
STATE OF MICHIGAN CONTRACT NO. 271N3200089

CITY OF FLINT WATER SUPPLY ASSESSMENT
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Submitted by:

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1. INTRODUCTION

Tucker, Young, Jackson, Tull, Inc. (TYJT), at the request of the State Treasurer performed an analysis of the water supply options being considered by the City of Flint. The City of Flint is presently supplied potable water from the Detroit Water and Sewerage Department (DWSD). This supply is from a single 72-inch water main that terminates at a master meter located at Potter and Baxter. Additionally, downstream of the DWSD master meter, Flint supplies its customer Genesee County. The City of Flint also operates a water treatment plant that uses the Flint River as its source of supply to provide back up and redundancy to the DWSD supply as required by MDEQ

The Karegnondi Water Authority (KWA) is planning on constructing a raw water supply system that could provide Lake Huron water to the Flint Water Treatment Plant. Flint's existing plant would be upgraded to treat the new raw water source.

The State Treasurer has appointed an emergency financial manager for the City of Flint. As such the Treasurer has requested TYJT to provide an analysis of the water supply options to assist the Treasurer in determining any potential risk and the best course going forward for supplying potable water to the City of Flint.

Report Organization

The following sections of this report are described below:

Section 2 – The basis of the analysis is described in this section. The options include the KWA option and several options offered by DWSD.

Section 3 – A significant amount of information and data was collected including memorandums, reports, drawings, financial reports, and other documents. This section summarizes the information used in the analysis.

Section 4 – This section describes the evaluation of the cost of supply for the Flint options. The costs are comprised of the initial cost of operations plus the annual rate of escalation/inflation.

Section 5 – The evaluation process used to analyze the construction costs associated with the KWA supply system is described in this section. Additionally, the cost of financing the capital requirements is described.

Section 6 – This section presents the financial review of the options considered to supply potable water to Flint. A summary of these options is also provided.

Section 7 – In addition to the financial analysis other considerations were identified that should be considered in understanding the risks and determining the best option to supply Flint. They include items related to cost, redundancy and reliability, and Flint's ability to control their future cost of water supply.

2. FLINT WATER SUPPLY OPTIONS

Two water purveyor options were evaluated; the KWA water supply system and continued supply from DWSD. Both suppliers would provide water from Lake Huron as the source. The KWA system is a raw water supply, which means that the water would have to be treated by Flint before distributing the potable water to its customers. The DWSD supply is potable or “finished” water and would not need additional treatment.

Additionally, an option for the Flint WTP to supply the City of Flint without being supplied from either DWSD or KWA was initially considered. The preliminary investigation evaluated the cost associated with the required improvements to the plant and to the Flint River dam system. Although it appeared that this was a viable option, Flint in a meeting on December 20, 2012 with the Treasury, stated that the City did not want to pursue the option and it is no longer being considered.

Karegnondi Water Authority (KWA) Lake Huron Water Supply

The KWA water supply system schematic is shown in Figure 2-1. The system is comprised of an intake in Lake Huron that supplies water to the Lake Huron Pump Station (LHPS). The LHPS lifts the water and pumps it through an approximately 22 mile long 60-inch pipeline. The pipeline terminates at a 5 MG reservoir and is then pumped from the Intermediate Pump Station (IPS) through approximately 26 miles of 60-inch and 18 miles of 30-inch pipeline to the existing Flint WTP. Downstream of the IPS, approximately half way to the Flint WTP, the 60-inch line would also supply a new Genesee County WTP.

The raw water transmission system has a 60 MGD capacity and is sized to deliver a maximum of 18 MGD to the Flint WTP with an average day supply of 12 MGD. Improvements at the Flint WTP would also be required to treat the lake water as the plant is currently designed to treat the Flint River water.

The term of the KWA contract for Flint is 40 years.

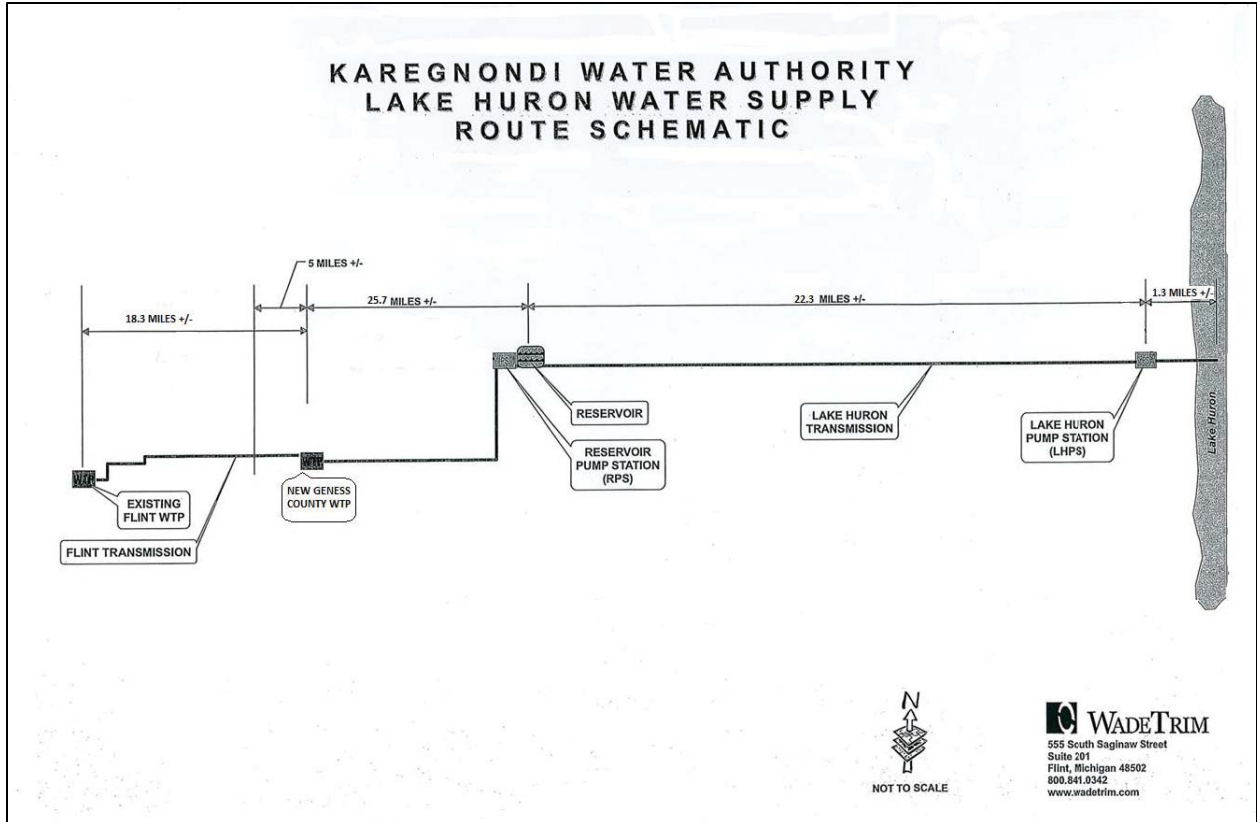


Figure 2-1: KWA Raw Water System

DWSD Water System

The DWSD system schematic is shown in Figure 2-2. Flint is currently supplied by DWSD at Master Meter FL-1, located at Potter and Baxter. Flint typically gets its water from the Lake Huron WTP, located in Fort Gratiot, Michigan; near the Lake Huron shoreline. Water is treated and pumped at the Lake Huron WTP and supplied through a 120-inch pipeline to an intermediate pump station called the Imlay Pump Station. The Imlay Pump Station has 20 MG of reservoir capacity. Depending on the time of year and the DWSD system demand, water is either bypassed directly to Flint or it is re-pumped at Imlay. It should be noted that the DWSD supply to Flint is part of a very large water system and during emergencies or outages water can be supplied from the south up to Flint in lieu of the Lake Huron facility.

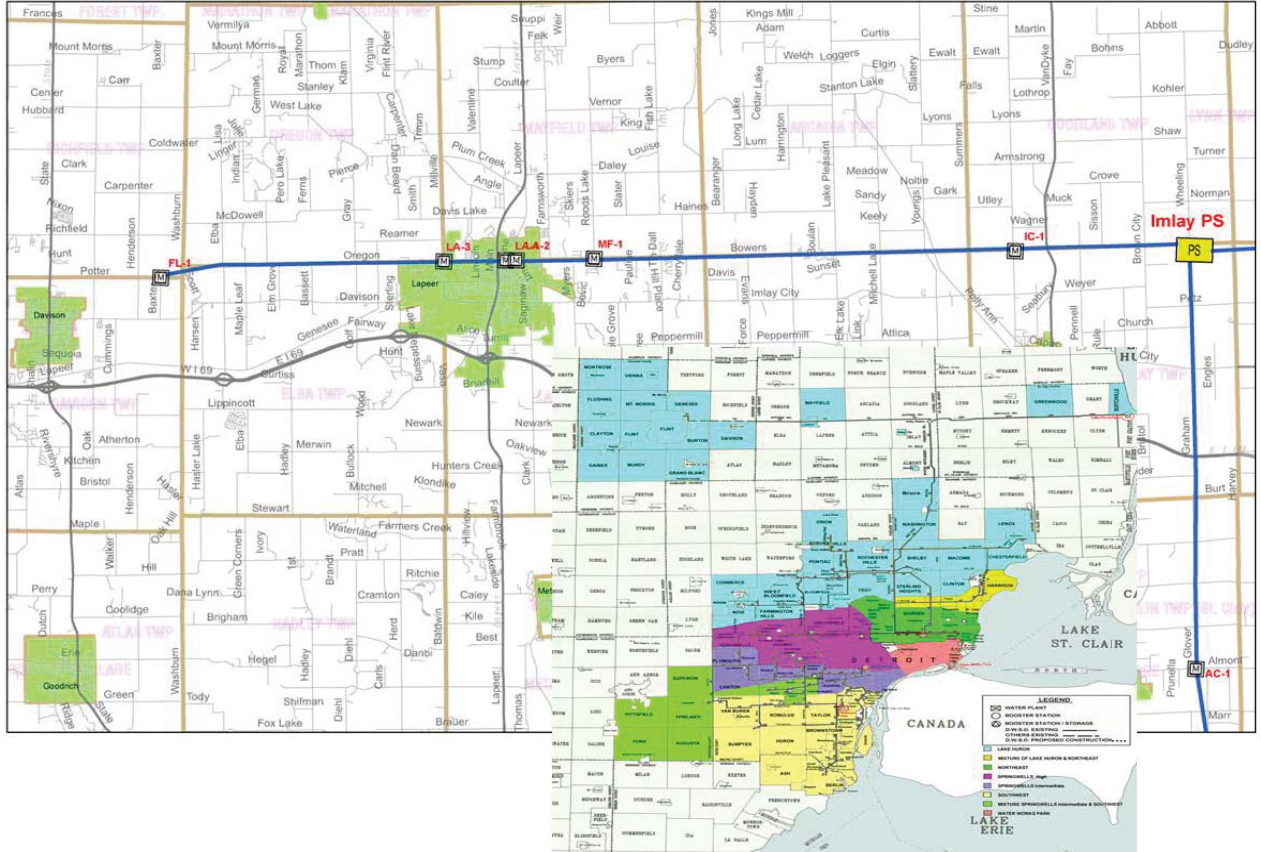


Figure 2-2: DWSD Water System

The pipeline from Imlay to FL-1 is a 72-inch pipeline. It has been estimated that the 72-inch line serving Flint has a capacity in excess of 90 MGD.

DWSD has presented several contractual options to Flint and all of them are based on Flint signing a new 30 year contract. The options shown in Table 2-1 are based on two different supply points; one at the current master meter location FL-1 at Potter and Baxter (P&B) and the other at the location of the Imlay Pump Station. The reason for the varying options is to provide a lower water rate at the Imlay Station, since the DWSD rate formula is based on distance and elevation factors related to the supply location.

The rates are also dependent on the maximum amount of water DWSD supplies. As example, if DWSD supplies a maximum day demand of 18 MGD that would equal the entire amount of water required by Flint.

For the options less than the maximum of 18 MGD means that the Flint WTP would supplement the difference by supplying water treated from the Flint River. These options are known as “blending” and would allow for Flint to blend two sources of water to supply its customers; the Flint River using the Flint WTP and Lake Huron from DWSD system.

| Description | Average Day Demand |
|-------------------------------------|--------------------|
| 18 MGD Maximum Day Customer – FL-1 | 12 MGD |
| 12 MGD Maximum Day Customer – FL-1 | 8 MGD |
| 8 MGD Maximum Day Customer – FL-1 | 8 MGD |
| 12 MGD Maximum Day Customer - Imlay | 12 MGD |
| 8 MGD Maximum Day Customer - Imlay | 12 MGD |

Table 2-1: DWSD Supply Options

3. DATA COLLECTION

During the course of the investigation several documents were used to perform the analysis. The names of the documents are listed below for reference.

KWA and Flint

- Preliminary Engineering Report, Lake Huron Water Supply Karegnondi Water Authority, September 2009;
- Analysis of the Flint River as a Permanent Water Supply for the City of Flint, July 2011;
- Cost Comparison, KWA vs. DWSD, Letter to Mr. Kurtz, October 31, 2012;
- Lake Huron Supply Study, KWA, Appendix 20, October 2012 Preliminary Report Update, Final Report (DRAFT), October 4, 2012;
- Articles of Incorporation of Karegnondi Water Authority, endorsed in 2010;
- Karegnondi Water Authority Bylaws, October 26, 2010;
- KWA Raw Water Supply Contract;
- Flint WTP Statement of Revenues and Expenditures 09' – 12';
- GCDC Division of Water and Waste Services Financial Statements 03' – 11'; and
- Assorted emails with further clarification of questions and documentation.

DWSD

- Historical Rates and Charges to Flint 04' – 13';
- Historical Rates and Charges to Flint with Hypothetical Model Contract 10' – 13';
- 2013 Rates and Charges for the following options:
 - 18 MGD Maximum Day Customer at FL-1;
 - 12 MGD Maximum Day Customer at FL-1 (Flint blending*);
 - 8 MGD Maximum Day Customer at FL-1 (Flint blending*);
 - 12 MGD Maximum Day Customer at Imlay (Flint blending*);
 - 8 MGD Maximum Day Customer at Imlay (Flint blending*); and
- Assorted emails with further clarification of questions and documentation.

- * Flint blending based on DWSD supplying two-thirds and Flint one-third of 12 MGD average day demand.

Two meetings were also held; one with DWSD and one with Flint and Genesee County representing KWA. The meetings were held on November 19, 2012 and November 20, 2012, respectively. Minutes from these meetings are included in Appendix A.

4. COST OF SERVICE

Information provided by DWSD, Flint, and representatives of the KWA were used in the cost of service evaluation. To evaluate the annual escalation/inflation rate over the planning period, the rate adjustment for DWSD was estimated based on the recent rate adjustment history. For the KWA system both the estimated cost of operations when the system begins supplying water and the annual rate adjustment or inflation was evaluated. The existing cost of operations and escalation for the Flint WTP was based on actual costs provided and then adjusted depending on the scenario considered. This section describes the evaluation process and the rates used in the analysis.

DWSD Water Supply

The City of Flint has been a customer of DWSD since 1967. The Flint WTP has been maintained as a backup to the DWSD system. As indicated previously, several options were provided by DWSD depending on the type of service Flint was to select. The unit cost of water for each of these options is shown in Table 4-1. These rates are based on DWSD's FY13, which are current until July 2013.

| Description | Average Day Demand (MGD) | Unit Rate (\$/MCF) |
|-------------------------------------|--------------------------|--------------------|
| 18 MGD Maximum Day Customer – FL-1 | 12 | 16.37 |
| 12 MGD Maximum Day Customer – FL-1 | 8 | 16.31 |
| 8 MGD Maximum Day Customer – FL-1 | 8 | 12.68 |
| 12 MGD Maximum Day Customer - Imlay | 12 | 14.38 |
| 8 MGD Maximum Day Customer - Imlay | 12 | 11.11 |

Table 4-1: Cost of DWSD Supply Options

To determine annual escalation rate, DWSD's last 10 years of history was used along with other large urban water systems in Michigan. The water systems used for benchmarking comparison were: Lansing, Grand Rapids, and Saginaw.

Table 4-2 identifies the annual and average rate of increase to Flint based on supplying water either to the current FL-1 at Potter and Baxter or Imlay. Note the last three years of the rates (FY 2011 through FY 2013) assumes that Flint's cost would be based on the new 30 year contract; FY 2011 being the first year that the new contract was available.

| Fiscal Year | Average Unit Cost (\$/MCF) | Annual Change (%) |
|----------------|----------------------------|-------------------|
| 2004 | 11.06 | |
| 2005 | 10.24 | -7.4 |
| 2006 | 10.56 | 3.1 |
| 2007 | 11.09 | 5.0 |
| 2008 | 11.35 | 2.3 |
| 2009 | 13.07 | 15.2 |
| 2010 | 11.73 | -10.3 |
| 2011 | 13.89 | 18.4 |
| 2012 | 15.08 | 8.6 |
| 2013 | 16.24 | 7.7 |
| Average | | 4.4% |

From FL-1

| Fiscal Year | Average Unit Cost (\$/MCF) | Annual Change (%) |
|----------------|----------------------------|-------------------|
| 2004 | 11.06 | |
| 2005 | 10.24 | -7.4 |
| 2006 | 10.56 | 3.1 |
| 2007 | 11.09 | 5.0 |
| 2008 | 11.35 | 2.3 |
| 2009 | 13.07 | 15.2 |
| 2010 | 11.16 | -14.6 |
| 2011 | 12.23 | 9.6 |
| 2012 | 13.28 | 8.6 |
| 2013 | 14.32 | 7.8 |
| Average | | 2.9% |

From Imlay

Table 4-2: Recent DWSD Water Rates

Audited financial reports were used to determine the rate of inflation associated with other three large municipal systems. The results are shown in Table 4-3.

| Water Systems | Years Evaluated | Average Rate (%) |
|---------------|-----------------|------------------|
| Lansing | 05'-12' | 4.6 |
| Grand Rapids | 04'-11' | 1.6 |
| Saginaw | 04'-11' | 7.0 |

Table 4-3: O&M Inflation Rates of Other Large Water Systems

Based on the information analyzed from DWSD and the other communities, it was determined that a fair annual rate of inflation for operations and maintenance cost for the analysis should be 4.4%. The 4.4% has historical significance from Flint's current water supplier and falls within the range of the other communities.

KWA Water Supply

The initial projected O&M cost for the KWA supply would be comprised of KWA's O&M costs as well as Flint's O&M costs. Because there was limited information provided, the initial estimated rate of \$1.50/MCF was used. This rate is based on information from the cost comparison analysis attached to the letter to Mr. Kurtz, dated October 31, 2012.

The KWA cost evaluation used an annual O&M inflation rate of 5%. To validate this rate a similar analysis to DWSD's operations and maintenance annual rate of inflation was used. First, in discussions with Flint and the Genesee County Drain Commission (GCDC), they believed that the annual rate of inflation for the new KWA system would be similar to the GCDC Water & Waste Services (WWS). Additionally, two large transmission systems were used to benchmark the inflation rates: the Southeastern Oakland County Water Authority (SOCWA) and the Ypsilanti Utility Community Authority (YUCA). Although both of these systems transmit finished water opposed to raw water, they were considered similar enough for comparison as they are comprised of only large water mains, pumping facilities and storage.

Once again audited financial statements were used to calculate the inflation rates. A summary of the findings are shown in Table 4-4. Based on the fact that the information analyzed showed a large difference between the two systems, it was determined that the KWA assumption of 5% was a good rate of inflation to use in the financial analysis. This rate is almost equally between the GCDC rate and the other two transmission systems.

| Systems | Years Evaluated | Average Rate (%) |
|----------|-----------------|------------------|
| GCDC WWS | 03' – 11' | 10.5 |
| SOCWA | 04'-12' | -- |
| YUCA | 04'-12' | 0.7 |

Table 4-4: O&M Inflation Rates of Other Comparable Systems to KWA

Flint WTP

The Flint WTP currently serves as a backup supply to the DWSD service to Flint. To maintain backup operations, the City of Flint operates the plant approximately 20 days each year. Flint indicated that the average production rate when they operate is 11 MGD.

For the blending options and the KWA supply considered, Flint would be required to operate its plant all year around. Therefore, their operating and maintenance costs were evaluated and adjusted to determine an annual cost associated with year-round operations.

The Flint WTP provided three years of operating costs for the assessment. Additionally, reports listed in Section 3 were also used as reference to determine both operating costs for the plant processing Flint River water (blending options) and Lake Huron raw water (KWA option).

Major cost centers were analyzed to estimate annual operation and maintenance. They included: labor, utilities, chemicals and residual management. In general, as recommended by the Flint plant staff, labor and overhead were increased from the current costs by two-thirds. Additionally, variable costs for power, chemicals and residual cost were increased to estimate full time treatment at the Flint WTP. Data from the KWA Preliminary Report and annual operating data for the Flint WTP (provided separately) were analyzed to make these forecasts.

The annual operating and maintenance costs developed for Flint WTP used are shown in Table 4-5.

| Source of Supply | Average Daily Production (MGD) | Estimated Annual O&M Cost |
|----------------------------------|--------------------------------|---------------------------|
| Flint River (Blending with DWSD) | 4 | \$5,895,097 |
| Lake Huron (Supplied by KWA) | 12 | \$7,913,118 |

Table 4-5: FY 13 O&M Costs for Year-round Operations

It was determined that a fair annual rate of inflation for operations and maintenance cost for the Flint WTP plant should be 4.51%. The 4.51% is an average of Lansing, Grand Rapids and Saginaw facilities.

5. CAPITAL REQUIREMENTS

Large capital investments would be required by Flint and GCDC to construct the KWA supply system. Furthermore, some of the options presented by DWSD (supply point from Imlay) would require the purchase by Flint of DWSD's 72-inch water main. Performing the financial analysis; therefore, required an analysis of the KWA construction cost estimate for the transmission system and Flint WTP improvements.

Revenue bonds were also identified as the source of financing the new supply system and associated improvements. This section describes the assumptions made and the interest used for financing the improvements.

KWA Supply System

The most current cost estimate of the KWA system was presented in the document titled; Lake Huron Supply Study, KWA, Appendix 20, October 2012 Preliminary Report Update, Final Report (DRAFT), October 4, 2012. The cost of construction is estimated at \$272,421,558. Flint's portion would be 30% or \$81,726,467.

Due to the significance of this expenditure, a detailed review of the cost was performed and is presented in this section. The analysis was performed based on the main elements of the supply system: the lake intake, the two pumping stations, and the transmission pipeline. Additionally, an analysis was performed related to construction contingencies and other costs such as engineering, legal, and administration.

Lake Intake

KWA representatives indicated in a meeting in November that the design documents for the intake were at 90% and that it was planned for advertisement in January 2013. A summary of the estimate is shown in Table 5-1.

| Description | Estimate |
|-----------------|---------------------|
| Intake and Crib | \$22,076,850 |
| ELAC at 25% | 5,519,213 |
| Property | 2,300,000 |
| Total | \$29,896,063 |

Table 5-1: KWA Intake Cost Estimate

Based on the evaluation, it appeared that the cost estimate was reasonable. Given that the design was nearly complete, the engineering, legal, administration, and construction contingencies (ELAC) at 25% were also found to be appropriate.

Pumping Stations

KWA representatives indicated that the pump stations were estimated at a level of design less than 15%. Therefore, in addition to an evaluation of their cost estimate, other water pumping station costs were used for comparison. Additionally, contractors were also contacted for costs. Table 5-2 summarizes the KWA cost estimate compared to our cost estimate performed for the Treasury.

| Description | KWA | Estimate | TYJT | Estimate |
|--|-----|---------------------|------|---------------------|
| Pumping Stations | | \$24,618,080 | | \$54,573,314 |
| Land for Intermediate Pump Station and Reservoir | | -- | | 75,000 |
| Subtotal | | \$24,618,080 | | \$54,648,314 |
| ELAC for Construction | 25% | 6,154,520 | 30% | 16,394,494 |
| Total | | \$30,772,600 | | \$71,042,808 |

Table 5-2: Pumping Stations Cost Estimate

Two things to note regarding the difference in the cost estimates; firstly, there is a large difference in the cost estimates of the pumping stations. The estimate developed for the Treasury used several other pumping stations construction costs from Southeastern Michigan and discussions with contractors. These costs were then computed on a \$/MG's for comparison.

Secondly, our estimate for the Treasury is based on an ELAC of 30% instead of KWA's 25%. Although 25% was acceptable for the intake, it is believed to be too low for the pumping station estimate given that the engineering effort is less than 15%.

Transmission Main

Although the specific route for the transmission main was not provided, an estimate was calculated based on the general information provided. Once again, the KWA estimate was based on a level of design less than 15%. The estimate performed for the Treasury used the line items provided by KWA for the pipeline and also consulted with contractors to evaluate the cost of construction. The comparison is shown in Table 5-3.

Although the cost of construction of the pipeline is similar, a value of 30% was used for ELAC due to the level of design. Additionally, KWA did not believe there would be any additional costs for easements; however, this did not seem practical. Therefore an estimate for acquiring the easements was added to the Treasury estimate and is based on the 277 easements identified by KWA. The cost shown includes surveying, legal, engineering, administration, etc.

| Description | KWA | Estimate | TYJT | Estimate |
|-----------------------|-----|----------------------|------|----------------------|
| Transmission Mains | | \$166,202,316 | | \$167,419,530 |
| ELAC for Construction | 25% | 41,550,579 | 30% | 50,225,859 |
| Subtotal | | \$207,752,895 | | \$217,645,389 |
| Easements | | -- | | 1,166,170 |
| Total | | \$207,752,895 | | \$218,811,559 |

Table 5-3: Transmission Pipeline Cost Estimate

Other KWA Costs

In prior estimates of the construction cost, KWA used an ELAC of 37%. In this case it could be considered that the engineering effort associated with the design would have been included. However, it is believed that KWA's reduced ELAC of 25%, does not include the design effort. Additionally, it would be prudent to assume that the owner would want a construction manager during construction of this large project. A summary of these costs are shown in Table 5-4.

| Description | Estimate |
|---|---------------------|
| Design Engineering for Pumping Stations and the Transmission Pipeline | \$16,939,581 |
| Construction Management at 5% of Project Cost Estimate of \$217,645,389 | 14,434,609 |
| Administration | 349,440 |
| Legal, Easements, Contract Documents | 831,000 |
| Total | \$32,554,630 |

Table 5-4: Other Costs

Summary Comparison

A summary of the two cost estimates are shown in Table 5-5. Based on the comparison, the estimate performed by TYJT shows a higher cost to Flint by approximately \$25,000,000.

Note that there are two other costs shown in the summary that were not previously addressed; power and backup power. Regarding the cost of providing power to the pumping facilities, the cost of \$4,000,000 appears reasonable.

The KWA has repeatedly indicated that backup power is not needed. Backup power is a standard practice in the water industry. Furthermore, a loss of power at either pumping facility will prevent the supply of water to both Flint and Genesee County. For these reasons, the cost of providing backup power was included in our estimate for the Treasury.

| Description | KWA Estimate | TYJT Estimate |
|--|-----------------------|-----------------------|
| Intake/Crib | \$ 27,596,063 | \$ 27,596,063 |
| Pump Stations | 30,772,600 | 71,042,808 |
| Transmission Mains | 207,752,895 | 217,645,389 |
| Power | 4,000,000 | 4,000,000 |
| Redundant Power for PS | | 1,273,200 |
| Land for Lake Huron Pumping Station | 2,300,000 | 2,300,000 |
| Design Engineering/PS and Transmission | | 16,939,581 |
| Construction Management | | 14,434,410 |
| Administration | | 349,440 |
| Legal/Easement/Contract Documents | | 831,000 |
| Easements | | 1,166,170 |
| Total | \$ 272,421,558 | \$ 357,578,060 |
| Flint Share at 30% | \$81,726,467 | \$107,273,418 |

Table 5-5: Total Cost Comparison

Flint WTP Improvements

The KWA analysis identified capital costs required to convert the existing WTP from river water treatment to treating lake water. The cost estimate was identified as \$7,100,000 in the 2009 report. This number was used in our analysis, since additional information was not provided. For the purpose of the financial analysis; however, the \$7,100,000 was increased by 3% each year for three years to account for inflation.

DWSD Imlay Station Supply Options

The options identified by DWSD to supply service to Flint at the Imlay Pump Station would require Flint to purchase the 72-inch water main from Imlay to Master Meter, FL-1. The pipeline is approximately 25 miles long. The estimated cost provided by DWSD for estimating purposes is \$4,700,000.

Financing

The cost of financing the revenue bonds for the capital work was investigated. Based on conversations with local financial advisors knowledgeable in bond financing, an interest rate of 5% for the 25 year

period was considered acceptable. This is based on a Standard and Poor's bond rating of A without insurance.

Additional costs associated with the bond include the reserve and bond issuance fee. The bond holders will require a reserve of approximately 10% of the loan to be held for the 25 year payment period. The cost associated with the bond issuance has been estimated at 2.25% of the principal borrowed for the KWA project and 3% for the smaller loan associated with the Flint WTP improvements or the purchase of the 72-inch main.

Furthermore, since no revenue will be generated to pay on the bonds for the first three years that the system is being constructed, the cost associated with capitalizing the interest was also included.

Finally, interest on the reserve will be provided back to KWA and Flint. Although the interest is currently less than 1%, it was determined that a 3% rate would be more prudent long-term.

6. FINDINGS

Using the information described in the previous sections, a cost evaluation was conducted for the KWA supply and the DWSD options. Individual worksheets for each option are provided in Appendix B. For the purpose of comparison a 30 year period was used. This period includes the 3 year construction period, the 25 loan period and an additional two years to get a sense of the cost of operation after the loans have been paid.

There were three separate cost sheets prepared for the KWA option. The first cost sheet (KWA) is based on the cost estimate provided by KWA. The costs provided assumed no overruns or delay in construction. With KWA’s own assumptions of an overrun in construction of 15% and a one year delay in operations, the KWA estimated cost becomes \$686,375,920 through Year 2042.

Since this cost estimate did not appear to include the financing of revenue bonds, another cost sheet (KWA-1) was developed that included KWA’s cost estimate without overruns with the additional finance costs associated with the revenue bonds. A final cost sheet (KWA-2) includes the cost associated with the revenue bonds based on the estimate provided by TYJT for the Treasury.

A summary of the cost sheets provided in Appendix B are shown in Table 6-1. Figure 6-1 shows the cumulative annual costs associated with each option.

| Option | Costs through 2042 (\$) | Ranking by Cost |
|---|-------------------------|-----------------|
| DWSD 8 MGD Maximum Day at Imlay Station | 634,795,488 | 1 |
| KWA (10/31/12 No Overruns, As Provided)* | 649,775,166 | 2 |
| DWSD 8 MGD Maximum Day at FL-1 | 672,671,705 | 3 |
| KWA-1 (10/31/12 No Overruns with Cost of Financing) | 707,279,715 | 4 |
| DWSD 12 MGD Maximum Day at Imlay Station | 725,576,803 | 5 |
| DWSD 12 MGD Maximum Day at FL-1 | 762,110,308 | 6 |
| KWA-2 (Treasury Estimate) | 766,784,313 | 7 |
| DWSD 18 MGD Maximum Day at FL-1 | 821,226,268 | 8 |

* \$686,375,920 with 15% overrun in construction and a one year delay in operations

Table 6-1: Total Cost of Options through 2042

Based on the analysis, it is prudent to assume the KWA water supply option costs would be somewhere between the KWA-1 and KWA-2 options. Therefore, the analysis indicates that the two DWSD options of supplying 8 MGD on a maximum day and up to 8 MGD on average are the least cost options for Flint. These options allow Flint to maximize the use of existing assets; the City of Flint’s (the Flint WTP) and DWSD’s (the existing 72-inch main).

Additionally, in recent conversations with the Treasury another option was discussed that could potentially be the most cost-effective solution. Currently the Flint WTP serves as a backup if service is

lost through either the DWSD or KWA pipeline. If the a twin pipe paralleling the DWSD 72-inch water main were constructed with interconnects with the 72-inch line, then the new water main could serve as the backup to Flint and the Flint WTP could be abandoned or potentially sold to Genesee County for their use.

The construction of the parallel pipeline would be considered in the DWSD capital expenditure as a Common to All (CTA) cost. This means that the capital cost of the pipeline would be shared by all DWSD customers and not just by Flint. Preliminary analysis of this option appears to be the most cost-effective of all the options discussed. However, a more thorough cost analysis is warranted and this approach would require an agreement between Flint and DWSD.

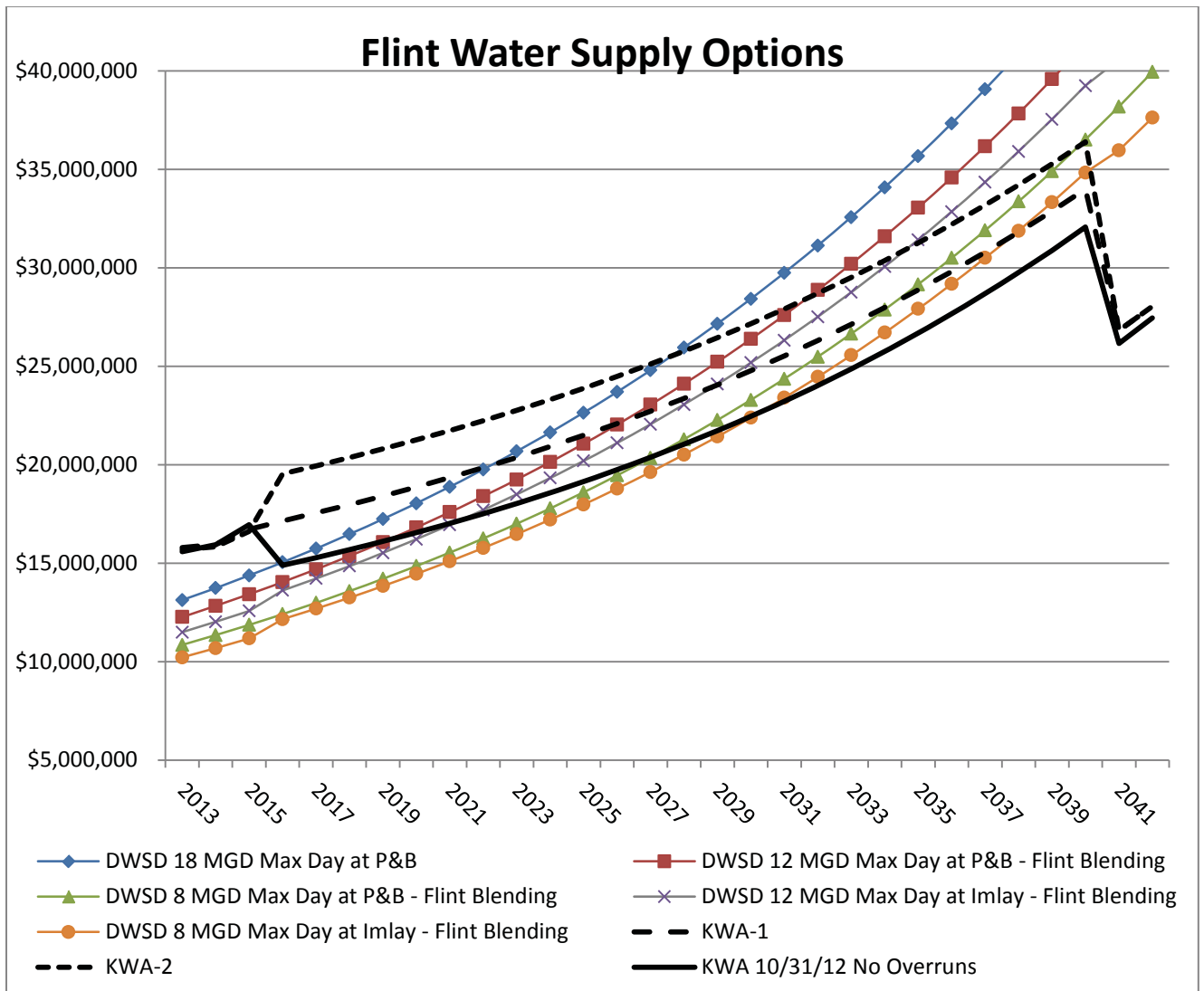


Figure 6-1: Flint Water Supply Options through 2042

7. OTHER CONSIDERATIONS

As part of the investigation other issues were identified that may result in risks to Flint that should be considered by the Treasury in determining how Flint's potable water should be supplied. These issues are related to redundancy and reliability, other items affecting cost, and Flint's desire to control its own destiny related to its water supply. These are described further below.

Redundancy/Reliability

In one of the first meetings related to this task assessment, which was held on November 1, 2012, the Genesee County Drain Commissioner, Mr. Jeff Wright, stated that one of the main reasons for pursuing the KWA supply option related to the lack of reliability of the DWSD system. He pointed to the Northeast blackout of 2003; a widespread power outage that occurred throughout parts of the Northeastern and Midwestern United States and Ontario, Canada, on Thursday, August 14, 2003. He stated that Flint and Genesee County were out of water for several days.

It is worth noting that this was a power outage of historic proportions that affected millions of Americans. However, DWSD did begin supplying water again relatively quickly in comparison to other major cities impacted by the same power outage.

Furthermore, the KWA supply system offers less redundancy to Flint than the current DWSD system. Under both options, Flint is supplied by a single pipeline; however, DWSD has backup power at all of its major facilities supplying Flint. The KWA system will not have a redundant power at its pumping facilities. This would be a major risk.

Currently, backup to the DWSD system for Flint is Flint's WTP using the Flint River as the source of supply. KWA has stated that the Flint River source would also be used as backup to Flint if the KWA supply through its pipeline was lost. However, since the Flint WTP would be upgraded to treat Lake Huron water under the KWA option, using the Flint River as a backup source would require the Flint WTP to maintain two process treatment streams.

In addition to Flint and Genesee County, the DWSD's 72-inch main supplies Imlay City, Mayfield and the Greater Lapeer County Utilities Authority (GLCUA). The volume of water contained within the 72-inch main is approximately 30 MG. Only supplying these three remaining communities would cause the water age to increase dramatically; somewhere in excess of three weeks old, before reaching the customers' master meters. Since the half-life of chlorine in the DWSD system is approximately 5 days, the chlorine would most probably be near zero requiring re-chlorination of the finished water upstream of the master meters.

Re-chlorinating is a costly and risky process due to the instability of chlorine gas. It is unknown whether DWSD would pursue this improvement or possibly abandoned the 72-inch pipeline.

If Flint is supplied by the KWA system, then DWSD supplying their other customers along the 72-inch water main may be reconsidered. Since the KWA system is a raw water supply, the communities would

either have to build a treatment facility to treat the water from KWA or find another water source for their communities.

Additional Cost and Risk Considerations

The design of the KWA supply and the construction of the system have not been completed; therefore, final costs and time to complete are unknown. Cost overruns and delays in completion will both negatively impact Flint's final cost. As example, if the project is not completed within the three year period, payment on the bonds will be due, but the revenue source needed from the sale of water could not be provided.

Furthermore, there is always a risk with large water system construction; especially those including an intake in the Great Lakes, pumping stations and rehabilitation of older water treatment plants. These risks include the potential of explosive gases in tunneling below Lake Huron, changing site conditions associated with the large number of miles of pipe installation and rehabilitating an older WTP, and the startup and debugging of the entire pumping system.

Flint has indicated that they have a high water loss. Not addressing this issue prior to sizing the Flint supply pipeline from KWA could cause the water main to be oversized along with its incremental cost in construction.

Also, the KWA supply option appears to run counter to the Treasury's Competitive Grant Assistance Program (Formerly EVIP Grant). This program has been put in place to allow for communities to consolidate their services and save money. Two existing customers of DWSD (Flint and Genesee County) along with the potential of others customers (GLCUA, Mayfield, Imlay City) separating to from another water system is in contradiction to the program.

Finally, there is a concern over the ability of smaller systems (KWA) over larger systems (DWSD) to pay for future unfunded mandates and regulations. Obviously, identifying regulation requirements over 30 years is hard to determine. However, it is widely accepted that a large system has greater ability to respond to unfunded mandates because the cost can be distributed over a large customer base.

Flint's Autonomy

Flint has indicated that a major point of consideration is that they have no control over the rate increases issued to Flint by DWSD. All other counties supplied by DWSD have representatives on the Board of Water Commissioners (BOWC). The BOWC is one of the governing bodies that approve the water rates. Since Flint and Genesee County do not have a representative on the BOWC, Flint believes they are held "hostage" to DWSD's rates and cost of service.

This issue was stated in Flint's handout at the November 1, 2012 meeting. The handout is titled, "Flint Water Supply Future." However, it is worth noting in the same handout, Flint also identifies similar concerns with the governing board of the KWA system. Notably, that although Flint and Genesee County will be the only customers and Flint will be responsible for 30 percent of the construction cost,

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

STATE OF MICHIGAN CONTRACT NO. 271N3200089
CITY OF FLINT WATER SUPPLY ASSESSMENT

State of Michigan, Department of Treasury

Appendix A: Meeting Minutes

MEETING MINUTES

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%

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:
- Annual water rate for Flint for 2002 through 2012, and the
 - 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.

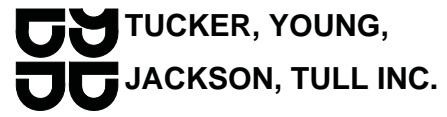
7. Question/Discussion Item: KWA's initial charge to Flint is based on 12 MGD. Is DWSD charge

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

CITY OF FLINT WATER SUPPLY ASSESSMENT

DWSD Discussion/Questions for the November 19, 2012 Meeting

1. Verify that the four options presented at the November 1, 2012 meeting are still available for consideration:
 - c. Supplied from Potter & Baxter using the new model contract (assume a Maximum Day Customer),
 - d. Supplied from Imlay Station,
 - e. Finished un-pumped supply from Lake Huron WTP, and
 - f. Raw un-pumped supply from Lake Huron WTP.
2. What additional capital improvements will be required for each option?
3. Are there other options being presented that should be considered (e.g., blending)?
4. To evaluate each option over the 25 year planning period, provide:
 - g. Annual water rate for Flint for 2002 through 2012, and the
 - h. Projected annual rate adjustment for each option. What are the proposed measures to keep the rate adjustments down in the future?
5. Flint stated a 10% increase in the capacity charge. What number did DWSD provide Flint?
6. Flint financial comparison is based on the initial Cost of \$14,413,858, which includes \$2,725,538 for Flint WTP operating cost, i.e DWSD charge is \$11,688,320. How good is this number?
7. KWA's initial charge to Flint is based on 12 MGD. Is DWSD charge based on 12 MGD?

Comments: Meeting minutes were recorded based on the understanding of the author. Please contact the author within three days if you have any different understanding of the meeting. These minutes will be considered approved unless comments are provided within three days.

Summary of DWSD Cost Allocations to Flint Under Various Scenarios

Flint Only

| | Revenue | 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 Imlay City Connections | 5,800,700 | 170,912 | 9.77 | 15.11 |
| 12 Change | (502,100) | (11,457) | (0.95) | (1.31) |
| 13 % Change | -8.7% | -6.7% | -9.7% | -8.7% |
| 14 Cumulative Change | (5,661,000) | (186,359) | (2.69) | (4.80) |
| 15 Cumulative %Change | -49.4% | -52.2% | -21.6% | -24.1% |

| | Assumptions | | | | | |
|---------------------------------|-------------|-------------|-------------|--------------|-------------|-------------|
| | Avg Day | Max Day | Peak Hour | Distance | Elevation | Sales |
| | <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 Imlay 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 |
| <i>As Charged</i> | | | | | | | |
| 2004 | | 11.06 | 11.06 | | | | |
| 2005 | | 10.24 | 10.24 | | | -7.4% | |
| 2006 | | 10.56 | 10.56 | | | 3.1% | |
| 2007 | | 11.09 | 11.09 | | | 5.0% | |
| 2008 | | 11.35 | 11.35 | | | 2.3% | |
| 2009 | | 13.07 | 13.07 | | | 15.2% | |
| 2010 | | 14.32 | 14.32 | | | 9.6% | |
| 2011 | 182,301 | 14.29 | 16.01 | | -0.2% | 11.8% | |
| 2012 | 443,096 | 13.36 | 17.53 | 143.1% | -6.5% | 9.5% | |
| 2013 | 707,000 | 12.46 | 19.12 | 59.6% | -6.7% | 9.1% | 6.3% |
| <i>Hypothetical Model Contract</i> | | | | | | | |
| 2004 | | 11.06 | 11.06 | | | | |
| 2005 | | 10.24 | 10.24 | | | -7.4% | |
| 2006 | | 10.56 | 10.56 | | | 3.1% | |
| 2007 | | 11.09 | 11.09 | | | 5.0% | |
| 2008 | | 11.35 | 11.35 | | | 2.3% | |
| 2009 | | 13.07 | 13.07 | | | 15.2% | |
| 2010 | | 13.96 | 13.96 | | | 6.8% | |
| 2011 | 145,918 | 13.74 | 15.28 | | -1.6% | 9.5% | |
| 2012 | 378,968 | 12.58 | 16.57 | 159.7% | -8.4% | 8.4% | |
| 2013 | 597,323 | 11.63 | 17.93 | 57.6% | -7.6% | 8.2% | 5.5% |

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 |
| <i>As Charged</i> | | | | | | | |
| 2004 | | 11.06 | 11.06 | | | | |
| 2005 | | 10.24 | 10.24 | | | -7.4% | |
| 2006 | | 10.56 | 10.56 | | | 3.1% | |
| 2007 | | 11.09 | 11.09 | | | 5.0% | |
| 2008 | | 11.35 | 11.35 | | | 2.3% | |
| 2009 | | 13.07 | 13.07 | | | 15.2% | |
| 2010 | | 14.32 | 14.32 | | | 9.6% | |
| 2011 | 182,301 | 14.29 | 16.01 | | -0.2% | 11.8% | |
| 2012 | 443,096 | 13.36 | 17.53 | 143.1% | -6.5% | 9.5% | |
| 2013 | 707,000 | 12.46 | 19.12 | 59.6% | -6.7% | 9.1% | 6.3% |
| <i>Hypothetical Model Contract - Flint Only</i> | | | | | | | |
| 2004 | | 11.06 | 11.06 | | | | |
| 2005 | | 10.24 | 10.24 | | | -7.4% | |
| 2006 | | 10.56 | 10.56 | | | 3.1% | |
| 2007 | | 11.09 | 11.09 | | | 5.0% | |
| 2008 | | 11.35 | 11.35 | | | 2.3% | |
| 2009 | | 13.07 | 13.07 | | | 15.2% | |
| 2010 | | 11.73 | 11.73 | | | -10.3% | |
| 2011 | 70,060 | 12.45 | 13.89 | | 6.1% | 18.4% | |
| 2012 | 175,882 | 11.47 | 15.08 | 151.0% | -7.9% | 8.6% | |
| 2013 | 272,923 | 10.65 | 16.24 | 55.2% | -7.1% | 7.7% | 4.4% |

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 |
| <i>As Charged</i> | | | | | | | |
| 2004 | | 11.06 | 11.06 | | | | |
| 2005 | | 10.24 | 10.24 | | | -7.4% | |
| 2006 | | 10.56 | 10.56 | | | 3.1% | |
| 2007 | | 11.09 | 11.09 | | | 5.0% | |
| 2008 | | 11.35 | 11.35 | | | 2.3% | |
| 2009 | | 13.07 | 13.07 | | | 15.2% | |
| 2010 | | 14.32 | 14.32 | | | 9.6% | |
| 2011 | 182,301 | 14.29 | 16.01 | | -0.2% | 11.8% | |
| 2012 | 443,096 | 13.36 | 17.53 | 143.1% | -6.5% | 9.5% | |
| 2013 | 707,000 | 12.46 | 19.12 | 59.6% | -6.7% | 9.1% | 6.3% |
| <i>Hypothetical Model Contract - Flint Only @ Imlay</i> | | | | | | | |
| 2004 | | 11.06 | 11.06 | | | | |
| 2005 | | 10.24 | 10.24 | | | -7.4% | |
| 2006 | | 10.56 | 10.56 | | | 3.1% | |
| 2007 | | 11.09 | 11.09 | | | 5.0% | |
| 2008 | | 11.35 | 11.35 | | | 2.3% | |
| 2009 | | 13.07 | 13.07 | | | 15.2% | |
| 2010 | | 11.16 | 11.16 | | | -14.6% | |
| 2011 | 65,919 | 10.88 | 12.23 | | -2.5% | 9.6% | |
| 2012 | 165,275 | 9.89 | 13.28 | 150.7% | -9.1% | 8.6% | |
| 2013 | 255,580 | 9.09 | 14.32 | 54.6% | -8.1% | 7.8% | 2.9% |

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.

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| Action Items for Follow-up | | |
|---|---------------------|-------------------------|
| Items: | Assigned To: | Date to Complete |
| 1. Updated Costs for the Flint WTP Improvements and a description of the improvements. | John O'Brien | 11/21/12 |
| 2. KWA Operating Agreement, Capacity Contract and Articles of Incorporation. | John O'Brien | 11/20/12 |
| 3. Provide the last 10 years of audited financial statements for the Genesee water fund. | John O'Brien | 11/20/12 |
| 4. Provide multiple years of financial statements for the City of Flint water fund. | Duffy Johnson | 11/26/12 |
| 5. Provide schematic of the Flint WTP and a map of the Flint transmission system. | Brent Wright | 11/26/12 |
| 6. Provide the length of the intake pipe from the crib to the pump station. | John O'Brien | 11/20/12 |
| 7. Provide a list of assumptions that the \$272 million cost estimate is based on since the route is now known. | John O'Brien | 11/26/12 |

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.

**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.

-
- 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

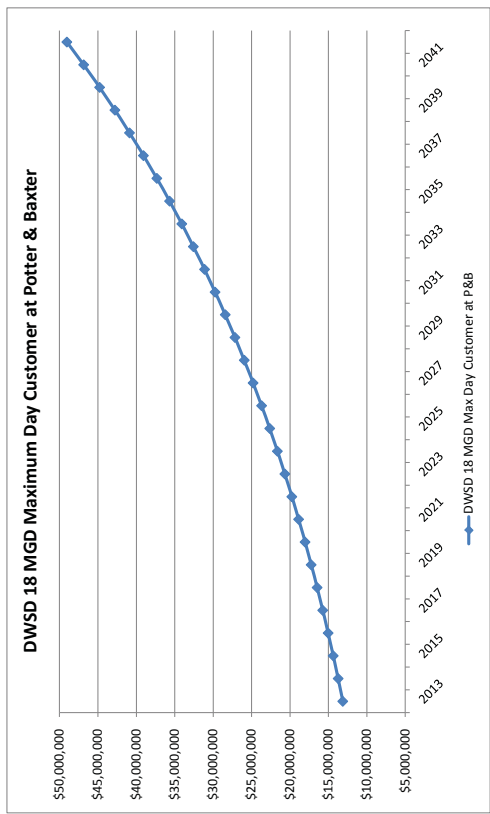
Appendix B: Cost Worksheets

DWSD Worksheet : 18 MGD Maximum Day Customer with Model Contract at Potter & Baxter

| | | |
|----------------------------------|----------------------------|---------------------|
| Capacity | Flint ADD: 0.60 MGD | 81 MCF/Day |
| | DWSD ADD: 12 MGD | 1,604 MCF/Day |
| Annual Volume | Flint: 29,412 MCF | |
| | DWSD: 585,561 MCF | |
| 2013 Cost of Supply | Flint WTP O&M: 120.30 /MCF | \$ 3,538,214 /Yr |
| | DWSD: 16.37 /MCF | \$ 9,585,642 /Yr |
| Escalation/Inflation Rate | Flint: 4.51% /Yr | |
| | DWSD: 4.7% /Yr | |
| Capital Expenditure | Amount: \$ - | Reserve Rate: 0.00% |
| | Reserve: \$ - | |
| | Amount plus Reserve: \$ - | |
| | Revenue Bond Rate: 5% | |
| | Number of Years: 25 | |
| | Annual Cost: \$0 | |

| Year | Flint WTP O&M | Water Purchase | Revenue Bond Payment | Interest on Reserve | TOTAL |
|------|-----------------------|--------------------------|----------------------|---------------------|-----------------------|
| 2013 | \$ 3,538,214 | 9,585,642 | - | - | \$ 13,123,856 |
| 2014 | \$ 3,697,788 | 10,036,167 | - | - | \$ 13,733,955 |
| 2015 | \$ 3,864,558 | 10,507,867 | - | - | \$ 14,372,425 |
| 2016 | \$ 4,038,850 | 11,001,736 | - | - | \$ 15,040,586 |
| 2017 | \$ 4,221,002 | 11,518,818 | - | - | \$ 15,739,820 |
| 2018 | \$ 4,411,369 | 12,060,203 | - | - | \$ 16,471,571 |
| 2019 | \$ 4,610,322 | 12,627,032 | - | - | \$ 17,237,354 |
| 2020 | \$ 4,818,247 | 13,220,503 | - | - | \$ 18,038,750 |
| 2021 | \$ 5,035,550 | 13,841,866 | - | - | \$ 18,877,416 |
| 2022 | \$ 5,262,653 | 14,492,434 | - | - | \$ 19,755,087 |
| 2023 | \$ 5,499,999 | 15,173,578 | - | - | \$ 20,673,577 |
| 2024 | \$ 5,748,049 | 15,886,736 | - | - | \$ 21,634,785 |
| 2025 | \$ 6,007,286 | 16,633,413 | - | - | \$ 22,640,699 |
| 2026 | \$ 6,278,215 | 17,415,183 | - | - | \$ 23,693,398 |
| 2027 | \$ 6,561,362 | 18,233,697 | - | - | \$ 24,795,059 |
| 2028 | \$ 6,857,279 | 19,090,681 | - | - | \$ 25,947,960 |
| 2029 | \$ 7,166,543 | 19,987,943 | - | - | \$ 27,154,486 |
| 2030 | \$ 7,489,754 | 20,927,376 | - | - | \$ 28,417,130 |
| 2031 | \$ 7,827,542 | 21,910,963 | - | - | \$ 29,738,505 |
| 2032 | \$ 8,180,564 | 22,940,778 | - | - | \$ 31,121,342 |
| 2033 | \$ 8,549,507 | 24,018,995 | - | - | \$ 32,568,502 |
| 2034 | \$ 8,935,090 | 25,147,887 | - | - | \$ 34,082,977 |
| 2035 | \$ 9,338,063 | 26,329,838 | - | - | \$ 35,667,901 |
| 2036 | \$ 9,759,209 | 27,567,341 | - | - | \$ 37,326,550 |
| 2037 | \$ 10,199,350 | 28,863,006 | - | - | \$ 39,062,355 |
| 2038 | \$ 10,659,340 | 30,219,567 | - | - | \$ 40,878,907 |
| 2039 | \$ 11,140,076 | 31,639,886 | - | - | \$ 42,779,963 |
| 2040 | \$ 11,642,494 | 33,126,961 | - | - | \$ 44,769,455 |
| 2041 | \$ 12,167,570 | 34,683,928 | - | - | \$ 46,851,499 |
| 2042 | \$ 12,716,328 | 36,314,073 | - | - | \$ 49,030,401 |
| | \$ 216,222,171 | | | | |
| | \$ | 25 Yrs Cumulative | | | \$ 596,916,044 |

| | |
|-----------|--------------------------|
| \$ | 30 Yrs Cumulative |
| \$ | 821,226,268 |



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

Capacity: Flint ADD: 4 MGD 535 MCF/Day
 DWSD ADD: 8 MGD 1,070 MCF/Day
 Annual Volume: Flint: 195,187 MCF
 DWSD: 390,374 MCF
 2013 Cost of Supply: Flint WTP O&M: \$ 30.20 /MCF \$ 5,895,097 /Yr
 DWSD: \$ 16.31 /MCF \$ 6,367,005 /Yr

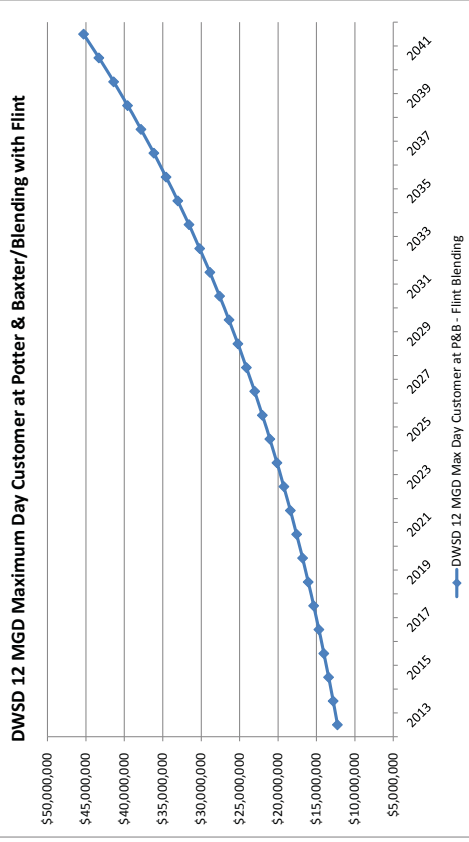
Escalation/Inflation Rate: Flint: 4.51% /Yr
 DWSD: 4.7% /Yr

Capital Expenditure: Amount: \$ - Reserve Rate: 0.00%
 Reserve: \$ -
 Amount plus Reserve: \$ -
 Revenue Bond Rate: 5%
 Number of Years: 25
 Annual Cost: \$0

| Year | Flint WTP O&M | Water Purchase | Revenue Bond Payment | Interest on Reserve | TOTAL |
|------|---------------|----------------|----------------------|---------------------|---------------|
| 2013 | \$ 5,895,097 | 6,367,005 | - | - | \$ 12,262,103 |
| 2014 | \$ 6,160,966 | 6,666,255 | - | - | \$ 12,827,221 |
| 2015 | \$ 6,438,826 | 6,979,569 | - | - | \$ 13,418,395 |
| 2016 | \$ 6,729,217 | 7,307,608 | - | - | \$ 14,036,825 |
| 2017 | \$ 7,032,705 | 7,651,066 | - | - | \$ 14,683,771 |
| 2018 | \$ 7,349,880 | 8,010,666 | - | - | \$ 15,360,546 |
| 2019 | \$ 7,681,359 | 8,387,167 | - | - | \$ 16,068,527 |
| 2020 | \$ 8,027,789 | 8,781,364 | - | - | \$ 16,809,153 |
| 2021 | \$ 8,389,842 | 9,194,088 | - | - | \$ 17,583,930 |
| 2022 | \$ 8,768,224 | 9,626,210 | - | - | \$ 18,394,434 |
| 2023 | \$ 9,163,671 | 10,078,642 | - | - | \$ 19,242,313 |
| 2024 | \$ 9,576,952 | 10,552,338 | - | - | \$ 20,129,291 |
| 2025 | \$ 10,008,873 | 11,048,298 | - | - | \$ 21,057,171 |
| 2026 | \$ 10,460,273 | 11,567,568 | - | - | \$ 22,027,841 |
| 2027 | \$ 10,932,031 | 12,111,244 | - | - | \$ 23,043,275 |
| 2028 | \$ 11,425,066 | 12,680,473 | - | - | \$ 24,105,538 |
| 2029 | \$ 11,940,336 | 13,276,455 | - | - | \$ 25,216,791 |
| 2030 | \$ 12,478,845 | 13,900,448 | - | - | \$ 26,379,294 |
| 2031 | \$ 13,041,641 | 14,553,769 | - | - | \$ 27,595,410 |
| 2032 | \$ 13,629,819 | 15,237,796 | - | - | \$ 28,867,616 |
| 2033 | \$ 14,244,524 | 15,953,973 | - | - | \$ 30,198,497 |
| 2034 | \$ 14,886,952 | 16,703,810 | - | - | \$ 31,590,762 |
| 2035 | \$ 15,558,354 | 17,488,889 | - | - | \$ 33,047,242 |
| 2036 | \$ 16,260,035 | 18,310,866 | - | - | \$ 34,570,902 |
| 2037 | \$ 16,993,363 | 19,171,477 | - | - | \$ 36,164,840 |
| 2038 | \$ 17,759,764 | 20,072,537 | - | - | \$ 37,832,300 |
| 2039 | \$ 18,560,729 | 21,015,946 | - | - | \$ 39,576,675 |
| 2040 | \$ 19,397,818 | 22,003,695 | - | - | \$ 41,401,513 |
| 2041 | \$ 20,272,660 | 23,037,869 | - | - | \$ 43,310,528 |
| 2042 | \$ 21,186,956 | 24,120,649 | - | - | \$ 45,307,605 |

25 Yrs Cumulative \$ 554,681,686

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: 535 MCF/Day
 DWSD ADD: 1,070 MCF/Day
 Annual Volume: Flint: 195,187 MCF
 DWSD: 390,374 MCF

2013 Cost of Supply
 Flint WTP O&M: \$ 30.20 /MCF \$ 5,895,097 /Yr
 DWSD: \$ 12.68 /MCF \$ 4,949,947 /Yr

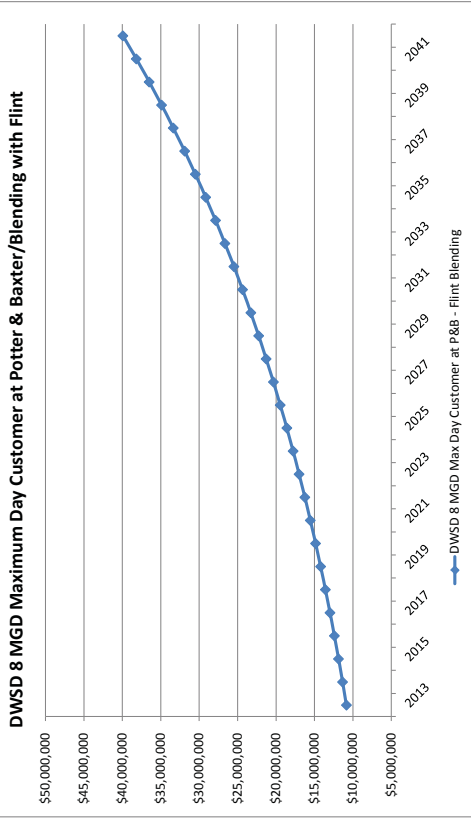
Escalation/Inflation Rate
 Flint: 4.51% /Yr
 DWSD: 4.7% /Yr

Capital Expenditure
 Amount: \$ - Reserve Rate: 0.00%
 Reserve: \$ -
 Amount plus Reserve: \$ -
 Revenue Bond Rate: 5%
 Number of Years: 25
 Annual Cost: \$0

| Year | Flint WTP O&M | Water Purchase | Bond Payment | Interest on Reserve | TOTAL |
|------|---------------|----------------|--------------|---------------------|---------------|
| 2013 | \$ 5,895,097 | 4,949,947 | - | - | \$ 10,845,044 |
| 2014 | \$ 6,160,966 | 5,182,594 | - | - | \$ 11,343,560 |
| 2015 | \$ 6,438,826 | 5,426,176 | - | - | \$ 11,865,002 |
| 2016 | \$ 6,729,217 | 5,681,206 | - | - | \$ 12,410,423 |
| 2017 | \$ 7,032,705 | 5,948,223 | - | - | \$ 12,980,928 |
| 2018 | \$ 7,349,880 | 6,227,789 | - | - | \$ 13,577,669 |
| 2019 | \$ 7,681,359 | 6,520,495 | - | - | \$ 14,201,855 |
| 2020 | \$ 8,027,789 | 6,826,959 | - | - | \$ 14,854,747 |
| 2021 | \$ 8,389,842 | 7,147,826 | - | - | \$ 15,537,668 |
| 2022 | \$ 8,768,224 | 7,483,774 | - | - | \$ 16,251,997 |
| 2023 | \$ 9,163,671 | 7,835,511 | - | - | \$ 16,999,182 |
| 2024 | \$ 9,576,952 | 8,203,780 | - | - | \$ 17,780,732 |
| 2025 | \$ 10,008,873 | 8,589,358 | - | - | \$ 18,598,230 |
| 2026 | \$ 10,460,273 | 8,993,057 | - | - | \$ 19,453,330 |
| 2027 | \$ 10,932,031 | 9,415,731 | - | - | \$ 20,347,762 |
| 2028 | \$ 11,425,066 | 9,858,271 | - | - | \$ 21,283,336 |
| 2029 | \$ 11,940,336 | 10,321,609 | - | - | \$ 22,261,945 |
| 2030 | \$ 12,478,845 | 10,806,725 | - | - | \$ 23,285,570 |
| 2031 | \$ 13,041,641 | 11,314,641 | - | - | \$ 24,356,282 |
| 2032 | \$ 13,629,819 | 11,846,429 | - | - | \$ 25,476,248 |
| 2033 | \$ 14,244,524 | 12,403,211 | - | - | \$ 26,647,735 |
| 2034 | \$ 14,886,952 | 12,986,162 | - | - | \$ 27,873,114 |
| 2035 | \$ 15,558,354 | 13,596,512 | - | - | \$ 29,154,866 |
| 2036 | \$ 16,260,035 | 14,235,548 | - | - | \$ 30,495,583 |
| 2037 | \$ 16,993,363 | 14,904,619 | - | - | \$ 31,897,982 |
| 2038 | \$ 17,759,764 | 15,605,136 | - | - | \$ 33,364,899 |
| 2039 | \$ 18,560,729 | 16,338,577 | - | - | \$ 34,899,306 |
| 2040 | \$ 19,397,818 | 17,106,490 | - | - | \$ 36,504,308 |
| 2041 | \$ 20,272,660 | 17,910,495 | - | - | \$ 38,183,155 |
| 2042 | \$ 21,186,956 | 18,752,288 | - | - | \$ 39,939,245 |

25 Yrs Cumulative
 \$ 489,780,792

30 Yrs Cumulative
 \$ 672,671,705



DWSD Worksheet : 12 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

Capacity
 Flint ADD: 4 MGD 535 MCF/Day
 DWSD ADD: 8 MGD 1,070 MCF/Day

Annual Volume
 Flint: 195,187 MCF
 DWSD: 390,374 MCF

2013 Cost of Supply
 Flint WTP O&M: \$ 30.20 /MCF \$ 5,895,097 /Yr
 DWSD: \$ 14.38 /MCF \$ 5,613,583 /Yr

Escalation/Inflation Rate
 Flint: 4.51% /Yr
 DWSD: 4.7% /Yr

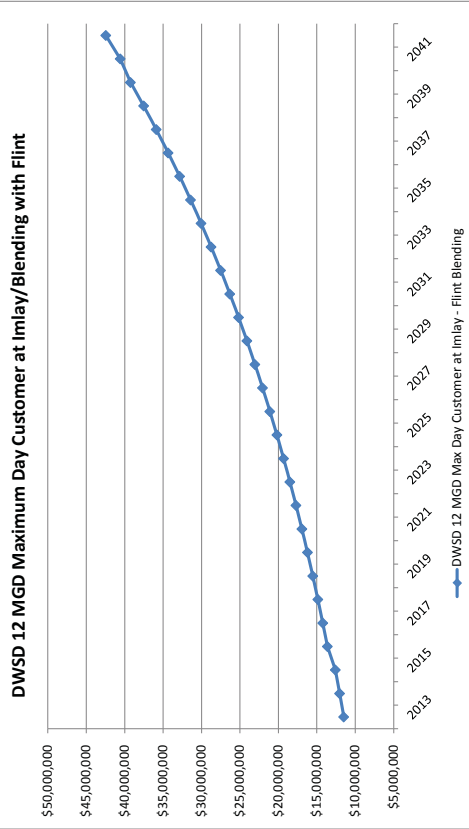
Capital Expenditure
 Capital: \$ 4,700,000
 Bond Issuance (3% of Total): 195,000
 3 Years of Capitalized Interest: 975,000
 Reserve (10% of Total): 650,000
 Total: \$ 6,520,000

Revenue Bond Rate: 5%
 Number of Years: 25
 Annual Cost: \$462,610
 Interest on Reserve: 3%

| Year | Flint WTP O&M | Water Purchase | Revenue Bond Payment | Interest on Reserve | TOTAL |
|------|---------------|----------------|----------------------|---------------------|-------|
| 2013 | \$ 5,895,097 | 5,613,583 | 19,500 | \$ 11,489,180 | |
| 2014 | \$ 6,160,966 | 5,877,421 | 19,500 | \$ 12,018,888 | |
| 2015 | \$ 6,438,826 | 6,153,660 | 19,500 | \$ 12,572,986 | |
| 2016 | \$ 6,729,217 | 6,442,882 | 462,610 | \$ 13,615,209 | |
| 2017 | \$ 7,032,705 | 6,745,698 | 462,610 | \$ 14,221,512 | |
| 2018 | \$ 7,349,880 | 7,062,745 | 462,610 | \$ 14,855,735 | |
| 2019 | \$ 7,681,359 | 7,394,694 | 462,610 | \$ 15,519,164 | |
| 2020 | \$ 8,027,789 | 7,742,245 | 462,610 | \$ 16,213,144 | |
| 2021 | \$ 8,389,842 | 8,106,131 | 462,610 | \$ 16,939,082 | |
| 2022 | \$ 8,768,224 | 8,487,119 | 462,610 | \$ 17,698,452 | |
| 2023 | \$ 9,163,671 | 8,886,013 | 462,610 | \$ 18,492,794 | |
| 2024 | \$ 9,576,952 | 9,303,656 | 462,610 | \$ 19,323,718 | |
| 2025 | \$ 10,008,873 | 9,740,928 | 462,610 | \$ 20,192,910 | |
| 2026 | \$ 10,460,273 | 10,198,751 | 462,610 | \$ 21,102,134 | |
| 2027 | \$ 10,932,031 | 10,678,093 | 462,610 | \$ 22,053,234 | |
| 2028 | \$ 11,425,066 | 11,179,963 | 462,610 | \$ 23,048,139 | |
| 2029 | \$ 11,940,336 | 11,705,421 | 462,610 | \$ 24,088,867 | |
| 2030 | \$ 12,478,845 | 12,255,576 | 462,610 | \$ 25,177,531 | |
| 2031 | \$ 13,041,641 | 12,831,588 | 462,610 | \$ 26,316,339 | |
| 2032 | \$ 13,629,819 | 13,434,673 | 462,610 | \$ 27,507,602 | |
| 2033 | \$ 14,244,524 | 14,066,102 | 462,610 | \$ 28,753,736 | |
| 2034 | \$ 14,886,952 | 14,727,209 | 462,610 | \$ 30,057,271 | |
| 2035 | \$ 15,558,354 | 15,419,388 | 462,610 | \$ 31,420,852 | |
| 2036 | \$ 16,260,035 | 16,144,099 | 462,610 | \$ 32,847,245 | |
| 2037 | \$ 16,993,363 | 16,902,872 | 462,610 | \$ 34,339,345 | |
| 2038 | \$ 17,759,764 | 17,697,307 | 462,610 | \$ 35,900,181 | |
| 2039 | \$ 18,560,729 | 18,529,080 | 462,610 | \$ 37,532,919 | |
| 2040 | \$ 19,397,818 | 19,399,947 | 462,610 | \$ 39,240,875 | |
| 2041 | \$ 20,272,660 | 20,311,745 | 462,610 | \$ 40,584,404 | |
| 2042 | \$ 21,186,956 | 21,266,397 | | \$ 42,453,353 | |

25 Yrs Cumulative
 \$ 529,865,071

30 Yrs Cumulative
 \$ 725,576,803



DWSD Worksheet : 8 MGD Maximum Day Customer with Model Contract at Imlay/Blending with Flint

Capacity Flint ADD: 4 MGD 535 MCF/Day
 DWSD ADD: 8 MGD 1,070 MCF/Day

Annual Volume Flint: 195,187 MCF
 DWSD: 390,374 MCF

2013 Cost of Supply Flint WTP O&M: \$ 30.20 /MCF \$ 5,895,097 /Yr
 DWSD: \$ 11.11 /MCF \$ 4,337,059 /Yr

Escalation/Inflation Rate Flint: 4.51% /Yr
 DWSD: 4.7% /Yr

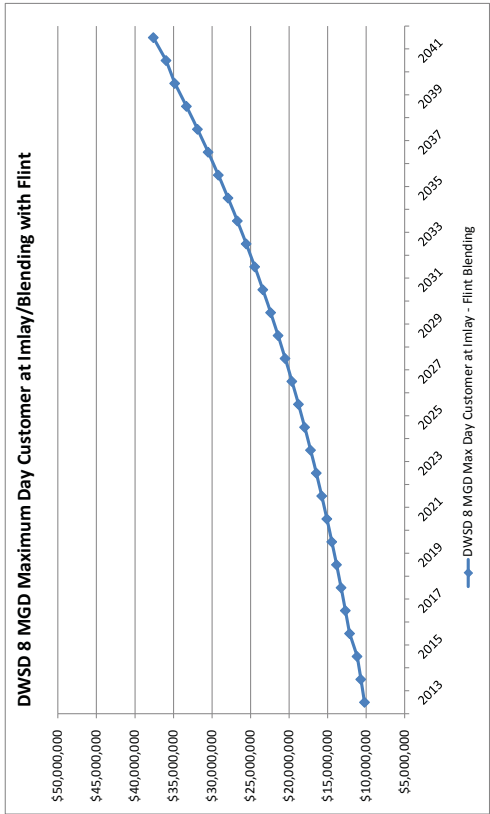
Capital Expenditure Capital: \$ 4,700,000
 Bond Issuance (3% of Total): 195,000
 3 Years of Capitalized Interest: 975,000
 Reserve (10% of Total): 650,000
 Total: \$ 6,520,000

Revenue Bond Rate: 5%
 Number of Years: 25
 Annual Cost: \$462,610
 Interest on Reserve: 3%

| Year | Flint WTP O&M | Water Purchase | Bond Payment | Interest on Reserve | TOTAL |
|------|---------------|----------------|--------------|---------------------|---------------|
| 2013 | \$ 5,895,097 | 4,337,059 | 19,500 | 19,500 | \$ 10,212,656 |
| 2014 | \$ 6,160,966 | 4,337,059 | 19,500 | 19,500 | \$ 10,682,367 |
| 2015 | \$ 6,438,826 | 4,754,323 | 19,500 | 19,500 | \$ 11,173,649 |
| 2016 | \$ 6,729,217 | 4,977,776 | 462,610 | 19,500 | \$ 12,150,103 |
| 2017 | \$ 7,032,705 | 5,211,732 | 462,610 | 19,500 | \$ 12,687,546 |
| 2018 | \$ 7,349,880 | 5,456,683 | 462,610 | 19,500 | \$ 13,249,673 |
| 2019 | \$ 7,681,359 | 5,713,147 | 462,610 | 19,500 | \$ 13,837,616 |
| 2020 | \$ 8,027,789 | 5,981,665 | 462,610 | 19,500 | \$ 14,452,564 |
| 2021 | \$ 8,389,842 | 6,262,803 | 462,610 | 19,500 | \$ 15,095,755 |
| 2022 | \$ 8,768,224 | 6,557,155 | 462,610 | 19,500 | \$ 15,768,489 |
| 2023 | \$ 9,163,671 | 6,865,341 | 462,610 | 19,500 | \$ 16,472,122 |
| 2024 | \$ 9,576,952 | 7,188,012 | 462,610 | 19,500 | \$ 17,208,074 |
| 2025 | \$ 10,008,873 | 7,525,849 | 462,610 | 19,500 | \$ 17,977,832 |
| 2026 | \$ 10,460,273 | 7,879,564 | 462,610 | 19,500 | \$ 18,782,947 |
| 2027 | \$ 10,932,031 | 8,249,903 | 462,610 | 19,500 | \$ 19,625,044 |
| 2028 | \$ 11,425,066 | 8,637,649 | 462,610 | 19,500 | \$ 20,505,824 |
| 2029 | \$ 11,940,336 | 9,043,618 | 462,610 | 19,500 | \$ 21,427,064 |
| 2030 | \$ 12,478,845 | 9,468,668 | 462,610 | 19,500 | \$ 22,390,624 |
| 2031 | \$ 13,041,641 | 9,913,696 | 462,610 | 19,500 | \$ 23,398,447 |
| 2032 | \$ 13,629,819 | 10,379,639 | 462,610 | 19,500 | \$ 24,452,569 |
| 2033 | \$ 14,244,524 | 10,867,482 | 462,610 | 19,500 | \$ 25,555,117 |
| 2034 | \$ 14,886,952 | 11,378,254 | 462,610 | 19,500 | \$ 26,708,316 |
| 2035 | \$ 15,558,354 | 11,913,032 | 462,610 | 19,500 | \$ 27,914,496 |
| 2036 | \$ 16,260,035 | 12,472,945 | 462,610 | 19,500 | \$ 29,176,090 |
| 2037 | \$ 16,993,363 | 13,059,173 | 462,610 | 19,500 | \$ 30,495,646 |
| 2038 | \$ 17,759,764 | 13,672,954 | 462,610 | 19,500 | \$ 31,875,828 |
| 2039 | \$ 18,560,729 | 14,315,583 | 462,610 | 19,500 | \$ 33,319,422 |
| 2040 | \$ 19,397,818 | 14,988,415 | 462,610 | 19,500 | \$ 34,829,343 |
| 2041 | \$ 20,272,660 | 15,692,871 | 462,610 | 19,500 | \$ 35,965,530 |
| 2042 | \$ 21,186,956 | 16,430,436 | 462,610 | 19,500 | \$ 37,617,392 |

\$ 25 Yrs Cumulative 493,063,801

\$ 30 Yrs Cumulative 634,795,488

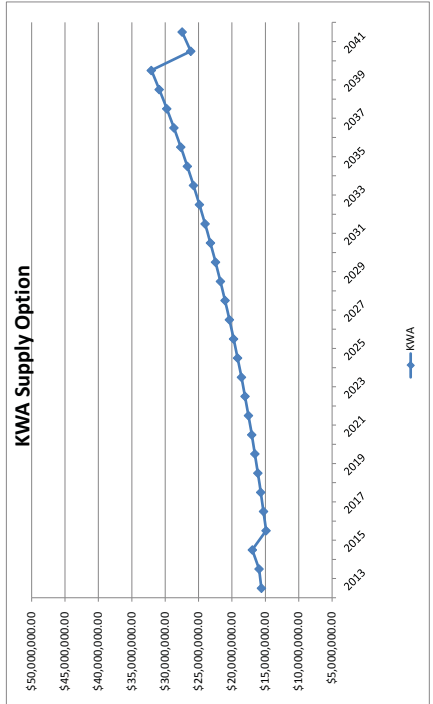


KWA Supply Option Worksheet
KWA.10/31/12 No Overruns

| Year | DWSD & Flint WTP Costs | KWA Entry Fee | KWA Debt service | Flint WTP Debt Service | KWA Operation \$ | Flint WTP Operations with KWA | TOTAL |
|------|------------------------|---------------|------------------|------------------------|------------------|-------------------------------|---------------|
| 1 | 2013 | \$ 1,162,800 | 6,593,155 | 572,781 | 878,869 | 6,893,344 | \$ 15,576,658 |
| 2 | 2014 | \$ 14,413,858 | 6,593,155 | 572,781 | 922,812 | 7,185,511 | \$ 15,936,535 |
| 3 | 2015 | \$ 15,355,135 | 6,593,155 | 572,781 | 968,953 | 7,547,877 | \$ 16,946,934 |
| 4 | 2016 | \$ 16,365,534 | 6,593,155 | 572,781 | 1,017,401 | 7,922,026 | \$ 18,888,149 |
| 5 | 2017 | | 6,593,155 | 572,781 | 1,068,271 | 8,338,127 | \$ 15,679,676 |
| 6 | 2018 | \$ 1,162,800 | 6,593,155 | 572,781 | 1,121,684 | 8,734,034 | \$ 16,552,334 |
| 7 | 2019 | \$ 15,355,135 | 6,593,155 | 572,781 | 1,177,769 | 9,170,735 | \$ 17,021,654 |
| 8 | 2020 | \$ 16,365,534 | 6,593,155 | 572,781 | 1,236,657 | 9,629,272 | \$ 18,031,865 |
| 9 | 2021 | | 6,593,155 | 572,781 | 1,298,490 | 10,110,736 | \$ 18,575,162 |
| 10 | 2022 | \$ 1,162,800 | 6,593,155 | 572,781 | 1,363,414 | 10,616,273 | \$ 19,445,623 |
| 11 | 2023 | \$ 15,355,135 | 6,593,155 | 572,781 | 1,431,585 | 11,147,086 | \$ 19,744,607 |
| 12 | 2024 | \$ 16,365,534 | 6,593,155 | 572,781 | 1,503,164 | 11,704,441 | \$ 20,373,541 |
| 13 | 2025 | | 6,593,155 | 572,781 | 1,578,322 | 12,289,663 | \$ 21,033,921 |
| 14 | 2026 | \$ 1,162,800 | 6,593,155 | 572,781 | 1,657,239 | 12,904,146 | \$ 21,727,320 |
| 15 | 2027 | \$ 15,355,135 | 6,593,155 | 572,781 | 1,740,101 | 13,549,353 | \$ 22,455,390 |
| 16 | 2028 | \$ 16,365,534 | 6,593,155 | 572,781 | 1,827,106 | 14,226,821 | \$ 23,219,862 |
| 17 | 2029 | | 6,593,155 | 572,781 | 1,918,461 | 14,938,162 | \$ 24,022,559 |
| 18 | 2030 | \$ 1,162,800 | 6,593,155 | 572,781 | 2,014,384 | 15,685,070 | \$ 24,865,390 |
| 19 | 2031 | \$ 15,355,135 | 6,593,155 | 572,781 | 2,115,103 | 16,469,323 | \$ 25,750,362 |
| 20 | 2032 | \$ 16,365,534 | 6,593,155 | 572,781 | 2,220,858 | 17,292,789 | \$ 26,679,584 |
| 21 | 2033 | | 6,593,155 | 572,781 | 2,331,901 | 18,157,429 | \$ 27,655,266 |
| 22 | 2034 | \$ 1,162,800 | 6,593,155 | 572,781 | 2,448,496 | 19,065,300 | \$ 28,679,733 |
| 23 | 2035 | \$ 15,355,135 | 6,593,155 | 572,781 | 2,570,921 | 20,018,565 | \$ 29,755,422 |
| 24 | 2036 | \$ 16,365,534 | 6,593,155 | 572,781 | 2,699,467 | 21,019,494 | \$ 30,884,897 |
| 25 | 2037 | | 6,593,155 | 572,781 | 2,834,440 | 22,070,468 | \$ 32,070,805 |
| 26 | 2038 | \$ 1,162,800 | 6,593,155 | 572,781 | 2,976,162 | 23,173,992 | \$ 26,150,154 |
| 27 | 2039 | \$ 15,355,135 | 6,593,155 | 572,781 | 3,124,970 | 24,332,691 | \$ 27,457,662 |
| 28 | 2040 | \$ 16,365,534 | 6,593,155 | 572,781 | | | |
| 29 | 2041 | | 6,593,155 | 572,781 | | | |
| 30 | 2042 | | 6,593,155 | 572,781 | | | |

\$ 25 Yrs Cumulative
503,456,186

\$ 30 Yrs Cumulative
649,775,166



KWA Supply Option Worksheet
KWA-1

Capacity: Flint ADD: 13 MGD 1,604 MCF/Day
KWA ADD: 13 MGD 1,604 MCF/Day

Annual Volume: Flint: 585,561 MCF
KWA: 585,561 MCF

2016 Cost of Supply: Flint WTP O&M: \$ 7,913,118 /Yr
KWA: \$ 878,869 /Yr

Escalation/Inflation Rate: Flint: 4.51% /Yr
KWA: 5.0% /Yr

Capital Expenditure: Capital: \$ 272,421,558
Bonds Issuance (2.25% of Total): 8,440,000
3 Years of Capitalized Interest: 56,000,000
Reserve (10% of Total): 37,500,000
Total: \$ 374,361,558

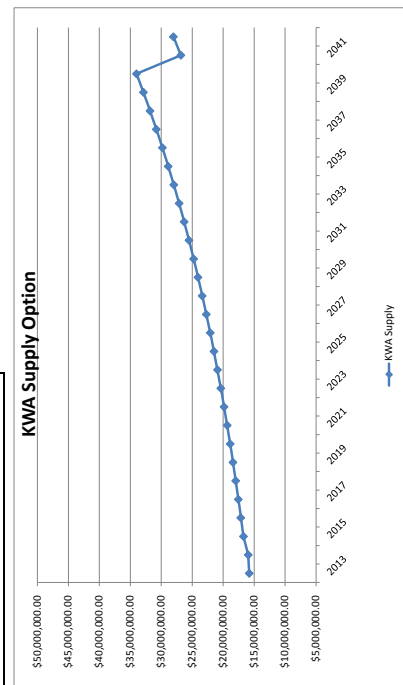
Revenue Bond Rate: 5%
Number of Years: 25
Annual Cost: \$7,968,562
Interest on Reserve: 3%

Flint's Share (30%): \$ 112,308,467
Revenue Bond Rate: 5%
Number of Years: 25
Annual Cost: \$7,968,562
Interest on Reserve: 3%

Flint's Share (30%): \$ 112,308,467
Revenue Bond Rate: 5%
Number of Years: 25
Annual Cost: \$7,968,562
Interest on Reserve: 3%

Revenue Bond Rate: 5%
Number of Years: 25
Annual Cost: \$7,968,562
Interest on Reserve: 3%

Revenue Bond Rate: 5%
Number of Years: 25
Annual Cost: \$7,968,562
Interest on Reserve: 3%



David Gustella: Flint buys water from DWSD for three years during KWA construction at current rate (assumes 5% increase each year)

David Gustella: Highlighted portion is Flint's Entry Fee to KWA

| Year | Flint WTP O&M | Water Purchase | KWA Revenue Pre-bond Entry Fee & Bond Payment | Flint Revenue Bond Payment | Interest on Reserve | TOTAL |
|------|---------------|----------------|---|----------------------------|---------------------|---------------|
| 2013 | \$ 3,528,214 | 11,461,702 | 1,162,809 | | 369,600 | \$ 15,783,114 |
| 2014 | \$ 3,697,788 | 12,084,785 | 1,511,400 | | 369,600 | \$ 15,944,373 |
| 2015 | \$ 3,884,358 | 12,695,294 | 1,911,400 | | 369,600 | \$ 16,712,882 |
| 2016 | \$ 7,913,118 | 878,869 | 7,968,562 | 756,946 | 369,600 | \$ 17,447,896 |
| 2017 | \$ 8,270,000 | 922,812 | 7,968,562 | 756,946 | 369,600 | \$ 17,967,838 |
| 2018 | \$ 8,642,977 | 968,953 | 7,968,562 | 756,946 | 369,600 | \$ 18,406,084 |
| 2019 | \$ 9,032,775 | 1,017,401 | 7,968,562 | 756,946 | 369,600 | \$ 18,864,332 |
| 2020 | \$ 9,440,153 | 1,068,271 | 7,968,562 | 756,946 | 369,600 | \$ 19,343,497 |
| 2021 | \$ 9,865,904 | 1,121,684 | 7,968,562 | 756,946 | 369,600 | \$ 19,844,533 |
| 2022 | \$ 10,310,857 | 1,177,769 | 7,968,562 | 756,946 | 369,600 | \$ 20,368,441 |
| 2023 | \$ 10,775,876 | 1,236,657 | 7,968,562 | 756,946 | 369,600 | \$ 20,916,266 |
| 2024 | \$ 11,261,868 | 1,298,490 | 7,968,562 | 756,946 | 369,600 | \$ 21,489,101 |
| 2025 | \$ 11,769,779 | 1,363,414 | 7,968,562 | 756,946 | 369,600 | \$ 22,088,089 |
| 2026 | \$ 12,300,596 | 1,431,585 | 7,968,562 | 756,946 | 369,600 | \$ 22,714,425 |
| 2027 | \$ 12,855,352 | 1,503,164 | 7,968,562 | 756,946 | 369,600 | \$ 23,369,359 |
| 2028 | \$ 13,435,129 | 1,578,322 | 7,968,562 | 756,946 | 369,600 | \$ 24,054,200 |
| 2029 | \$ 14,041,053 | 1,657,239 | 7,968,562 | 756,946 | 369,600 | \$ 24,770,313 |
| 2030 | \$ 14,674,305 | 1,740,101 | 7,968,562 | 756,946 | 369,600 | \$ 25,519,130 |
| 2031 | \$ 15,336,116 | 1,827,106 | 7,968,562 | 756,946 | 369,600 | \$ 26,302,144 |
| 2032 | \$ 16,027,775 | 1,918,461 | 7,968,562 | 756,946 | 369,600 | \$ 27,120,919 |
| 2033 | \$ 16,750,627 | 2,014,384 | 7,968,562 | 756,946 | 369,600 | \$ 27,977,092 |
| 2034 | \$ 17,506,080 | 2,115,103 | 7,968,562 | 756,946 | 369,600 | \$ 28,872,371 |
| 2035 | \$ 18,295,605 | 2,220,858 | 7,968,562 | 756,946 | 369,600 | \$ 29,808,546 |
| 2036 | \$ 19,120,737 | 2,331,901 | 7,968,562 | 756,946 | 369,600 | \$ 30,787,486 |
| 2037 | \$ 19,984,082 | 2,448,496 | 7,968,562 | 756,946 | 369,600 | \$ 31,811,148 |
| 2038 | \$ 20,884,319 | 2,570,921 | 7,968,562 | 756,946 | 369,600 | \$ 32,881,577 |
| 2039 | \$ 21,821,201 | 2,699,467 | 7,968,562 | 756,946 | 369,600 | \$ 34,000,912 |
| 2040 | \$ 22,810,563 | 2,834,440 | 7,968,562 | 756,946 | 369,600 | \$ 35,185,482 |
| 2041 | \$ 23,859,320 | 2,976,162 | 7,968,562 | 756,946 | 369,600 | \$ 36,430,443 |
| 2042 | \$ 24,934,473 | 3,124,970 | 7,968,562 | 756,946 | 369,600 | \$ 37,744,943 |

25 Yrs Cumulative \$ 553,731,153

30 Yrs Cumulative \$ 707,279,715

KWA Supply Option Worksheet
KWA-2

Capacity: Flint ADD: 12 MGD / 1.604 MCF/Day
KWA ADD: 12 MGD / 1.604 MCF/Day

Annual Volume: Flint: 585,561 MCF
KWA: 585,561 MCF

2016 Cost of Supply: Flint WTP O&M: \$ 13.51 /MCF
KWA: \$ 1.50 /MCF

Escalation/Inflation Rate: Flint: 4.51% /Yr
KWA: 5.0% /Yr

Capital Expenditure: Capital: \$ 357,578,060
Bond Issuance (2.25% of Total): \$ 11,050,000

3 Years of Capitalized Interest: \$ 74,000,000
Reserve (10% of Total): \$ 49,000,000

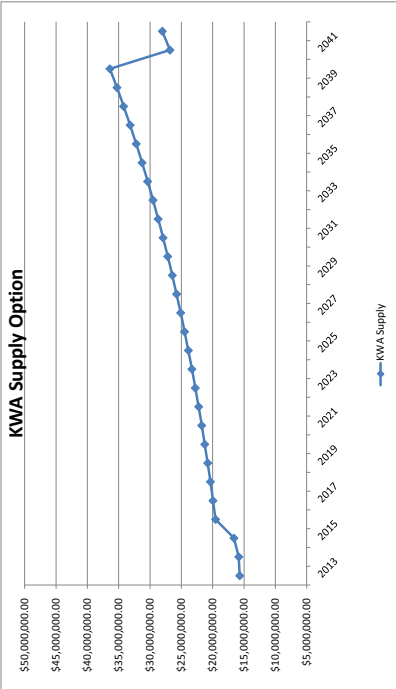
Flint's Share (30%): \$ 147,488,418
Revenue Bond Rate: 5%
Number of Years: 25
Annual Cost: \$10,464,666
Interest on Reserve: 3%

Check: 2.25%
Check: 5.0% /Yr (Bond Interest on Total)
Check: 10.0%

Capital: \$ 7,758,362
Bond Issuance (3% of Total): \$ 240,000
3 Years of Capitalized Interest: \$ 1,600,000
Reserve (10% of Total): \$ 1,070,000

Revenue Bond Rate: 5%
Number of Years: 25
Annual Cost: \$756,946
Interest on Reserve: 3%

Check: 2.25%
Check: 5.0% /Yr (Bond Interest on Total)
Check: 10.0%



| Year | Flint WTP O&M | Water Purchase | Pre-bond Entry Fee & Bond Payment | Flint Revenue Bond Payment | Interest on Reserve | TOTAL |
|------|---------------|----------------|-----------------------------------|----------------------------|---------------------|----------------|
| 2013 | \$ 3,538,214 | \$ 11,462,700 | \$ 1,162,800 | | \$ 473,100 | \$ 15,668,614 |
| 2014 | \$ 3,697,288 | \$ 12,034,785 | \$ 581,400 | | \$ 473,100 | \$ 15,840,873 |
| 2015 | \$ 3,864,558 | \$ 12,636,524 | \$ 581,400 | | \$ 473,100 | \$ 16,609,582 |
| 2016 | \$ 4,040,000 | \$ 13,268,869 | | \$ 756,946 | \$ 473,100 | \$ 17,540,500 |
| 2017 | \$ 4,222,000 | \$ 13,933,118 | | \$ 756,946 | \$ 473,100 | \$ 18,605,064 |
| 2018 | \$ 4,409,000 | \$ 14,633,377 | | \$ 756,946 | \$ 473,100 | \$ 19,802,423 |
| 2019 | \$ 4,601,000 | \$ 15,368,636 | | \$ 756,946 | \$ 473,100 | \$ 21,135,682 |
| 2020 | \$ 4,800,000 | \$ 16,140,895 | | \$ 756,946 | \$ 473,100 | \$ 22,611,041 |
| 2021 | \$ 5,006,000 | \$ 16,951,154 | | \$ 756,946 | \$ 473,100 | \$ 24,245,200 |
| 2022 | \$ 5,220,000 | \$ 17,799,413 | | \$ 756,946 | \$ 473,100 | \$ 26,040,469 |
| 2023 | \$ 5,442,000 | \$ 18,685,672 | | \$ 756,946 | \$ 473,100 | \$ 28,000,738 |
| 2024 | \$ 5,672,000 | \$ 19,609,931 | | \$ 756,946 | \$ 473,100 | \$ 30,147,007 |
| 2025 | \$ 5,910,000 | \$ 20,573,190 | | \$ 756,946 | \$ 473,100 | \$ 32,481,276 |
| 2026 | \$ 6,156,000 | \$ 21,576,449 | | \$ 756,946 | \$ 473,100 | \$ 35,004,545 |
| 2027 | \$ 6,410,000 | \$ 22,620,708 | | \$ 756,946 | \$ 473,100 | \$ 37,727,814 |
| 2028 | \$ 6,672,000 | \$ 23,707,967 | | \$ 756,946 | \$ 473,100 | \$ 40,662,083 |
| 2029 | \$ 6,942,000 | \$ 24,839,226 | | \$ 756,946 | \$ 473,100 | \$ 43,820,352 |
| 2030 | \$ 7,220,000 | \$ 26,016,485 | | \$ 756,946 | \$ 473,100 | \$ 47,205,621 |
| 2031 | \$ 7,506,000 | \$ 27,240,744 | | \$ 756,946 | \$ 473,100 | \$ 50,830,890 |
| 2032 | \$ 7,800,000 | \$ 28,513,003 | | \$ 756,946 | \$ 473,100 | \$ 54,709,159 |
| 2033 | \$ 8,102,000 | \$ 29,835,262 | | \$ 756,946 | \$ 473,100 | \$ 58,854,428 |
| 2034 | \$ 8,412,000 | \$ 31,208,521 | | \$ 756,946 | \$ 473,100 | \$ 63,271,697 |
| 2035 | \$ 8,730,000 | \$ 32,633,780 | | \$ 756,946 | \$ 473,100 | \$ 67,975,966 |
| 2036 | \$ 9,056,000 | \$ 34,112,039 | | \$ 756,946 | \$ 473,100 | \$ 72,972,235 |
| 2037 | \$ 9,390,000 | \$ 35,644,298 | | \$ 756,946 | \$ 473,100 | \$ 78,266,504 |
| 2038 | \$ 9,732,000 | \$ 37,231,557 | | \$ 756,946 | \$ 473,100 | \$ 83,864,773 |
| 2039 | \$ 10,082,000 | \$ 38,874,816 | | \$ 756,946 | \$ 473,100 | \$ 89,773,042 |
| 2040 | \$ 10,440,000 | \$ 40,575,075 | | \$ 756,946 | \$ 473,100 | \$ 95,998,311 |
| 2041 | \$ 10,806,000 | \$ 42,334,334 | | \$ 756,946 | \$ 473,100 | \$ 102,544,580 |
| 2042 | \$ 11,180,000 | \$ 44,153,593 | | \$ 756,946 | \$ 473,100 | \$ 109,415,849 |

\$ 25 Yrs Cumulative 606,657,940

\$ 30 Yrs Cumulative 766,784,313