there are a number of factors that could have contributed to the high lead levels found at the [REDACTED] home as follows:

1) Corrosiveness of water and lack of mitigating (corrosion control) treatment

The corrosiveness of the water and the absence of mitigative treatment to control lead release are well known factors that can contribute to high lead release.

2) Presence of a lead service line

Lead service lines are the largest source of lead, when present, and can contribute up to 75 percent of the total mass of lead released into the water. The portion of the original service line from the water main to the external shut-off valve at the corner of [REDACTED] and Bryant Street, estimated to be approximately 25 feet in length, was found to be a lead

pipe. In addition, studies have also shown that the scales within galvanized iron pipe downstream of lead pipe segments can be 'seeded' with lead from the lead portion of the service line. The [REDACTED] service line was much longer than most typical service lines which would allow accumulation of a greater total mass of scale within the pipe.

3) Physical disturbances

A recent EPA study indicates that physical disturbances in proximity to lead service lines can cause the dislodging of the protective scales from within the service lines. The photograph in Appendix C shows the scale that was dislodged from inside a lead service line during routine maintenance work in another city due to a physical disturbance of the line. The dislodged scale and sediment contained a very high concentration of lead. At the time of the EPA visit to the [REDACTED] home, there were two patches of new asphalt visible on [REDACTED] along the parkway where the [REDACTED] original service line was located, indicating recent excavation and possible recent physical disturbances to the [REDACTED] service line (Appendix C). These potential disturbances were along the galvanized iron section of the service line and as noted above, research has shown that the presence of lead pipe upstream can 'seed' the galvanized iron pipe downstream with lead, which results in an accumulation of lead-bearing scales within the galvanized pipe downstream of the lead portion of the service line. It is reasonable to assume that these physical disturbances to the galvanized iron portion of the service line could therefore result in the same dislodging of scale and sediment as studies have shown can happen with lead service lines.

The street disturbances on [REDACTED] occurred after the [REDACTED] moved into the home along the portion of the service line made of galvanized iron pipe. There were no visible signs of disturbance on Bryant Street where the lead portion of the [REDACTED] service line was situated (see Appendix C). It is likely, given the extremely high lead levels found and the co-occurrence of aluminum, phosphorus and lead, that the long segment of galvanized iron pipe was seeded with lead over the entire length of the pipe and the physical disturbances and other factors such as the water chemistry resulted in the release of large amounts of the high-lead bearing scale and sediment into the water. Virginia Tech also found nearly perfect correlations between the lead in water and markers for galvanized pipe scales including zinc.

Recommendations

As indicated by the results from the [REDACTED] home and previous EPA work, the presence of lead pipes over many years has likely resulted in the accumulation of lead in the scales within non-lead pipes downstream of the lead pipe and physical disturbances to the leaded or non-leaded portions of the service lines have the potential to release large amounts of scale and sediment that could pose an immediate and acute health hazard to the residents. Consequently, even with corrosion control treatment in place in the future, physical disturbances will be capable of dislodging the high lead-bearing scale and sediment from non-lead pipes as well as lead pipes, as was the case in the earlier EPA study.

Obtaining information on the lead reservoirs in the scales within the lead and non-leaded portions of intact service lines is essential for determining the potential risk to residents

from lead-bearing scale released as lead lines are replaced as well as the risk that may remain following removal of the lead lines, where the non-lead portions of service lines are left in place.

As the [REDACTED] service line was very long compared to the length of most typical service lines, it is important to assess the potential risk posed by the scale reservoirs in more typical lengths of service lines by extracting both the leaded and non-leaded portions of service lines which have not been physically disturbed. The service lines chosen for extraction and analysis should be representative of the materials commonly used downstream of the lead pipe (e.g., galvanized iron, copper, plastic). Extraction/handling procedures should be developed by EPA to ensure that damage to the scales from the excavation, extraction and delivery of the service line segments is minimized. Sequential sampling should also be conducted on a representative group of homes with common plumbing materials (e.g., galvanized iron, copper, plastic) to determine the extent to which the lead from the service line has seeded the interior plumbing in homes.

It is also critically important to develop and incorporate ongoing training and public education on the potential for high lead release from the scales as a result of any future physical disturbances to service lines and mitigative actions that residents can take to lower their exposure risk. The training and educational material should be assessed for clarity, meaningfulness, and accessibility by a group of residents and health experts to ensure the effectiveness of the communications.

At a minimum, immediate training and public education on the potential risks posed by physical disturbances to service lines should be developed by communications experts and provided to residents, community groups, elected officials, health departments, pediatricians and gynecologists, water and non-water utilities (gas, electric, cable, etc.), plumbing organizations and contractors. Residents should be notified of scheduled work by water and non-water utilities and informed of the potential risk of increased lead levels due to these disturbances.

Appendix A – Background Information

National Primary Drinking Water Regulations (NPDWR) Violations – City of Flint

Following the switch to the Flint River, the City of Flint experienced a series of NPDWR violations as follows:

- Acute Coliform MCL violation in August 2014
- Monthly Coliform MCL violation in August 2014
- Monthly Coliform MCL violation in September 2014
- Average TTHM MCL violation in December 2014
- Average TTHM MCL violation in March 2015
- Average TTHM MCL violation in June 2015

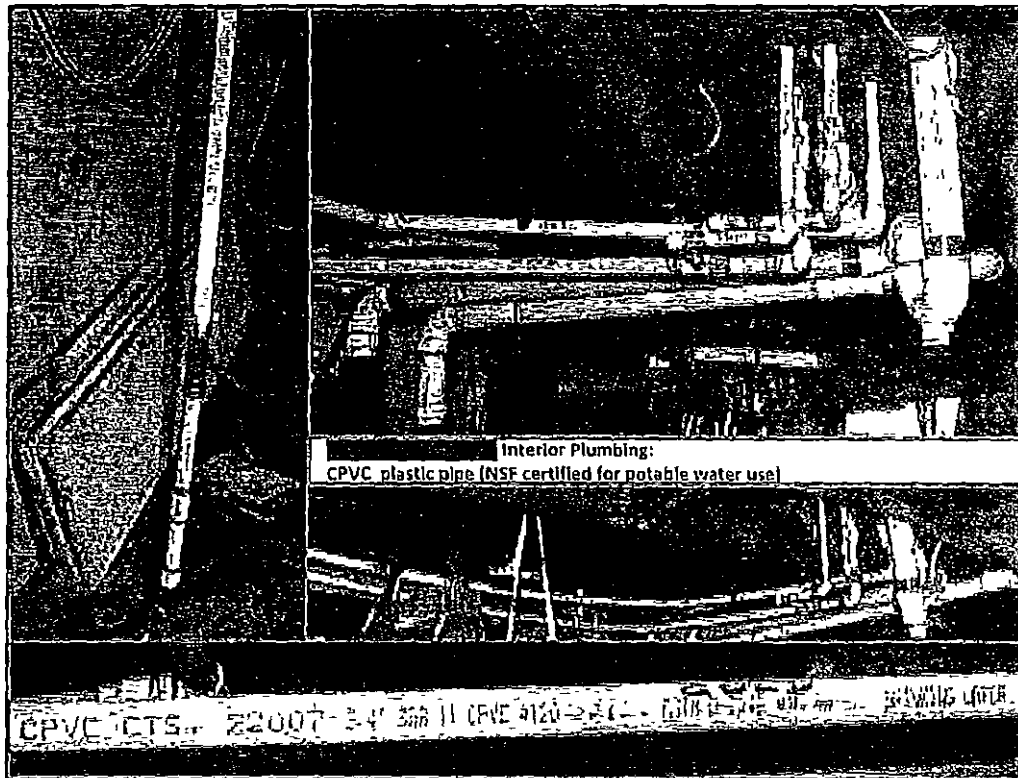
Sampling Sites

The map below shows the three homes that were sampled as provides information on the length of the service lines and the plumbing material. Two portions of the original service line were extracted and analyzed and a third portion was collected from the entry point into the home, but not analyzed.

[map redacted because it shows Personally Identifiable Information]

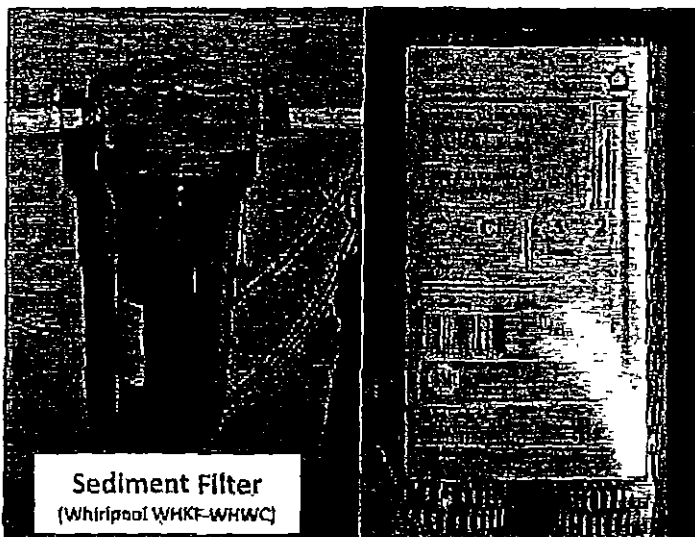
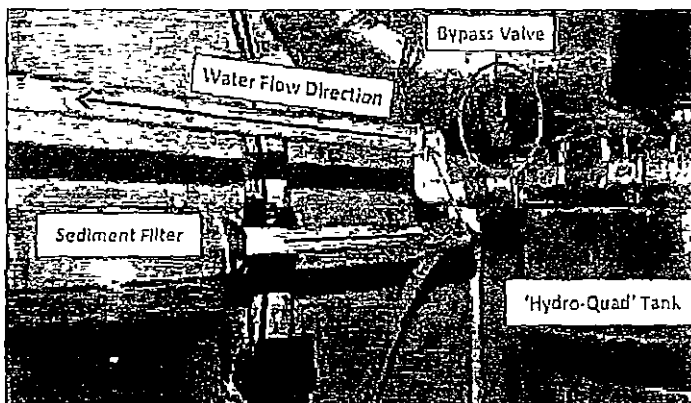
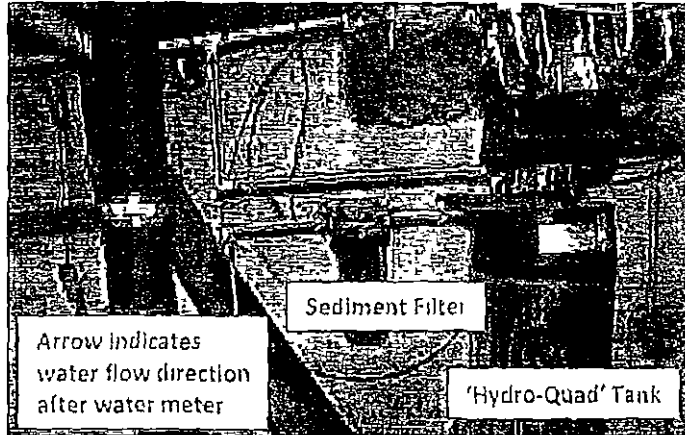
Internal Plumbing – [REDACTED]

The following pictures were taken at the [REDACTED] home located at [REDACTED]. With the exception of a few minor metallic connectors, all potable water plumbing in the home was found to be CPVC plastic pipe which is NSF-certified for drinking water use.



Treatment Units – [REDACTED]

The [REDACTED] home has a whole-home sediment filter, as well a non-functioning 'Hydro-Quad Commercial Water Processor' which is bypassed. There was no iron filter in the home as had been previously reported.



Appendix B – Analytical Results

Lead in water sampling results from the [REDACTED] residence ([REDACTED])

City of Flint Samples

The City of Flint collected water samples from the [REDACTED] residence and analyzed them for lead. The results for each date are listed below.

February 18, 2015: 104 µg/L

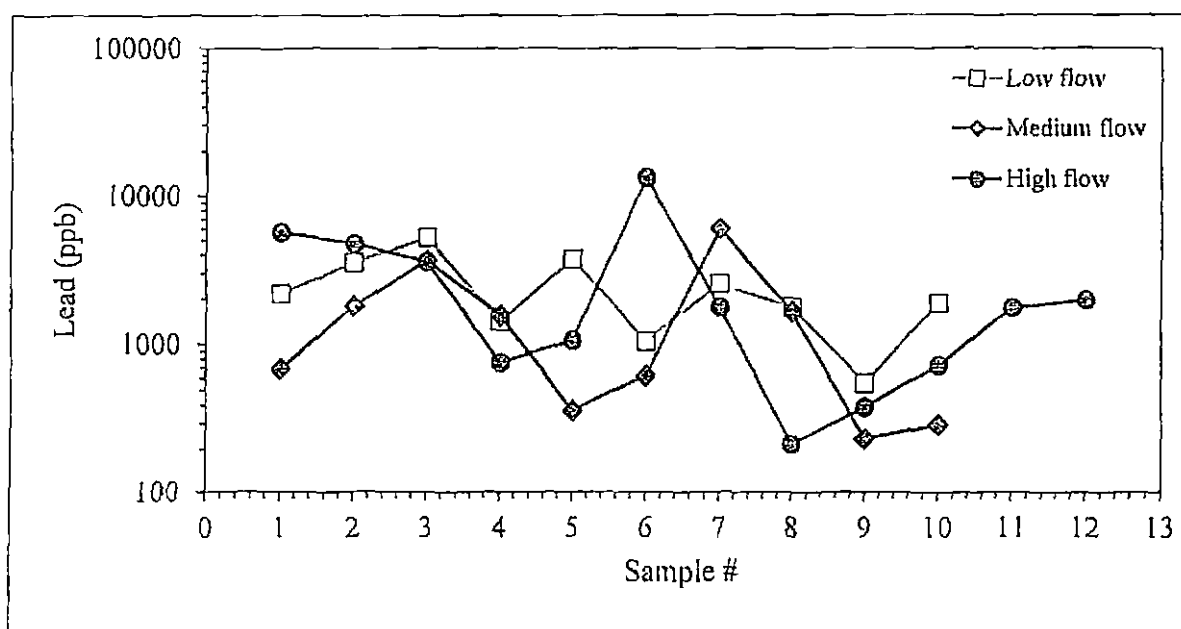
March 3, 2015: 397 µg/L

April 2, 2015: 707 µg/L*

*This sample result had not been provided to the [REDACTED] at the time the interim report was written.

Virginia Tech Sampling Results (provided courtesy of Virginia Tech)

Samples were collected from the [REDACTED] home following an extended stagnation period (April 3, 2015 to April 27, 2014) after the water at the [REDACTED] residence had been shut off. The water was turned back on and three sets of sequential samples were collected on April 28, 2015, at different flow rates (low, medium and high).



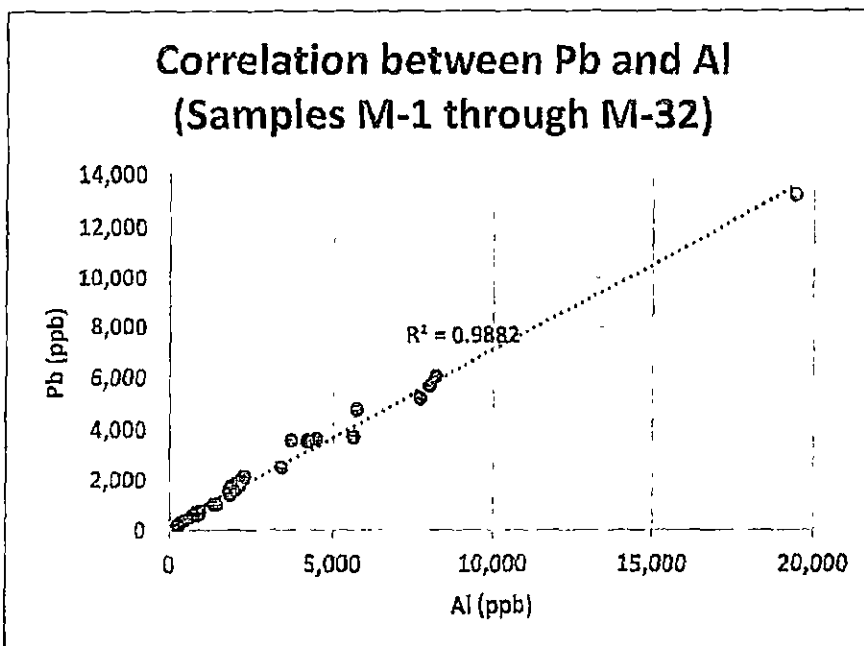
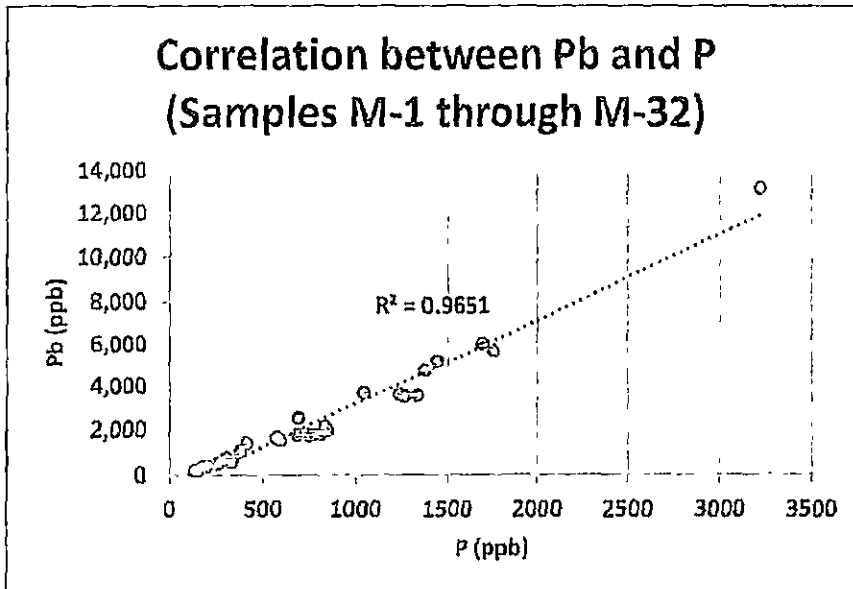
Element (units)	Low Flow									
	1 L Sample Bottle							125 mL Sample Bottle		
	M-1	M-2	M-3	M-4	M-5	M-6	M-7	M-21	M-22	M-23
Ag (ppb)	0	0	0	0	0	0	0	0	0	0
Al (ppb)	2,285	4,199	7,683	1,856	5,623	1,422	3,413	1,865	666	2,015
As (ppb)	3.3	3.9	4	2	3.2	2	2.6	3.6	1.9	3.1
Ba (ppb)	31.3	39.8	27.7	21.2	24.2	20.9	22.8	31.3	21.3	32.6
Ca (ppb)	43,150	43,620	43,580	42,590	43,030	42,030	42,440	40,790	41,050	41,460
Cd (ppb)	2.5	4.2	5.7	1.9	3.9	2	2.5	2.2	1.4	2.4
Cl (ppm)	1,206	1,148	1,272	1,178	1,187	1,214	1,218	1,641	1,076	1,044
Co (ppb)	1.1	1.7	0.9	0.4	0.7	0.4	0.5	0.9	0.3	1
Cr (ppb)	2.1	2.5	2.6	1.3	1.9	1.6	1.5	1.8	1.3	1.7
Cu (ppb)	235	355	294	94	146	101	112	180	82	178
Fe (ppb)	3,598	4,928	3,419	1,446	3,029	2,142	1,780	3,096	1,344	3,241
K (ppb)	3,480	3,508	3,445	3,435	3,430	3,391	3,409	3,256	3,319	3,341
Mg (ppb)	10,310	11,910	17,990	11,290	15,470	10,610	12,720	8,861	9,396	9,098
Mn (ppb)	1,734	2,790	1,093	462	703	429	652	1,382	442	1,509
Mo (ppb)	2.3	2.3	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.8
Na (ppb)	17,790	17,860	17,810	17,620	17,650	17,410	17,610	16,960	17,100	17,280
Ni (ppb)	9.8	16	30.7	8.1	23.2	6.2	15.3	6.6	3.7	6.8
P (ppb)	835	1,267	1,441	416	1,040	379	691	773	261	819
Pb (ppb)	2,171	3,550	5,224	1,412	3,735	1,038	2,542	1,759	552	1,857
S (ppm)	28.5	28.7	28.5	28.4	28.5	28	28	26	27	27.1
Se (ppb)	0.2	0	-0.1	0.1	0.2	0	0.3	0	0	0.2
Si (ppb)	3,212	5,281	12,320	4,474	9,401	3,770	6,231	2,619	2,582	2,775
Sn (ppb)	4.6	4.9	6.1	2.2	4.5	2.3	3	2.3	1.5	2.3
Sr (ppb)	129.4	132.3	128.5	125	127.7	125.3	126.1	126.3	125.5	128
Ti (ppb)	3.4	5.8	8.3	2.1	5.8	1.9	3.1	3	1.4	3.1
U (ppb)	1	1.6	2.6	0.8	1.9	0.7	1.2	0.9	0.4	0.9
V (ppb)	13.9	17.5	23.9	9.8	17.6	8.9	13.8	12.2	6	10.8
Zn (ppb)	1,055	1,848	2,731	777	1,890	839	979	746	513	808

Element (units)	Medium Flow									
	1 L Sample Bottle							125 mL Sample Bottle		
	M-8	M-9	M-10	M-11	M-12	M-13	M-14	M-24	M-25	M-26
Ag (ppb)	0	0	0	0	0	0	0	0	0	0
Al (ppb)	891	2,142	4,493	1,810	431	877	8,159	2,005	286	347
As (ppb)	2.2	2.9	3.9	2.5	2	2.3	4.6	2.7	1.8	2
Ba (ppb)	22	29.1	36.3	28	18.9	22.6	37.1	26.2	18.9	19.4
Ca (ppb)	41,520	41,580	42,080	41,490	41,020	40,850	42,010	40,940	41,110	40,550
Cd (ppb)	1.5	2.4	4	2.1	1	1.5	4.9	2.9	0.9	1
Cl (ppm)	1,329	1,211	1,252	1,225	1,507	1,321	1,324	1,179	1,258	1,318
Co (ppb)	0.4	0.8	1.3	0.7	0.2	0.4	1.4	0.7	0.2	0.2
Cr (ppb)	1.1	1.5	2.2	1.4	1.2	1.1	3.5	2.1	1.1	1.1
Cu (ppb)	104	151	257	144	65	119	267	166	52	59
Fe (ppb)	1,510	2,476	4,254	2,258	912	1,471	4,563	3,450	711	820
K (ppb)	3,363	3,391	3,370	3,352	3,344	3,311	3,360	3,308	3,356	3,311
Mg (ppb)	9,769	9,960	12,360	9,703	9,331	9,513	16,430	10,820	9,237	9,166
Mn (ppb)	498	1,185	1,878	1,052	231	536	1,947	967	167	220
Mo (ppb)	1.8	1.8	1.8	1.9	1.8	1.8	2.2	2	1.7	1.7
Na (ppb)	17,240	17,370	17,370	17,310	17,190	17,010	17,320	17,020	17,140	16,950
Ni (ppb)	4.1	7.7	16.2	6.8	2.7	3.8	33	7.7	2.1	2.4
P (ppb)	321	690	1,233	595	178	332	1,697	573	144	163
Pb (ppb)	688	1,791	3,655	1,549	366	616	6,048	1,631	237	292
S (ppm)	27.6	27.5	27.3	27.3	27.1	26.9	27	26.4	27	26.6
Se (ppb)	0	0	0.2	0.1	0.1	0.2	0.2	0.3	0.1	0
Si (ppb)	2,892	3,591	6,180	3,307	2,445	2,756	11,280	4,184	2,274	2,303
Sn (ppb)	2.2	2.6	4.4	2.5	1.4	1.8	4.9	3	1	1.1
Sr (ppb)	124	128	128	126	124	124	128	126	125	124
Tl (ppb)	1.6	2.9	5.5	2.5	1	1.2	7.7	2.7	0.4	0.6
U (ppb)	0.5	0.9	1.7	0.9	0.4	0.5	2.7	0.9	0.3	0.3
V (ppb)	8.4	11.9	17.5	10.4	8.2	8.4	25.1	9.7	6	7.4
Zn (ppb)	657	933	1,669	836	366	592	1,934	1,304	305	337

Element (units)	High Flow											
	1 L Sample Bottle						125 mL Sample Bottle					
	M-15	M-16	M-17	M-18	M-19	M-20	M-27	M-28	M-29	M-30	M-31	M-32
Ag (ppb)	0	0	0	0	0	0	0	0	0	0	0	0
Al (ppb)	7,984	5,713	3,714	912	1,354	19,440	1,893	248	455	822	1,859	2,176
As (ppb)	5	4.1	4.3	1.9	2.1	7.4	2.9	2	2.2	2.3	3.2	3.4
Ba (ppb)	40	37	45	21	22	41	32	19	20	22	31	34
Ca (ppb)	42,200	41,870	41,760	41,120	41,110	43,860	41,410	40,730	40,990	40,550	41,000	41,050
Cd (ppb)	5.6	4.1	3.7	1.4	1.9	9.3	2.2	0.9	1.2	1.6	2.1	2.5
Cl (ppm)	1,347	1,261	1,088	1,150	1,138	1,285	891	1,261	1,309	1,215	1,121	1,226
Co (ppb)	1.6	1.4	1.7	0.4	0.4	1.9	0.9	0.2	0.3	0.4	0.9	1
Cr (ppb)	2.8	2.4	2.6	1.3	1.3	4.8	1.7	1.1	1.5	1.5	1.6	1.8
Cu (ppb)	541	24	276	89	105	351	165	52	70	96	167	192
Fe (ppb)	4,926	4,288	5,323	1,509	1,705	6,491	3,074	667	1,215	1,591	3,026	3,349
K (ppb)	3,363	3,350	3,343	3,327	3,305	3,410	3,361	3,320	3,348	3,287	3,333	3,331
Mg (ppb)	15,910	13,430	9,758	9,633	10,240	29,890	9,110	9,158	9,305	9,462	9,051	9,157
Mn (ppb)	2,067	2,058	2,818	498	503	1,975	1,401	149	301	534	1,369	1,638
Mo (ppb)	2	2	2	1.9	1.9	2.2	1.8	1.8	1.8	1.8	1.8	1.8
Na (ppb)	17,340	17,310	17,280	17,110	16,980	17,540	17,370	17,040	17,210	16,840	17,250	17,230
Ni (ppb)	30.6	21.7	11.8	4.6	5.8	80	7.5	3	2.8	3.9	6.3	7.2
P (ppb)	1,758	1,378	1,336	308	378	3,224	771	134	199	299	756	847
Pb (ppb)	5,702	4,781	3,585	755	1,055	13,200	1,752	217	384	715	1,742	1,962
S (ppm)	27.2	26.9	26.8	26.7	26.6	27.1	27	26.6	26.9	26.2	26.8	26.4
Se (ppb)	0.2	0.2	0.2	0	0	0.1	0	0.2	0.1	0.2	0.1	0.1
Si (ppb)	10,530	7,660	3,636	2,830	3,573	26,740	2,680	2,258	2,422	2,687	2,661	2,826
Sn (ppb)	5.6	4.2	3.8	1.8	2	8.9	2.2	1	1.3	1.6	2.2	2.5
Sr (ppb)	129	128	129	125	125	131	128	125	125	125	127	127
Tl (ppb)	8.2	6.1	6.2	1.1	2.2	16.9	3.7	0.5	0.8	1.3	3	3.1
U (ppb)	2.7	2	1.6	0.5	0.6	5.6	0.9	0.3	0.4	0.5	0.9	1
V (ppb)	24.3	19.8	16.3	6.8	8.3	51.3	10.2	6.5	7.8	8	10.9	11.7
Zn (ppb)	2,520	1,622	1,305	593	796	3,652	752	293	395	603	739	856

Correlation between lead, phosphorus and aluminum

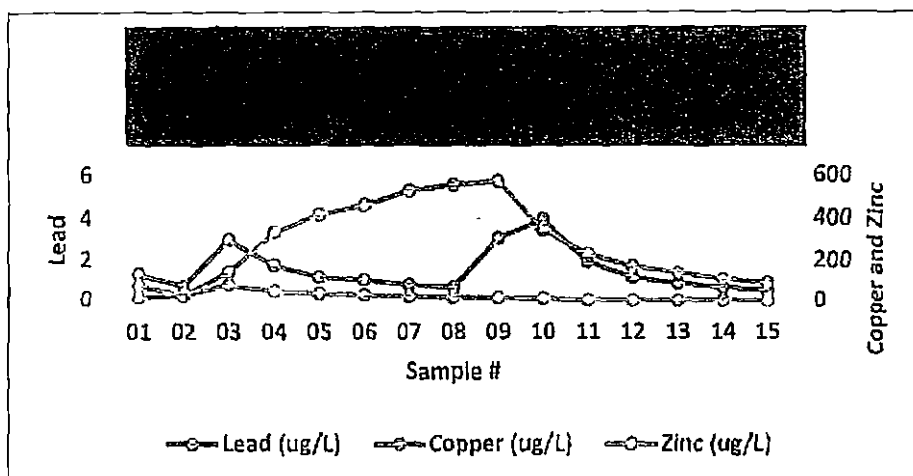
The correlation of lead and phosphate, as well as lead and aluminum, indicate that the samples were captured scale and sediment that had formed inside the pipes while the City of Flint was purchasing water from Detroit. The absence of these chemicals in the current treatment provided by Flint indicate that these elements were not in the water passing through the pipes, but came from the scales inside the service line which had disintegrated into the water or were dislodged into the water.



U.S. EPA Region 5 sampling

[REDACTED] residence (following replacement of service line)

Following the replacement of the [REDACTED] original service line, a series of 15 sequential samples were collected from the kitchen tap to measure the lead levels and other parameters to ensure that the high lead from the original service line had not contaminated the interior plumbing at the [REDACTED] home. With the exception of two areas, lead levels were low throughout the [REDACTED] plumbing following the service line replacement. The two sources of lead that were still detected in the plumbing are likely the water meter (Sample 3) and the new external service shut-off valve (Samples 9-11). Although new brass plumbing components must be lead-free, there can still be some lead that is released from these components.



[REDACTED] ([REDACTED] home)

After Service Line Replacement

Sample #	Site Description	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
01	Kitchen	13.1	1.3	70.9	U	0.171	U
02	Kitchen	20.1	0.687	23.2	U	0.117	U
03	Kitchen	141	3.01	76.8	U	0.144	U
04	Kitchen	336	1.76	45.4	U	0.151	U
05	Kitchen	419	1.17	32.2	U	0.149	U
06	Kitchen	463	1.03	24.8	U	0.149	U
07	Kitchen	529	0.8	19.6	U	0.146	U
08	Kitchen	554	0.666	14.9	U	0.147	U
09	Kitchen	571	3.07	11.6	U	0.195	U
10	Kitchen	345	3.93	10.3	U	0.282	U
11	Kitchen	233	1.94	0	U	0.283	U

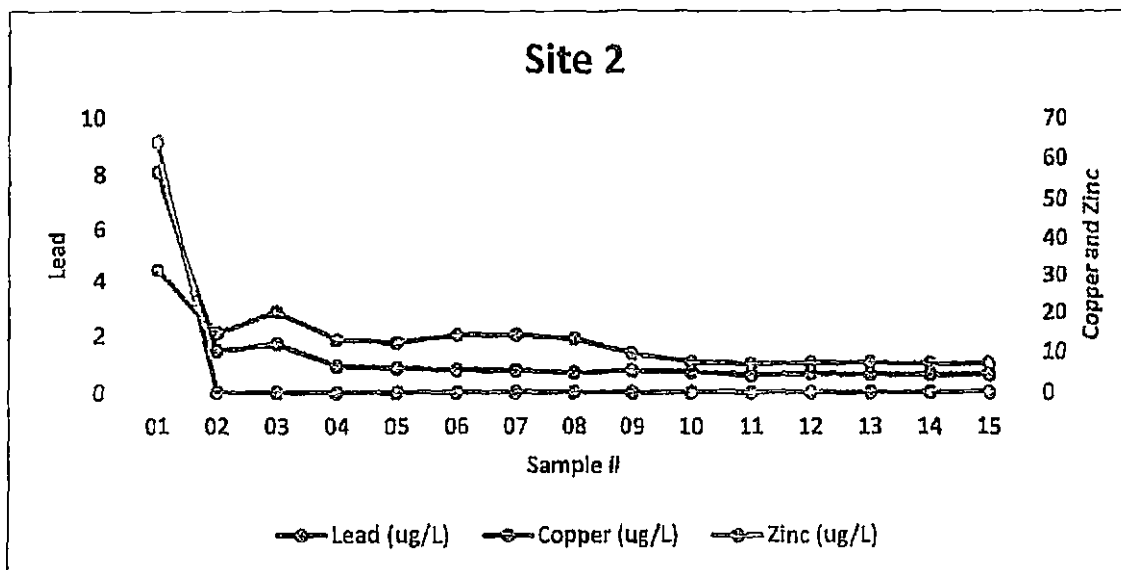
[REDACTED] ([REDACTED] home)

After Service Line Replacement

Sample #	Site Description	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
12	Kitchen	171	1.17	0	U	0.290	U
13	Kitchen	139	0.864	0	U	0.292	U
14	Kitchen	110	0.67	0	U	0.294	U
15	Kitchen	91.5	0.505	0	U	0.297	U
16	Bathroom	29.7	5.52	71.3	U	0.259	U
17	Water Heater	70.4	31.7	883	U	0.540	0.0877
18	Water Heater	35	9.74	346	U	0.0870	U

Site #2 (Bryant Street)

Based on the results found at this home, it does not appear that any portion of the service line is made of lead, and as a result, the lead levels are low in most samples. The exception is in Sample 1 which reflects water within approximately 15 feet of the kitchen tap and is likely due to brass components in the faucet, underlying valves and fixtures.



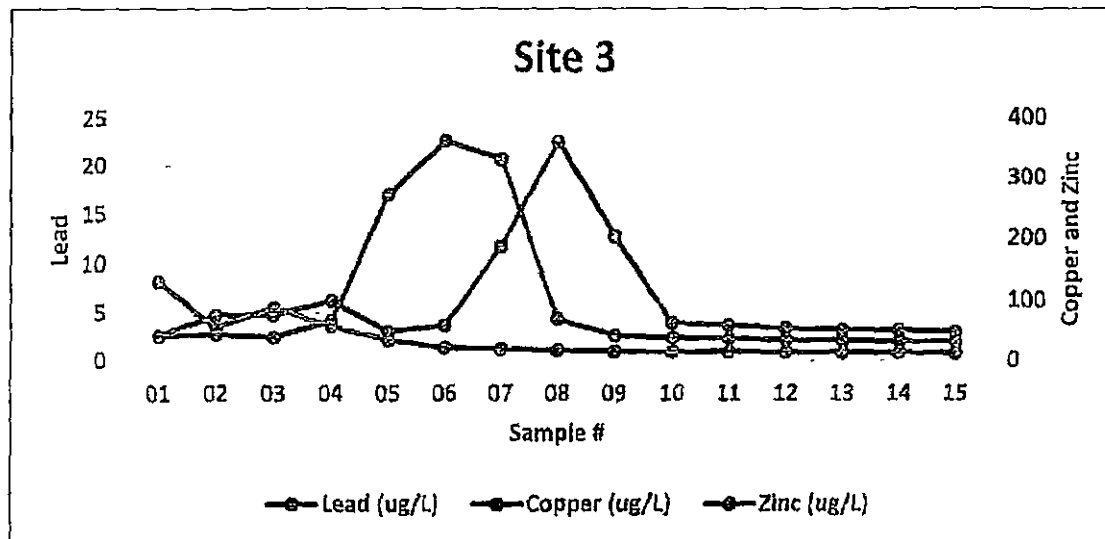
Site 2

(Note: U for Zinc replaced with 0 to show on graph)

Sample #	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
01	31.1	8.11	64	U	0.0307	U
02	14.7	1.46	U	U	0.0302	U
03	20	1.72	U	U	0.0302	U
04	13	0.933	U	U	0.0301	U
05	12.3	0.862	U	U	0.0311	U
06	14.2	0.795	U	U	0.0298	U
07	14.2	0.769	U	U	0.0311	U
08	13.3	0.691	U	U	0.0317	U
09	9.6	0.774	U	U	0.0319	U
10	7.57	0.715	U	U	0.0313	U
11	7.04	0.611	U	U	0.0301	U
12	7.3	0.655	U	U	0.0336	U
13	7.37	0.644	U	U	0.0308	U
14	7.09	0.631	U	U	0.0313	U
15	7.05	0.621	U	U	0.0300	U

Site #3 (Bryant Street)

Based on the results found at this home, it appears that the portion of the service line from the external service shut-off valve to the water main is made of lead as indicated by the increase in lead levels in samples 7 through 9.



Site 3

Sample #	Copper (ug/L)	Lead (ug/L)	Zinc (ug/L)	Cadmium (mg/L)	Iron (mg/L)	Phosphorus (mg/L)
01	40.7	2.63	132	U	0.0622	U
02	44.4	4.77	55.3	U	0.249	U
03	39.3	4.79	88.8	U	0.179	U
04	66.8	6.26	57.2	U	0.346	U
05	272	3.07	34.2	U	0.105	U
06	362	3.7	21.4	U	0.0598	U
07	331	11.7	19.5	U	0.0512	U
08	69.9	22.5	16.6	U	0.0399	U
09	42.5	12.7	15.1	U	0.0480	U
10	38.4	3.94	14.4	U	0.0489	U
11	37.5	3.72	14.5	U	0.0492	U
12	34.8	3.39	13.6	U	0.0481	U
13	33.1	3.23	13.1	U	0.0484	U
14	32.8	3.2	13	U	0.0480	U
15	31.4	3	12.3	U	0.0490	U

Analysis of [REDACTED] original service line pipe (galvanized iron portions)

Lead can also be found in galvanized pipe coatings as a contaminant in the zinc that is used to coat the surface of iron pipe in the galvanizing process. As such, two sections of the [REDACTED] original service line were analyzed for lead content.

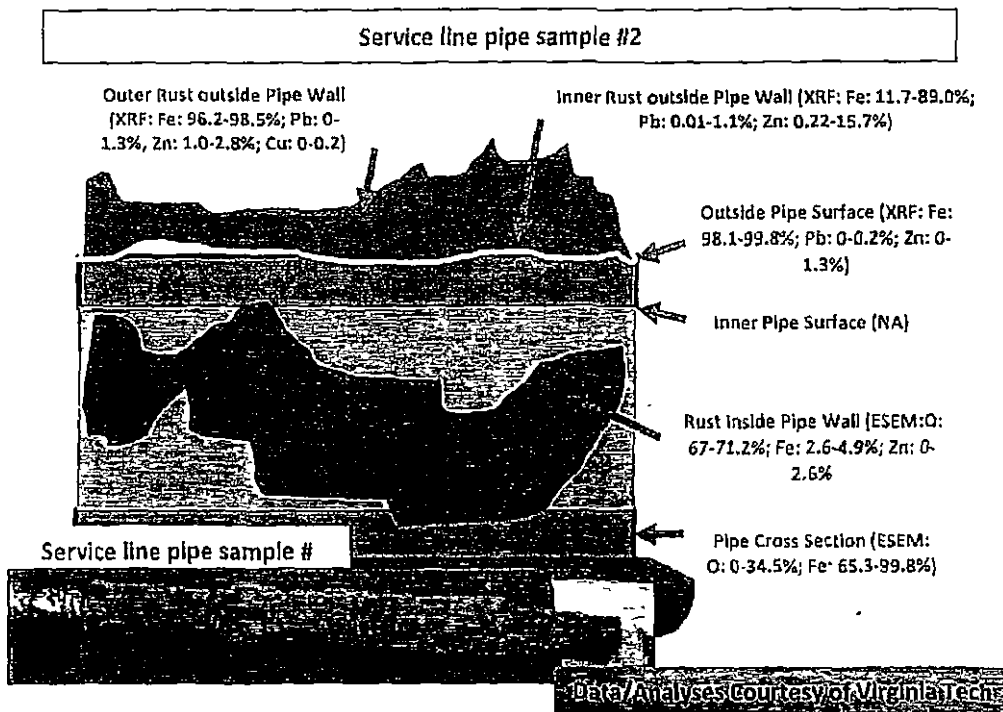
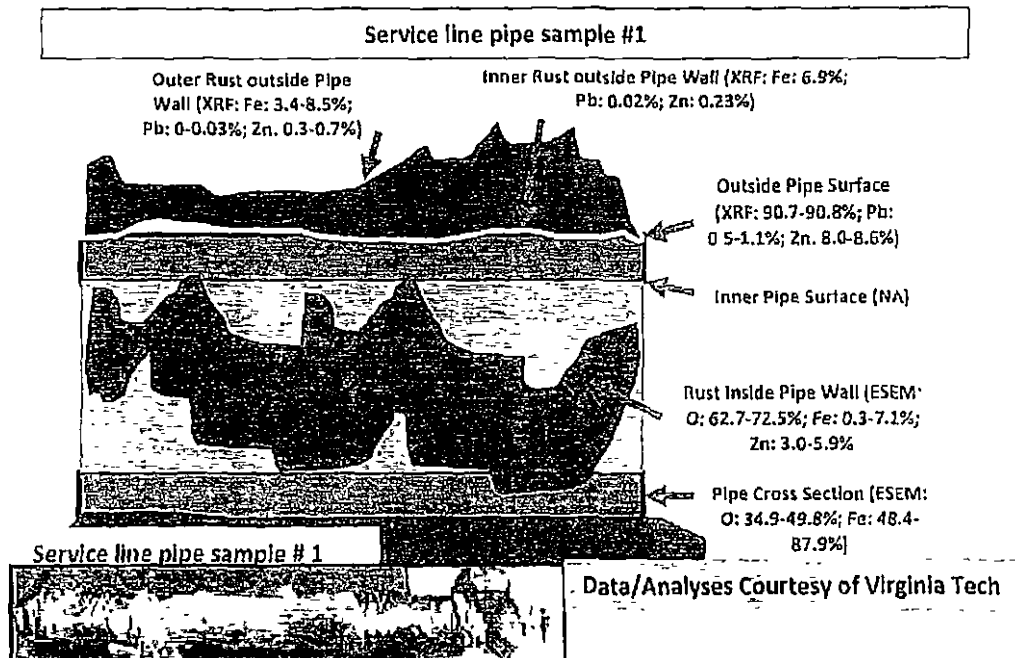
The images and data presented below are for a typical range of galvanized iron pipe.

Lead Content of Galvanized Iron Pipe - Examples

China	Turkey	US	No ID
			
Inside: Fe: 16.8-94.3%, Zn: 0.1-83.7%, Pb: 0-0.7%	Inside: Fe: 13.1-26.8%, Zn: 71.3-85.9%, Pb: 0.4-0.9%	Inside: Fe: 0.9-37.4%, Zn: 61.3-96.8%, Pb: ND	Inside: Fe: 3.9-69.1%, Zn: 29.3-93.1%, Pb: 0-1.3%
			
Outside: Fe: 4.6-12.6%, Zn: 81.5-94.1%, Pb: 1.0-1.1%	Outside: Fe: 37.6-57.1%, Zn: 41.6-60.1%, Pb: 0.8-1.0%	Outside: Fe: 1.8-14.9%, Zn: 19.9-98.1%, Pb: ND	Outside: Fe: 7.2-13.0%, Zn: 86.2-91.7%, Pb: 0.5-0.8%

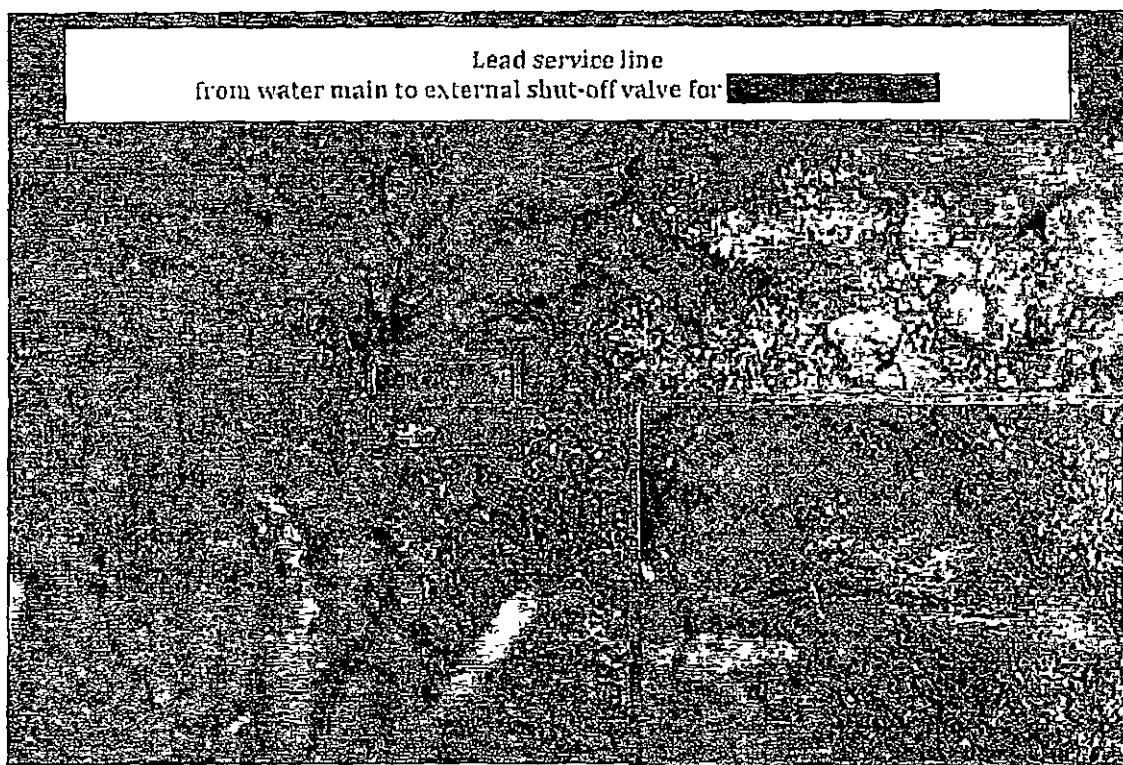
Data/Analyses Courtesy of Virginia Tech

Below are the results of the galvanized pipe analyses conducted by Virginia Tech on the two sections of galvanized iron pipe from the [REDACTED] original service line. The analyses indicate that the [REDACTED] original service line was a typical galvanized iron pipe.



Lead portion of the [REDACTED] original service line

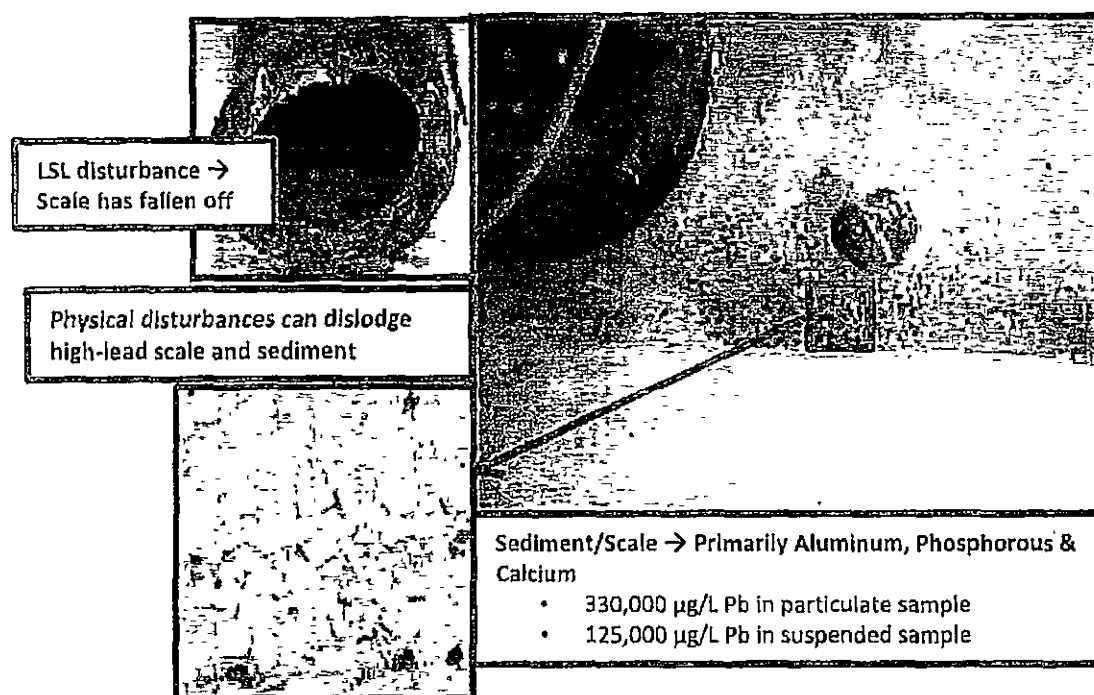
Lead service lines can contribute up to 75 percent of the total mass release into the water. The portion of the [REDACTED] original service line from the water main to the external shut-off valve at the corner of [REDACTED] and Bryant Street is made of lead and is estimated to be approximately 25 feet in length.



Appendix C – Additional Information

Physical disturbance of lead service lines

A recent EPA study indicates that physical disturbances to lead service lines or in proximity to lead service lines can cause the dislodging of the protective scales from within the lines. The photograph below shows the scale that was dislodged from inside a lead service line during routine maintenance work in another city due to a physical disturbance of the line. The dislodged scale and sediment contained a very high concentration of lead.



Lead service line disturbances were found to be a common factor for the majority of sites with high lead levels. It is also possible that low water usage may play a role in sites with the highest lead levels.

Lead service line scale analyses conducted by EPA's Office of Research and Development or obtained from peer-reviewed published literature from cities across the U.S. and in Canada (summarized below) show that scales within lead service lines can contain very high concentrations of lead. The yellow highlighted column in the table below shows the percentage of lead that has been found within different scales inside of lead service lines.

Lead & Element Percentages in Important Corrosion Byproduct Solids							
Mineral Name	Formula	% Pb	% C	% O	% S	% P	% Cl
litharge, massicot	PbO	97.80	0.00	7.20	0.00	0.00	
plattnerite, scrutinyite	PbO ₂	86.60	0.00	13.40	0.00	0.00	
Cerussite	PbCO ₃	77.50	4.50	18.00	0.00	0.00	
Hydrocerussite	Pb ₃ (CO ₃) ₂ (OH) ₂	80.10	3.10	16.50	0.00	0.00	0.00
Plumbonacrite	Pb ₁₀ (CO ₃) ₆ (OH) ₂ O	81.30	2.80	15.70	0.00	0.00	0.00
Anglesite	PbSO ₄	68.50	0.00	21.10	10.60	0.00	0.00

Lead & Element Percentages in Important Corrosion Byproduct Solid							
Mineral Name	Formula	%Pb	%C	%O	%S	%P	%Cl
Leadhillite, Susannite, MacPhersonite	$Pb_4(SO_4)(CO_3)_2(OH)_2$	76.80	2.20	17.80	3.00	0.00	0.00
Hydroxypyromorphite	$Pb_5(PO_4)_3OH$	77.43	0.00	15.55	0.00	6.95	0.00
Chloropyromorphite	$Pb_5(PO_4)_3Cl$	76.38	0.00	14.15	0.00	6.85	2.61
Tertiary Lead Orthophosphate	$Pb_3(PO_4)_2$	76.60	0.00	15.80	0.00	7.60	0.00
Lead(II) orthophosphate	$Pb_3(PO_4)_2$	76.60	0.00	15.80	0.00	7.60	0.00

While visiting the [REDACTED] home, two fresh patches of asphalt were seen along the parkway where the [REDACTED] original service line was located. The jarring and vibration associated with excavation can dislodge the high lead-bearing scales from within the service line pipes.



Recent patch (#1) of asphalt along curb next to the parkway where the [REDACTED] service line runs.

Photograph taken by U.S. EPA on April 27, 2015



Recent patch (#2) of asphalt along curb next to the parkway where the [REDACTED] service line runs.

Photograph taken by U.S. EPA on April 27, 2015



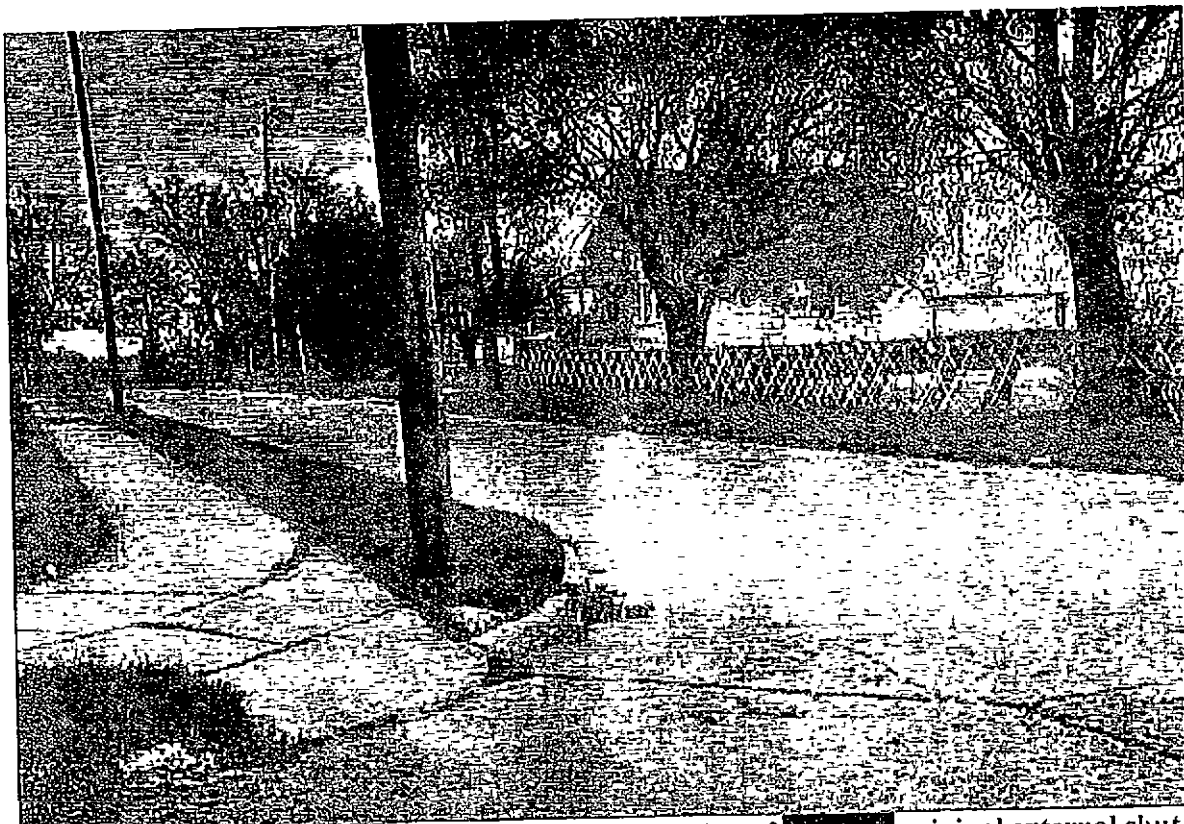
July 2011 image [REDACTED] (view from [REDACTED] toward Bryant Street).

Google 'Street View' Image 1 captured in July 2011 shows no patches in street along curb next to the parkway where the [REDACTED] service line runs toward Bryant Street, indicating that the physical disturbances occurred after the date this image was captured (July 2011).



July 2011 image of [REDACTED] (view from Bryant Street toward [REDACTED]).

Google 'Street View' Image 2 captured in July 2011 shows no patches in street along curb next to the parkway where the [REDACTED] service line runs toward Bryant Street, indicating that the physical disturbances occurred after the date this image was captured (July 2011).



Corner of [REDACTED] and Bryant Street (location of [REDACTED] original external shut-off valve).

Photograph taken by EPA on April 27, 2015 shows no visible signs of physical disturbances in the vicinity of the lead portion of the [REDACTED] service line from the external shut-off valve to the water main on Bryant Street.