PRELIMINARY REPORT TO ESSEXVILLE CITY COUNCIL

Options for Future Treatment of the City's Wastewater

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1.0 INTRODUCTION

Staff has been working with the Michigan Department of Environmental Quality (MDEQ), Hampton Township (Township), the Bay County Department of Water and Sewer (DWS), the City of Bay City, the United States Department of Agriculture (USDA) and various consultants to evaluate a number of options for the treatment of the City of Essexville (City) wastewater.

The options under consideration include; 1) continue operating the present wastewater treatment plant (WWTP), 2) retrofitting the WWTP to a pumping facility and transporting the influent to the West Bay County Regional Wastewater Treatment Plant (WBCRWWTP) or 3) retrofitting the WWTP to a pumping facility and transporting the influent to the City of Bay City's WWTP.

Each of the options is evaluated over a 15 – 20 year planning horizon.

2.0 BACKGROUND

With the 2005 renewal of the National Pollutant Discharge Elimination System (NPDES) permit for the operation of its WWTP, the City was ordered by the MDEQ to construct further improvements to the storm water pumping systems at the WWTP. The improvements are required as a component of the City's mandated combined sewer overflow (CSO) control program. The improvements must be constructed by 2010.

Milestone Events:

- May 2006 - The City Council authorizes a contract with Fishbeck, Thompson, Carr & Huber (FTCH) to assist the City in determining what improvements were necessary to comply with the permit.

- January 2007 – The City Council authorizes a contract with FTCH to prepare the required engineering report to qualify the City for a low interest loan through the State Revolving Fund (SRF) administered by the MDEQ.

- March 2007 - the City is approached by the Township about allowing the Township to construct a force main from the Township through the City in order to transport the Township's wastewater to the WBCRWWTP. The preferred route would bring the Township's force main to the Saginaw River adjacent to the City's WWTP.

  The City begins discussions with the Township and DWS regarding the feasibility of the City joining the Township project. Ken Miller, Director of the DWS, began working with the present owners of the WBCRWWTP to establish terms and conditions under which the Township and the City could purchase capacity and become owners of the facility.

  The City elected to participate in these discussions based on several factors including:

  1. the cost of improvements the City is required to make to its WWTP by 2010
  2. operational and staffing concerns at the City WWTP
  3. the overall age and condition of the City WWTP
  4. the potential savings by working with the Township and the DWS in exploring the alternative of sending the City's wastewater to the WBCRWWTP instead of continuing to operate a WWTP

- July 2007 - FTCH recommends the installation of two additional 10,000 gallon per minute (GPM) stormwater pumps and significant improvements to the electrical service at the plant. The cost of the proposed improvements is $2 million. The proposed CSO improvements were submitted to the MDEQ for its review in November 2007.

2.0 BACKGROUND (continued)

- June 2008 - the City Manager, Ken Miller and Township Supervisor Terry Spegel met with MDEQ to discuss what would be required for the City and the Township to connect their sewer systems to the WBCRWWTP.

- August 2008 - City Council authorizes sharing (with the Township) the cost of an engineering evaluation to determine what improvements would have to be made at the WBCRWWTP to facilitate receiving and treating the City and Township's wastewater.

- September 2008 - the City Manager is contacted by the Bay City WWTP Superintendent inquiring if the City would also consider sending its wastewater to the Bay City WWTP as an alternative to the City continuing to operate its own WWTP or sending its wastewater to the WBCRWWTP. Bay City directs its consultant, Hubbell, Roth & Clark, Inc., to conduct a feasibility analysis and develop an opinion of the probable cost for this option.

- September 2008 - to allow the City time to evaluate the WBCRWWTP and Bay City options, the City requested that the MDEQ defer enforcement action with respect to the construction schedule for the required improvements to the WWTP. The City advised the MDEQ that it would likely select an option by April 2009.

- September 2008 - the City Council authorizes the purchase of between 2,000 and 2,200 Residential Equivalent Units (REU) of capacity at the WBCRWWTP. The option to purchase must be exercised by December 31, 2009.

- February 2009 - the City Council authorizes a contract with FTCH to complete a facilities Assessment and Capital Improvements Plan for the WWTP over a 15 - 20 year planning horizon to assist in evaluating the option of the City continuing to operate a WWTP.

3.0 OVERVIEW OF CITY'S PRESENT WASTEWATER COLLECTION AND TREATMENT SYSTEMS

The City has a present population of 3,769 with minimal commercial and industrial development. Sanitary sewer service is provided to all of the present residents, commercial businesses and industrial facilities within the City limits. The sanitary sewer system serves a total area of 774 acres, including 340 acres serviced by combined sewer.

The City's wastewater treatment plant (WWTP) is rated for an average flow of 0.75 million gallons per day (MGD) and a peak flow of 1.85 MGD. Flow in excess of the plant hydraulic capacity is pumped to a 1.2 million gallon combined sewage overflow (CSO) retention basin using three 10,000 gallons per minute (GPM) pumps (20,000 gallon firm capacity).

Total diverted flow in excess of the retention basin holding capacity overflows to the Saginaw River. When total flow to the WWTP falls below the plant's rated capacity, the contents of the retention basin are drained back to the treatment plant influent pump station and pumped through the treatment process for complete treatment prior to discharge to the Saginaw River.

The sanitary sewer system serving the City primarily consists of gravity sewer with three pump stations and associated force mains. The City has three pump stations within the collection system: Borton at Main, Scheurmann at Borton, and Saline at Pine. The maximum capacity of the WWTP influent pumps is 1,500 GPM (firm capacity is 1,285 GPM) and the retention basin pump station has three pumps at 10,000 GPM (firm capacity 20,000 GPM).

The City constructed the WWTP in 1949 consisting of primary and disinfection treatment with anaerobic sludge digestion. Subsequent expansions added additional primary treatment, secondary treatment, and anaerobic digestion facilities.

3.0 OVERVIEW OF CITY'S PRESENT WASTEWATER COLLECTION AND TREATMENT SYSTEMS (continued)

The most recent upgrade to the treatment system completed in 1997 included new raw sewage pumps, a new grit removal mechanism, a new oxidation tower with feed pumping, two new secondary clarifiers, new chlorine contact chamber, modifications to the CSO Basin to provide additional retention, new combined sewage pumps, chemical feed system upgrades, and a new outfall.

The WWTP also treats combined sewerage collected during storm and snowmelt events. The treatment provided includes pumping, primary settling, and disinfection of combined sewage diverted to the CSO Basin prior to discharge to the Saginaw River.

4.0 DISCUSSION OF OPTIONS

Option 1 – Continued Operation of the City WWTP

1. The City would continue to operate the WWTP with its own employees or a subcontractor.
2. The City would construct the improvements to the storm water pumping system and electrical upgrades required under the NPDES permit and those improvements identified in the FTCH Facilities Assessment and Capital Improvements Plan classified as immediate and short-term in priority.
3. The City would undertake construction, over a ten year time frame the capital improvements identified in the FTCH Facilities Assessment and Capital Improvements Plan as long-term priorities.
4. None of the capital improvements made to the WWTP would increase capacity to treat the volume of the City's wastewater or better manage CSO events.
5. Capital Improvements will be financed over forty years with a loan from the United States Department of Agriculture – Rural Development.

Option 2 – Pump and Transfer to WBCRWWTP

1. The City would purchase between 2,000 and 2,200 REU of capacity and become an owner at the WBCRWWTP.
2. Improvements would be made to the CSO pumping facility to include storm water pumping system and electrical upgrades required under the NPDES permit and pumping capacity of 3,000 GPM to transfer up to 4.3 MGD to the WBCRWWTP. The 1.2 million gallon CSO basin would remain in operation.
3. All existing WWTP infrastructure related to primary and secondary treatment of wastewater would be demolished.
4. The new pump station would still be considered a CSO facility with overflows to the Saginaw River still permitted during extreme rain events.
5. City would pay a connection fee to the Township and WBCRWWTP for use of the force main crossing at the Saginaw River and for improvements made to the WBCRWWTP which are necessary to receive the City's influent (up to 4 MGD).
6. The project should reduce the number of CSO events from the City to the Saginaw River.
7. Capital Improvements will be financed over forty years with a loan from the USDA.

4.0 DISCUSSION OF OPTIONS (continued)

Option 3 – Pump and Transfer to the Bay City WWTP

1. The City would enter into a contract with the City of Bay City and become a wholesale customer of its sewer utility.
2. Improvements would be made to the CSO pumping facility to include storm water pumping system and electrical upgrades required under the NPDES permit and pumping capacity of 3,000 GPM to transfer up to 2.0 MGD to the Bay City WWTP. The 1.2 million gallon CSO basin would remain in operation.
3. All existing WWTP infrastructure related to primary and secondary treatment of wastewater would be demolished.
4. The new pump station would still be considered a CSO facility with overflows to the Saginaw River still permitted during extreme rain events.
5. City would pay for the cost of either a gravity line or force main which is necessary to transport the wastewater to the Bay City WWTP and other improvements necessary to receive the City's influent (up to 2 MGD).
6. The project will not reduce the number of CSO events from the City to the Saginaw River.
7. Capital Improvements will be financed over forty years with a loan from the USDA.

5.0 FINANCING OPTIONS

Act 279 Public Acts of Michigan, 1909 (Home Rule City Act), as amended, and the Essexville City Charter, provide that the net indebtedness of the City shall not exceed 10% of all assessed real and personal property in the City, plus assessed value equivalent of Act 198 Michigan Public Acts of 1974 (Plant Rehabilitation and Industrial Development Districts Act), as amended, specific tax levies.

Effective July 1, 2009 the City's assessed value will be $85,512,980 and the City's net outstanding debt will be $3,633,889. This will limit the City's ability to finance improvements under any of the options with commercial credit such as an installment loan or general obligation bonds. The costs for each of the options exceed the City's legal debt margin of $4,917,409.

The City will have to finance the improvements with either a 20 year SRF loan or a 40 year loan from the USDA. The present interest rate is 2.45% for an SRF loan and 3.75% for a USDA loan. In either case the debt service will have to be backed by revenue bonds issued by the City.

6.0 PROJECTED CAPITAL COSTS

Option 1 – Continued Operation of the City WWTP

The 2009 Facilities Assessment and Capital Improvements Plan identified $10.6 million in capital expenditures, inclusive of the $2,000,000 for the upgrade to the storm water pumping and electrical services required by the MDEQ to be constructed by 2010.

The capital expenditures were prioritized, based on the equipment's years of remaining useful life, as; 1) immediate (0-3), 2) short term (4-10) and 3) long term (10-20). All but $240,000 in projected capital expenditures were prioritized as either immediate or short term.

Based on the present cost and availability of financing I would recommend that City aggregate all of capital projects identified as the immediate and short term projects to be constructed at one time. The estimated capital cost for this approach would be $9,500,000.

6.0 PROJECTED CAPITAL COSTS (continued)

Option 2 – Pump and Transfer to WBCRWWTP

The projected capital cost to convert the WWTP to send our wastewater to WBCRWWTP is $8.18 million. Included in the capital cost is the buy-in cost for the City to purchase capacity at the WBCRWWTP, reimbursement for engineering expenses already incurred and related to the development of the project, retrofit of the WWTP to a pumping facility, the City's share of the cost of the force main crossing at the Saginaw River and the City's share of the cost for improvements required to be made at the WBCRWWTP to receive the City's wastewater.

The City's share of the cost for the force main and improvements at the WBCRWWTP will be treated as connection fees.

Option 3 – Pump and Transfer to the Bay City WWTP

The projected capital cost to convert the WWTP to send our wastewater to the Bay City WWTP is between $5.79 million and $8.79 million. The difference in the capital costs is between constructing a force main to transport the waster to the Bay City WWTP and constructing a gravity sewer, either in the railroad right of way or the public street right of way.

Included in the capital cost is reimbursement for engineering expenses already incurred and related to the development of the project, retrofit of the WWTP to a pumping facility and the cost of constructing the force main or gravity sewer and improvements to the Bay City WWTP to facilitate receiving the City's wastewater.

7.0 PROJECTED ANNUAL OPERATION AND MAINTENANCE COSTS FOR TREATMENT

Option 1 – Continued Operation of the City WWTP

Over the past three years the City has been operating the WWTP with 2 full time employees and contracting with the City's former Director of Public Works to provide general oversight and management of the WWTP. It is clear that the MDEQ will not allow the City to continue to staff the WWTP over the long term in this manner.

If the City Council were to select this option it would require the City to staff the WWTP with a full time Superintendent who possesses a Class B Wastewater license, one full time mechanic/operator and one half-time laboratory technician.

The City could also elect to contract the operation of the WWTP.

General operations and maintenance cost for the WWTP are based upon historical operating costs for the WWTP.

The annual cost for treatment with this option would be $393,556.

Option 2 – Pump and Transfer to WBCRWWTP

The annual cost for treatment would include operation and maintenance of the pump station, required contributions to an equipment replacement reserve and the costs of treating the wastewater at the WBCRWWTP.

The annual charge paid to the WBCRWWTP is based on an estimated 1,643 REU's of 1) dry weather influent; 2) an REU based annual contribution to a capital improvement reserve and 3) the treatment of an estimated 75,000,000 gallons of stormwater.

The REU charge is projected to be $123.25 for treatment of dry weather flow, $47.35 for the capital reserve and $25.00 for diluted influent.

The annual cost for treatment under this option would be $353,140.

7.0 PROJECTED ANNUAL OPERATION AND MAINTENANCE COSTS FOR TREATMENT (continued)

Option 3 – Pump and Transfer to the Bay City WWTP

The annual cost for treatment would include operation and maintenance of the pump station, required contributions to an equipment replacement reserve and the costs of treating the wastewater at the Bay City WWTP. The City's cost for treatment at the Bay City WWTP would be based on a wholesale rate of $5.25 per one hundred cubic feet (CCF) of billable flow.

The annual cost for treatment under this option would be $572,880.

8.0 BASIS FOR RATES

Cost Centers

Administrative – these costs include expenditures for accounting, billing, collections, general insurance, audit, legal and computer support/maintenance.

Collection System – these costs include expenditures for personnel, equipment and supplies used for the maintenance and operation of the sewer collection system.

Treatment – these costs include expenditures for personnel, equipment, utilities, supplies and depreciation related to the operation and maintenance of the treatment works.[1]

Equipment Replacement – this cost includes an annual contribution to an equipment reserve fund for the replacement of pumps, controls and other critical equipment with a useful life of 20 years or less used in the collection and treatment systems.

Assumptions Used for Rate Calculations

- The City will obtain an USDA loan to finance the projected capital expenditures for each option. The loan will be for a term of 40 years repaid at an annual interest rate of 3.75%.
- The City will not refinance the remaining debt on the SRF loan which was obtained in 1997 to finance improvements to the wastewater treatment plant. The loan will be repaid in 2018.
- The annual debt service for the SRF loan is common to all options.
- The administrative, collection system and equipment replacement costs are common to all options and based upon the projected cost for the 2009/2010 budget.
- A monthly REU charge will be assessed to all customers for debt service.
- Each residential unit will be assessed one REU.
- The number of REU's charged monthly to commercial, industrial, institutional and other customers is based upon one REU for each 75,000 gallons of billable flow.
- The calculation of the monthly charge per REU is based upon billing 1,643 REU's for the entire City.
- A commodity charge (rate per CCF) will be assessed for the operation and maintenance of the sewer system.
- The calculation of the commodity charge based upon a annual billable flow of 100,000 CCF for the entire City.

[1] For Option 1 these costs include the operation and maintenance of the City's wastewater treatment plant and CSO system. For Options 2 and 3 these costs include operation and maintenance of the pump station and the cost of treating the wastewater either at the WBCRWTTP or the Bay City WWTP.

9.0 PROJECTED RATES

Option 1 – Continued Operation of the City WWTP

DEBT SERVICE	
USDA Loan*	$ 466,888
SRF Loan	125,000
Subtotal Debt Service	$ 591,888
ADMINISTRATIVE	$ 83,163
COLLECTION SYSTEM	82,009
TREATMENT COSTS	393,556
EQUIP. REPLACEMENT	35,000
Subtotal O&M	$ 593,728
TOTAL ANNUAL COST	$ 1,185,616

Combined Sewer Charges:

Monthly REU Charge	$ 30.02
Commodity Charge (CCF)	$ 5.94

*Assumes the City will undertake recommended immediate and short term capital improvements as one project at an estimated cost of $9,500,000.

Option 2 – Pump and Transfer to the WBCRWWTP

DEBT SERVICE	
USDA Loan	$ 402,408
SRF Loan	125,000
Subtotal Debt Service	$ 527,408
ADMINISTRATIVE	$ 83,163
COLLECTION SYSTEM	82,009
TREATMENT COSTS	353,140
EQUIP. REPLACEMENT	35,000
Subtotal O&M	$ 553,312
TOTAL ANNUAL COST	$ 1,080,720

Combined Sewer Charges:

Monthly REU Charge	$ 26.75
Commodity Charge (CCF)	$ 5.53

9.0 PROJECTED RATES

Option 3 – Pump and Transfer to the Bay City WWTP (Force Main)

DEBT SERVICE	
USDA Loan	$ 284,555
SRF Loan	125,000
Subtotal Debt Service	$ 409,555
ADMINISTRATIVE	$ 83,163
COLLECTION SYSTEM	82,009
TREATMENT COSTS	572,880
EQUIP. REPLACEMENT	35,000
Subtotal O&M	$ 773,052
TOTAL ANNUAL COST	$ 1,182,607

Combined Sewer Charges:

Monthly REU Charge	$ 20.77
Commodity Charge (CCF)	$ 7.73

Option 3a – Pump and Transfer to the Bay City WWTP (Gravity – RR ROW)

DEBT SERVICE	
USDA Loan	$ 309,129
SRF Loan	125,000
Subtotal Debt Service	$ 434,129
ADMINISTRATIVE	$ 83,163
COLLECTION SYSTEM	82,009
TREATMENT COSTS	572,880
EQUIP. REPLACEMENT	35,000
Subtotal O&M	$ 773,052
TOTAL ANNUAL COST	$ 1,207,181

Combined Sewer Charges:

Monthly REU Charge	$ 22.02
Commodity Charge (CCF)	$ 7.73

9.0 PROJECTED RATES

Option 3b – Pump and Transfer to the Bay City WWTP (Gravity – Street ROW)

DEBT SERVICE	
USDA Loan	$ 431,994
SRF Loan	125,000
Subtotal Debt Service	$ 556,994
ADMINISTRATIVE	$ 83,163
COLLECTION SYSTEM	82,009
TREATMENT COSTS	572,880
EQUIP. REPLACEMENT	35,000
Subtotal O&M	$ 773,052
TOTAL ANNUAL COST	$ 1,330,046

Combined Sewer Charges:

Monthly REU Charge	$ 28.25
Commodity Charge (CCF)	$ 7.73