*Report*

# Broome County Wastewater Systems Financial Feasibility Study Broome County, New York

December 2007

# BROOME COUNTY

# WASTEWATER SYSTEMS

# FINANCIAL FEASIBILITY STUDY

# BROOME COUNTY, NEW YORK

Prepared for

BROOME COUNTY, NEW YORK

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# EXECUTIVE SUMMARY

Stearns & Wheler, LLC was retained by the Broome County Department of Planning and Economic Development to determine the financial feasibility of County involvement in wastewater management, ownership, and operation within Broome County. In this respect, it is the County's desire to examine whether consolidated services would enhance the ability to promote development within the County. Currently, the County does not have the authority to offer wastewater infrastructure to potential new developments without the approval of the local municipality that owns and operates that particular treatment facility and collection system.

In 2002, The Hudson Group, LLC completed a study which investigated the potential for Broome County to take ownership of and manage wastewater treatment systems within the County. The Hudson Group report developed eight recommendations for a County-owned system. The eight recommendations included:

1. Obtain ownership and operation of the Binghamton-Johnson City Joint Sewage Treatment Plant (BJCJSTP).

2. Phased investigation of Endicott and Northgate WWTPs.

3. Creation of a County sewer district.

4. Enacting a County sewer ordinance.

5. Finance costs of the new district.

6. Request and review proposals for operation and maintenance of the acquired plants.

7. Evaluation of primary and secondary treatment capacity.

8. Revise existing intermunicipal contracts to be consistent and fair.

As a follow-up to the Hudson Group report, the objective of this report is to determine the financial feasibility of proceeding with the eight recommendations.

The study area included the wastewater treatment and collection systems in the Greater Binghamton Area: the BJCJSTP, the Endicott WWTP, and the Northgate WWTP, as well as potential wastewater expansion areas in the Town of Kirkwood and the Airport Corridor. Stearns & Wheler conducted on-site visits to each facility, inventoried equipment, and gathered operations information and flow and load data. The data collected was utilized to determine the value of each facility, the facility operation costs, and available capacity for growth. The value of the treatment systems, coupled with the operation costs, was utilized to calculate the annual user cost that would result if the County were to take ownership of these wastewater systems.

Excess capacity for flow and load sharing was evaluated and it was determined that the Endicott and Northgate WWTPs are at or near their design flow capacity. There is reserve flow capacity at the BJCJSTP. Future treatment needs were determined for each facility. In light of the pending regulations and effluent discharge limits resulting from the Chesapeake Bay Initiative, improvements may be required at each facility. The effluent discharge limits set forth by the Chesapeake Bay Initiative focus on nitrogen and phosphorus removal. The current upgrade for the BJCJSTP includes nitrogen removal, but does not include phosphorus removal. The BJCJSTP does not presently have a phosphorus limit included in their discharge permit; but if a phosphorus limit was added as part of the Chesapeake Bay Initiative, the BJCJSTP would need to be upgraded for phosphorus removal. To meet the potential nitrogen and phosphorus limits at the Endicott and Northgate WWTPs, these facilities would need to be upgraded. Capital costs for future upgrades were compiled along with future operation and maintenance costs to determine future annual user costs based on compliance with the Chesapeake Bay Initiative.

Current staff at each facility was documented and compared to future staff required for operation and maintenance of each facility following upgrade to meet the Chesapeake Bay Initiative requirements. A staffing chart showing quantity and title of staff required with a County-owned system is presented in Chapter 4.

Alternatives for ownership structure include development of a sewer district, development of a sewer authority, or instituting intermunicipal agreements. The structure, procedures required to implement, and the powers of each entity are presented in this report.

To better evaluate the positive and negative aspects of County ownership of the wastewater systems, a risk benefit analysis was performed. The risks and benefits were evaluated for:

1. Capital costs.
2. User costs.
3. Operation and management.
4. Future costs.
5. Environmental benefits.
6. Growth potential.
7. Flow sharing.
8. Rate standardization.
9. Plant capacity.
10. Plant expandability.
11. Value to municipalities.

Based on the findings of the report, it appears feasible for the County to take ownership of the wastewater systems in the Greater Binghamton Area. Before ultimately deciding to do so, it is recommended that the following steps be implemented:

1. Discuss range of compensation to be paid to each municipality to determine willingness to sell, and starting point for purchase price negotiations.

2. Determine what ownership structure is preferred by County officials to take over the management, operation, and ownership of the wastewater systems in the Greater Binghamton Area.

3. Conduct a detailed evaluation and cost analysis for additional infrastructure and improvements required for flow sharing between treatment facilities.

4. Perform a plant capacity analysis for the Endicott and Northgate WWTPs to determine future plant expansion costs that are in addition to upgrade costs to meet the Chesapeake Bay Initiative.

5. Conduct a comprehensive financial analysis of Broome County to determine the borrowing power of the County and the payment terms for purchasing one or all three treatment systems.

6. Perform a user rate study based on the financial terms of actual money to be borrowed for purchasing the wastewater systems.

A summary of the financial feasibility evaluation and information developed is included in Table ES-1.

# TABLE ES-1

## COST SUMMARY ANALYSIS
## YEAR CONSTRUCTED DOLLAR VALUE

| Parameter | | BJCSTP | | BJCSTP Endicott WWTP | | BJCSTP Endicott WWTP Northgate WWTP [11] | | BJCSTP Endicott WWTP Northgate WWTP Kirkwood & Airport Corridor Expansions (Greater Binghamton Area) [11] | |
|---|---|---|---|---|---|---|---|---|---|
| | | WWTP Only | WWTPs, PSs, and Main Collector Sewers | WWTPs Only | WWTPs, PSs, and Main Collector Sewers | WWTPs Only | WWTP, PSs, and Main Collector Sewers | WWTPs Only | WWTP, PSs, and Main Collector Sewers |
| Capital Costs [1] | | $53,000,000 | $62,000,000 | $62,000,000 | $72,000,000 | $66,000,000 | $76,000,000 | $66,000,000 | $76,000,000 |
| Debt [2] | | $60,000,000 | $68,000,000 | $68,000,000 | $76,000,000 | $70,000,000 | $78,000,000 | $70,000,000 | $78,000,000 |
| Future Costs [3] | | $13,000,000 | $13,000,000 | $29,000,000 | $29,000,000 | $30,000,000 | $30,000,000 | $48,000,000 | $48,000,000 |
| Management & Operation | | -- | -- | -- | -- | -- | -- | -- | -- |
| - Current Costs | | $6,200,000 | $6,800,000 | $8,200,000 | $8,800,000 | $8,600,000 | $9,200,000 | $8,600,000 | $9,200,000 |
| - Future Costs [4] | | $6,900,000 | $7,500,000 | $9,800,000 | $10,400,000 | $10,300,000 | $10,900,000 | $11,000,000 | $11,600,000 |
| Number of Users [5] | | 27,405 | | 44,775 | | 47,175 | | 47,175 [12] | |
| 20-Year Financing [6] | Future User Costs (Capital Costs) [9] | $440 | $490 | $380 | $410 | $380 | $410 | $430 | $460 |
| | Future User Costs (Debt Takover) [10] | $470 | $510 | $390 | $420 | $390 | $410 | $430 | $460 |
| 30-Year Financing [7] | Future User Costs (Capital Costs) [9] | $390 | $430 | $340 | $360 | $340 | $360 | $370 | $400 |
| | Future User Costs (Debt Takover) [10] | $410 | $440 | $340 | $370 | $340 | $360 | $380 | $400 |
| 40-Year Financing [8] | Future User Costs (Capital Costs) [9] | $390 | $430 | $340 | $360 | $340 | $360 | $370 | $400 |
| | Future User Costs (Debt Takover) [10] | $410 | $450 | $350 | $370 | $340 | $360 | $380 | $400 |

Notes:

1. Capital costs represent the estimated value of the existing wastewater infrastructure.
2. It has been anticipated that any debt that may be outstanding for the Towns of Dickinson and Vestal sewer collection systems would be negligible as they pertain to the specific lines that have been identified for potential ownership and operation by the County under the "WWTPs, PSs, & Main Collector Sewers" scenario.
3. "Future Costs" represent the estimated cost to upgrade the WWTPs to meet the effluent requirements of the upcoming Chesapeake Bay Initiative.
4. "Future Costs" for the Management & Operation represents the estimated increase in the annual O&M costs based on the expected Chesapeake Bay Initiatve upgrades. The value listed is the sum of the "Current Costs" value plus the future costs. The additional Endicott O&M costs are based on data from the "Nutrient Removal Assessment for the Village of Endicott Wastewater Treatment Plant" October 2005 Report completed by Stearns & Wheler, LLC. The Binghamton-Johnson City Joint STP and the Northgate WWTP future cost increases have been estimated using ratios of the 2006 annual average plant flows for these plants to that of the Endicott WWTP.
5. "Number of Users" represents the actual number of sewer users or connections that are billed by their respective municipality for use of the sewer system. Numbers were obtained from each municipality. Number of users does not include households that are not currently connected to the sewer system.
6. 20-year financing is based on general bonding at an estimated interest rate of 5%.
7. 30-year financing is based on bonding through NYS Environmental Facilities Corporation at an estimated interest rate of 4%.
8. 40-year financing is based on federal bonding at an estimated interest rate of 5%.
9. "User Costs" are based on stated Capital Costs, Management & Operation, and Future Costs. "User Costs" do not include other non-County owned infrastructure that continue to be operated & financed by the individual municipalities.
10. "User Costs" are based on stated Debt , Management & Operation, and Future Costs. "User Costs" do not include other non-County owned infrastructure that continue to be operated & financed by the individual municipalities.
11. This section does not include the Pennview Package WWTP in the Town of Chenango.
12. Additional users associated with the expansions in the Town of Kirkwood and the Airport Corridor have not been included with this number as there currently are no available estimates for the number of new users that may be added.

Note: Separate costs for each facility are presented in Chapters 2 and 3.

# CHAPTER 1

# INTRODUCTION

Broome County has expressed an interest in the management, operation, and ownership of wastewater infrastructure in the County to achieve consolidation of municipal services and promote economic development in the region. In August 2002, a study was completed by The Hudson Group, LLC, titled *"Broome County Wastewater Management."* This report investigated the feasibility of County involvement in wastewater infrastructure in Broome County. The Hudson Group report evaluated all sewered and unsewered areas of the County to determine if there is sufficient justification for direct involvement of Broome County in the ownership and operation of the wastewater treatment plants (WWTPs) and collection systems (trunk sewers, collector sewers, pumping stations, combined sewer overflows) within the County. The report recommended a course of action which included:

1. Obtain ownership and operation of the Binghamton-Johnson City Joint Sewage Treatment Plant (BJCJSTP).

2. Phased investigation of Endicott and Northgate WWTPs.

3. Creation of a County sewer district.

4. Enacting a County sewer ordinance.

5. Finance costs of the new district.

6. Request and review proposals for operation and maintenance of the acquired plants.

7. Evaluation of primary and secondary treatment capacity.

8. Revise existing intermunicipal contracts to be consistent and fair.

As a follow-up to the Hudson Group report, the County retained Stearns & Wheler, LLC to explore whether it would be financially feasibility for the County to implement the eight

recommendations presented in the Hudson Group report. As this report was focused on economic growth, the Department of Planning and Economic Development led this project.

Although there are five major municipal wastewater treatment facilities located in Broome County (BJCJSTP, Endicott WWTP, Northgate WWTP, Deposit Water Pollution Control Plant, and Whitney Point WWTP), the Department of Planning and Economic Development has identified the greatest potential growth in Broome County to be located in and around the Greater Binghamton Area as shown on the attached map (Appendix A). Based on the County's interest in addressing the needs for growth, it was determined that this study would focus only on the three major wastewater treatment facilities that serve the Greater Binghamton Area: the BJCJSTP, the Endicott WWTP, and the Northgate WWTP. In addition, the County has identified two particular growth areas that are currently unsewered, and has requested that Stearns & Wheler develop preliminary cost estimates to provide wastewater services for these areas, which are unsewered portions of the Town of Kirkwood and the Airport Corridor. These areas are discussed in more detail in Chapter 3, along with the preliminary cost estimates.

Consolidation of services has been and is a goal of the Broome County Executive and many Broome County officials and that of New York State Governor Spitzer. Many counties in New York State have realized the benefits of consolidation of services for wastewater treatment, just as Broome County is currently investigating. A map of New York State highlighting counties that own and manage wastewater infrastructure is provided in Appendix A.

## 1.1 BACKGROUND

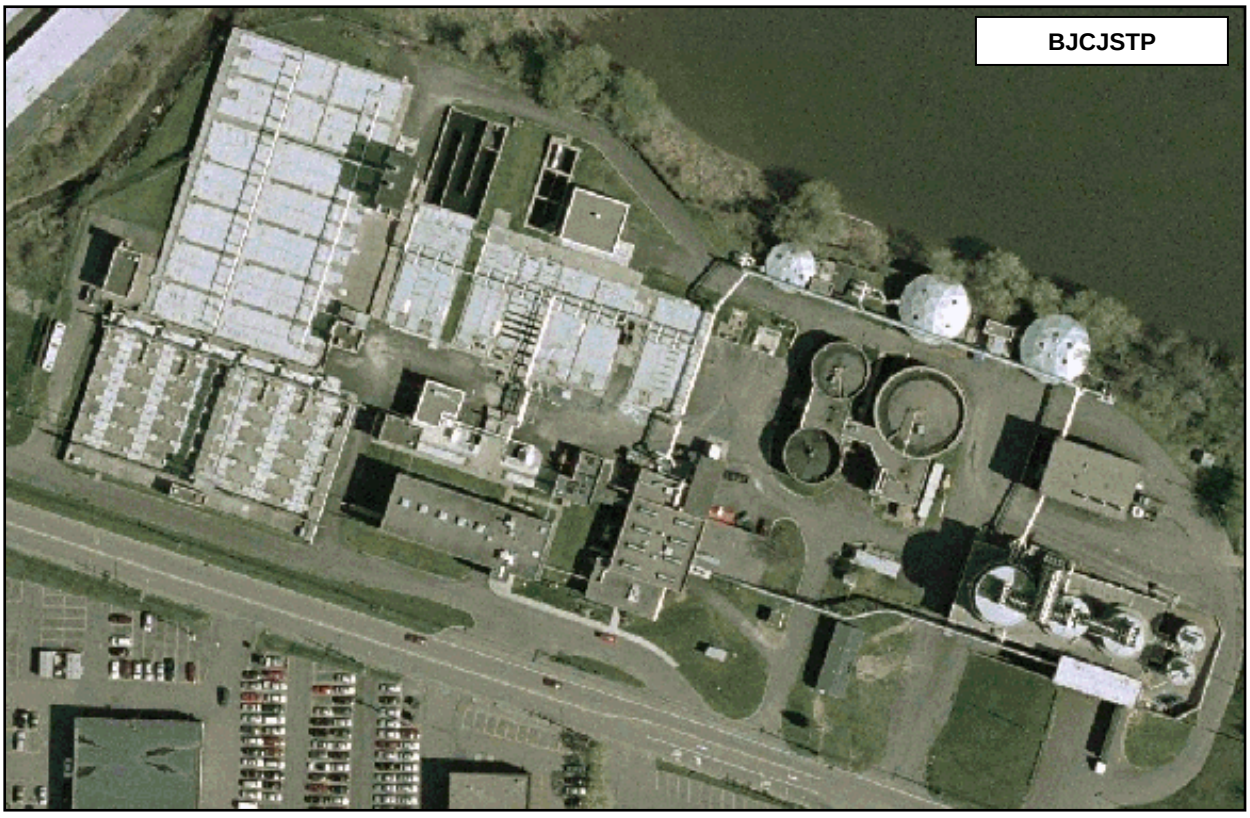
A. **Binghamton-Johnson City Joint Sewage Treatment Plant.** The BJCJSTP, located at 4480 Old Vestal Road in Vestal, is owned by the City of Binghamton and the Village of Johnson City, and is managed by the Binghamton-Johnson City Joint Sewage Board (Board). The Board is made up of representatives from the two municipalities. There are approximately 27,000 sewer connections throughout 10 different municipalities that are serviced by the BJCJSTP. Each municipality is charged a fee for the volume of wastewater they discharge to the BJCJSTP. This cost is governed by intermunicipal agreements between each municipality and the Board. The rates vary from $2.44 to $3.02 per 100 cubic feet of wastewater. Whenever a project is undertaken at the BJCJSTP or the Terminal Pump Station and force main operated by the Board, it is financed through the City of Binghamton, the Village of Johnson City, or both, but the cost is ultimately divided among the 10 municipalities served by the BJCJSTP through the user fees

that are charged. The City of Binghamton and the Village of Johnson City alternate for the title of lead agency for project management and other tasks related to the plant.

The following table provides a summary of the sewer connections and the length of sewer system associated with each municipality.

BJCJSTP SERVICE AREA INFORMATION

| MUNICIPALITY | NUMBER OF SEWER CONNECTIONS | LENGTH OF SEWER IN SYSTEM (MILES) |
|---|---|---|
| City of Binghamton | 13,975 | 200 |
| Village of Johnson City | 5,900 | 45 |
| Village of Port Dickinson | 724 | 7.6 |
| Town of Binghamton | 831 | 12 |
| Town of Conklin | 298 | 5.5 |
| Town of Dickinson | 1,100 | 13 |
| Town of Fenton | 351 | 2.2 |
| Town of Kirkwood | 581 | 11 |
| Town of Union | 150 | 5.1 |
| Town of Vestal | 3,495 | 44 |
| **Total** | **27,054** | **343** |



1. **Collection System**. The collection system for the BJCJSTP is divided into two separate service areas -- the Binghamton Service Area and the Johnson City Service Area. Approximately 74 percent of the flow received at the BJCJSTP is from the Binghamton Service Area, while the remaining 26 percent is from the Johnson City Service Area. These flow percentages are based on reported flow volumes from each municipality as provided to the Board for billing purposes. The following table summarizes each municipality's discharge location through the two service areas to the BJCJSTP. A map displaying these two service areas is located in Appendix A.

| BINGHAMTON SERVICE AREA | JOHNSON CITY SERVICE AREA |
|---|---|
| City of Binghamton | Village of Johnson City |
| Town of Vestal | Town of Vestal |
| Village of Port Dickinson | Town of Union |
| Town of Dickinson | Town of Dickinson |
| Town of Binghamton | |
| Town of Conklin | |
| Town of Kirkwood | |
| Town of Fenton | |

a. **Binghamton Service Area**. A series of pumping stations and gravity sewers owned by the various municipalities convey the Binghamton Service Area flows to the BJCJSTP. All of the wastewater from this service area, except for the Town of Vestal portion, is transported to the plant through a large trunk sewer that runs along the south side of the Susquehanna River. A portion of the Town of Vestal has its own gravity sewer line that flows directly into the plant.

b. **Johnson City Service Area**. All of the wastewater from the Johnson City Service Area is pumped directly to the BJCJSTP from the Terminal Pump Station, located west of the treatment plant at the end of Gates Road in Vestal. Wastewater from the Towns of Dickinson and Union passes through the Village of Johnson City sewers to the Terminal Pump Station, while the remaining portion of the Town of Vestal not served through the Binghamton Service Area has a separate gravity sewer to the Terminal Pump Station.

2. **Plant Description.** The BJCJSTP was originally constructed in 1958 as a primary treatment plant to serve the City of Binghamton. In 1968, capacity was added to accommodate wastewater from the Village of Johnson City. In 1972, the plant was upgraded to provide secondary treatment by adding aeration basins and secondary clarifiers. During the period from 1972 to 1993, several improvements were made to the plant, mostly related to solids handling and odor control.

In 1998, the first phase of three major upgrades to the BJCJSTP commenced. Phase I improvements included expansion of the odor control system throughout the plant and installation of the supervisory control and data acquisition (SCADA) system to monitor priority processes at the plant. Phase II improvements included improvement of the treatment plant's hydraulic throughput, installation of vortex grit removal systems, and conversion of the gaseous chlorine disinfection system to a liquid sodium hypochlorite system.

The Phase III improvements are currently under construction (2007) and include replacement of the aerated basins with biological aerated filters (BAFs); conversion of several existing secondary clarifiers into primary clarifiers; installation of new chlorine contact tanks and chemical feed systems; pump station upgrades; and solids handling improvements, including digester modifications and installation of new sludge pumps. Replacement of the aerated basins with BAFs is a significant upgrade to the plant and represents the first overall change in process since 1972. The BAF upgrade was designed to provide secondary treatment for carbonaceous removal, nitrification, and denitrification.

Per the C&S Engineers' design report dated June 2003, the average daily design flow rate for the BAFs is 26 million gallons per day (mgd), and the peak hourly design flow rate for the carbonaceous and nitrification BAFs is 60 mgd. The denitrification BAF has a peak hourly design flow rate of 49.5 mgd. Therefore, the average daily design flow rate for the plant influent is 26 mgd, with a peak hourly design influent flow rate of 60 mgd and a maximum month flow rate of 35 mgd.

After the upgrades are complete (Phases I through III), wastewater from the Binghamton Service Area will be pumped to the plant by an influent lift pump station, where it passes through influent screening and a vortex grit removal system. Wastewater from the Johnson City Service Area will be pumped directly into a separate vortex grit removal system at the

plant and will not receive influent screening. After the flows are degritted, the wastewater from the two service areas is combined prior to distribution to the primary clarifiers.

The upgraded BJCJSTP will have 10 primary clarifiers. Six of these units are existing, and four have been converted from secondary clarifiers to primary clarifiers as part of Phase III. These 10 units are rated for a peak flow of 60 mgd. Effluent from the primary clarifiers will be distributed to the new BAF system. The eight carbonaceous and eight nitrification filters are rated for a peak flow rate of 60 mgd. The BAF system also includes denitrification, which is rated for a peak flow rate of 49.5 mgd, and uses methanol feed as a carbon source for this biological process. Primary effluent will enter the carbonaceous filters, followed by the nitrification filters, and then the denitrification filters. The upgraded disinfection system will use liquid sodium hypochlorite in lieu of gaseous chlorine, followed by liquid sodium thiosulfite dechlorination. This system is rated for a peak flow rate of 60 mgd. After disinfection, the effluent flow is discharged into the Susquehanna River.

Solids handling at the BJCJSTP consists of gravity thickeners to thicken the primary and BAF sludge, followed by anaerobic digestion and centrifuge dewatering, or by centrifuge dewatering, and lime stabilization of the thickened sludge. The sludge is then transported to the Broome County Landfill for disposal.

State Pollutant Discharge Elimination System (SPDES) discharge permit (SPDES No. NY0024414) for the BJCJSTP has recently been revised based on the current upgrade that is still under construction. The permit for the BJCJSTP has several tiers of requirements based on the volume of flow being received at the plant. The summary table which follows contains the discharge permit limits for flows up to 35 mgd.

BJCJSTP SPDES PERMIT REQUIREMENTS

| PARAMETER | MONTHLY AVERAGE | WEEKLY AVERAGE |
|---|---|---|
| Flow | 35 mgd (12 month rolling average) | N/A |
| $CBOD_5$ | 18 mg/L[(1)] | 27 mg/L |
| TSS | 20 mg/L[(1)] | 30 mg/L |
| Settleable solids | 0.3 ml/l (daily maximum) | N/A |
| Ammonia as $NH_3$ (6/1 to 10/31) | 2200 lbs/day | N/A |
| TKN nitrogen as N | 45 mg/L (daily maximum)<br>13,700 lbs/day (daily maximum) | N/A |

| PARAMETER | MONTHLY AVERAGE | WEEKLY AVERAGE |
|---|---|---|
| Total nitrogen | 6.0 mg/L | N/A |
| Fecal coliform[(1)] | 200 /100 mL | 400 /100 mL |
| Total residual chlorine | 0.2 mg/L (daily maximum) | N/A |
| pH | 6.0 to 9.0 range | N/A |
| Total mercury | 200 ng/L (daily maximum) | N/A |
| Total cyanide | 10 lbs/day (daily average) | N/A |
| Copper, total recoverable | 20 lbs/day (daily maximum) | N/A |
| Iron, total recoverable | 290 lbs/day (daily maximum) | N/A |
| Lead, total recoverable | 18 lbs/day (daily maximum) | N/A |

(1) Based on a geometric mean.

B. **Endicott Wastewater Treatment Plant.** The Endicott WWTP, located on Anson Road in Endicott, is owned and operated by the Village of Endicott. The WWTP discharges the treated effluent to the Susquehanna River. There are three municipalities (Village of Endicott, Town of Union, Town of Vestal) that discharge wastewater to the Endicott WWTP. Each individual user is charged $1.25 per 1,000 gallons of wastewater. The following table provides a breakdown of the sewer connections and the length of sewer system (in miles) associated with each municipality.

ENDICOTT WWTP SERVICE AREA INFORMATION

| MUNICIPALITY | NUMBER OF SEWER CONNECTIONS | LENGTH OF SEWER IN SYSTEM (MILES) |
|---|---|---|
| Village of Endicott | 14,200 | 60 |
| Town of Union | (1) | 75 |
| Town of Vestal | 3,170 | 24 |
| **Total** | **17,370** | **159** |

(1) The total number of sewer connections for the Village of Endicott and the Town of Union are combined into one number, listed for the Village of Endicott.

The Village of Endicott operates the Argonne Avenue, Castle Gardens, Loder Avenue, and River Terrace Pumping Stations (see Greater Binghamton Area map in Appendix A), as well as an influent lift station located at the treatment plant. Wastewater from the Town of Union (flows that are not treated at the BJCJSTP) and the Village of Endicott is collected through a series of pumped force mains and gravity sewers. All the flow is combined and transported through one

pipe to the treatment plant. Flow from the Town of Vestal is pumped directly to the treatment plant from a pumping station located south of the plant on Castle Gardens Road in Vestal. A map showing the Endicott WWTP collection area is located in Appendix A.


The Endicott WWTP has a permitted maximum month flow of 10 mgd; the current average annual flow is 8.3 mgd with an associated maximum month flow of 14 mgd. The original plant was constructed in 1966 and included primary treatment. In 1973, the plant was upgraded to include secondary treatment with trickling filters. In 2002, the plant was again upgraded with new plastic media biotowers (trickling filters), solids contact tank, and additional secondary clarifiers.

The plant currently has influent screening and aerated grit chambers followed by three rectangular primary clarifiers. The effluent from the primary clarifiers flows to a pumping station that pumps the wastewater to the two biotowers. This pumping station constantly delivers 8 mgd of flow to each biotower. The flow to the biotowers is made up of a mixture of primary clarifier effluent and recycle flows. This same pumping station has a second set of pumps that pump the biotower effluent to a solids contact tank. Effluent from the solids contact tank is conveyed (via

gravity) to the secondary clarifiers. The activated sludge is returned to the solids contact tank and the waste sludge is sent to the primary clarifiers for co-settling. The secondary effluent is disinfected with sodium hypochlorite in a chlorine contact tank, and dechlorinated with sodium bisulfite prior to being discharged to the Susquehanna River.

The secondary treatment system is designed to treat a peak flow of 16 mgd. When plant influent exceeds 16 mgd, the additional primary clarifier effluent (greater than 16 mgd) automatically overflows directly into the chlorine contact tank for disinfection and discharge to the river.

The plant's solids handling system consists of gravity thickening of primary and waste activated sludge. The thickened sludge is anaerobically digested and dewatered with a belt filter press. The dewatered sludge is then mixed with sawdust and composted. The finished compost is sold wholesale.

The current discharge permit (SPDES No. NY0027669) for the Village of Endicott WWTP was issued in August 2003. The permit was amended in May 2005 to include effluent sampling, orthophosphate (OP), total phosphorus (TP), total Kjeldahl nitrogen (TKN), and nitrate ($NO_3$). A summary of the discharge permit limits is shown in the following table.

ENDICOTT WWTP SPDES PERMIT REQUIREMENTS

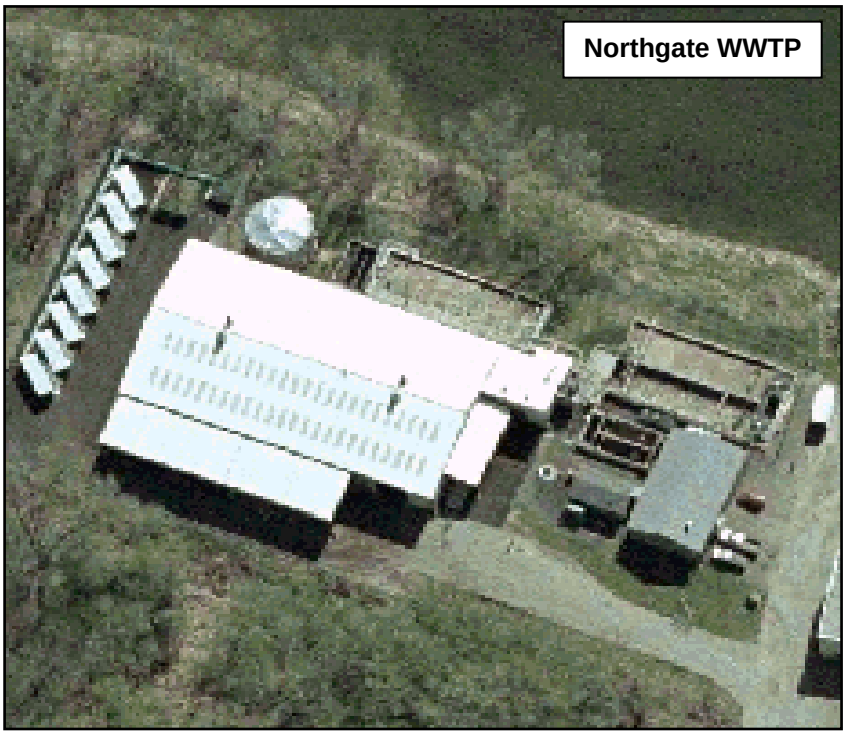
| PARAMETER | MONTHLY AVERAGE | WEEKLY AVERAGE |
|---|---|---|
| Flow | 10 mgd | N/A |
| $CBOD_5$ | 25 mg/L[(1)] | 40 mg/L[(1)] |
| TSS | 30 mg/L[(1)] | 45 mg/L[(1)] |
| Settleable solids | 0.3 ml/l (daily maximum) | N/A |
| Ammonia as $NH_3$ (6/1 to 10/31) | 830 lbs/day | N/A |
| Fecal coliform[(2)] | 200 /100 mL | 400 /100 mL |
| Total residual chlorine | 0.5 mg/L (daily maximum) | N/A |
| pH | 6.0 to 9.0 range | N/A |
| Copper, total recoverable | 10 lbs/day (daily maximum) | N/A |
| Iron, total recoverable | 88 lbs/day (daily maximum) | N/A |
| Lead, total recoverable | 4.7 lbs/day (daily maximum) | N/A |

(1) The effluent $CBOD_5$ and TSS shall not exceed 15 percent of the influent values.
(2) Based on a geometric mean.

C. **Northgate Wastewater Treatment Plant.** The Northgate WWTP is located in the Town of Chenango at 1137 Front Street in Binghamton, NY. This facility is the main facility of two municipal WWTPs owned and operated by the Town of Chenango. The second facility, the Pennview WWTP, is located north of the Northgate WWTP off of Route 11 (see Sewered Areas and Potential Growth Locations Map in Appendix A). This facility is a package plant that treats wastewater from an apartment complex.

Municipal wastewater from the town is treated at the Northgate facility and then discharged into the Chenango River. The treatment plant currently serves approximately 2,400 sewer connections that convey wastewater to the plant through a 42-mile sewer collection system. The plant also accepts approximately 30,000 gallons per day of leachate, 5 days per week, that is trucked from the Broome County Landfill. A map showing the Northgate WWTP collection area is located in Appendix A.

The treatment plant has a permitted maximum month flow of 0.8 mgd; the current average annual flow is 0.64 mgd with an observed maximum month flow of 0.94 mgd. The original plant was constructed in 1993 for 0.5 mgd, and was expanded in 1997 to treat the current maximum month flow of 0.8 mgd. In 2001, the facility received an upgrade to its composting facilities, which provided additional solids handling capacity.



An influent lift station pumps the wastewater to the plant. Currently, the treatment facility has an influent grinding operation that macerates the raw wastewater prior to biological treatment. There are three sequencing batch reactors (SBR) employed for the biological treatment process as well as sludge settling (clarification). The effluent flow from the SBRs is then disinfected using gaseous chlorine in the chlorine contact tank prior to discharge to the Chenango River.

The plant's solids handling system consists of aerobic digestion, belt filter press dewatering, and sludge composting. The dewatered sludge is mixed with sawdust and composted. The finished compost is sold wholesale.

The current discharge permit (SPDES No. NY0213781) for the Northgate WWTP was issued in April 2001. A summary of the discharge permit limits for the treatment plant are presented in the following table.

NORTHGATE WWTP SPDES PERMIT REQUIREMENTS

| PARAMETER | MONTHLY AVERAGE | WEEKLY AVERAGE |
|---|---|---|
| Flow | 0.80 mgd | N/A |
| $BOD_5$ | 30 mg/L(1) | 45 mg/L(1) |
| TSS | 30 mg/L(1) | 45 mg/L(1) |
| Settleable solids | 0.3 ml/l (daily maximum) | N/A |
| Fecal coliform(2) (5/1 to 10/1) | 200 /100 mL | 400 /100 mL |
| Total residual chlorine | 2.0 mg/L (daily maximum) | N/A |
| pH | 6.0 to 9.0 range | N/A |
| Total mercury | 200 ng/L (daily maximum) | N/A |
| Total cyanide | 10 lbs/day (daily average) | N/A |
| Copper, total recoverable | 20 lbs/day (daily maximum) | N/A |
| Iron, total recoverable | 290 lbs/day (daily maximum) | N/A |
| Lead, total recoverable | 18 lbs/day (daily maximum) | N/A |

(1) The effluent $CBOD_5$ and TSS shall not exceed 15 percent of the influent values.
(2) Based on a geometric mean.

# CHAPTER 2

# VALUATION

## 2.1 CAPITAL COSTS

The major goal of this study was to determine whether or not it would be financially feasible for Broome County to own and operate the three major wastewater treatment facilities. Therefore, it was necessary to evaluate each of the three wastewater treatment facilities and collection system components in the Greater Binghamton Area. The project team identified select collection system components for potential County acquisition based on the need to reach all of the existing Greater Binghamton Area sewered municipalities. A County-wide map and a Greater Binghamton Area map in Appendix A provide illustrations of the wastewater infrastructure identified by the project team for potential County acquisition.

Site visits were made to each of the three primary WWTPs to gain an understanding of how operations are conducted and to collect information on unit processes, equipment, and activities at each facility. During each site tour, the head operator was interviewed regarding the operations and general layout of the facility. Inventory sheets containing the equipment information collected during the site visits to the three wastewater treatment facilities are provided in Appendix B.

A. **Valuation Methodology.** For each WWTP included in the valuation, a list of buildings, tanks, equipment, and piping was developed identifying the year the item was constructed, and the total number of units present. For each item, one of two methods was used to determine the current value. Where available, the original purchase price of each item was obtained. This value is presented under the heading “Original Cost” in the “Construction Cost” column of the cost tables in Appendix C. If no original purchase price was available, an estimated value was assigned to the item based on current 2007 costs and was then derated back to the year it was constructed. The year 2007 value is presented under the heading “Estimated to 2007” in the “Construction Cost” column. The “Estimated to 2007” costs were adjusted to “Year of

Construction" dollars by applying the Engineering News-Record (ENR)[1] Construction Cost Index (CCI) ratio from January 2007 to the year each item was constructed. This value is presented in the "Year of Construction" column.

A depreciation rate was calculated for all costs based on a useful life of 20 years for equipment, 50 years for buildings, and 75 years for piping. Straight-line depreciation was used for all items. The depreciation rate is the dollar amount each item reduces in value per year of age. The depreciated value is the depreciation rate multiplied by the age of the item, subtracted from the "Year of Construction" construction cost. A sample calculation illustrating the methodology described above is included in Appendix B. The following table provides a summary of the asset valuations for each of the wastewater treatment facilities and associated collection system infrastructure.

CAPITAL COSTS

| WASTEWATER TREATMENT PLANTS | WWTPs ONLY(1) | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER(1) |
|---|---|---|
| BJCJSTP | $53,000,000 | $62,000,000 |
| Endicott WWTP | 9,000,000 | 10,000,000 |
| Northgate WWTP | 4,000,000 | 4,000,000 |
| **Total** | **$66,000,000** | **$76,000,000** |

(1) Costs are based on current (2007) dollar value.

Copies of the detailed asset valuation sheets for each of the facilities listed above are included in Appendix C, along with the ENR CCI table used in the asset valuation.

An alternative to the capital asset valuation would be for the County to acquire the existing facilities debt from each municipality for the selected wastewater infrastructure. The costs associated with this option are listed below.

[1] Engineering News-Record is an organization that tracks the increase and decrease of the cost of materials, labor, and construction. An ENR CCI is assigned to each year based on historical cost data. Historical construction costs can be converted to present-day construction costs by applying the ratio of the CCI for the year built and the 2007 CCI to the original cost. The reverse may also be done to convert present-day 2007 costs back to the year of original construction.

DEBT COSTS

| WASTEWATER TREATMENT PLANTS | WWTPs ONLY[1] | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER[1] |
|---|---|---|
| BJCJSTP | $60,000,000 | $68,000,000 |
| Endicott WWTP | 8,000,000 | 8,000,000 |
| Northgate WWTP | 2,000,000 | 2,000,000 |
| **Total** | **$70,000,000** | **$78,000,000** |

(1) Costs are based on current (2007) dollar value.

## 2.2 OPERATION AND MAINTENANCE (O&M) COSTS

Another significant cost associated with the ownership and operation of wastewater treatment facilities is the O&M costs. Unlike capital costs, which are finite, O&M costs are a recurring expense. Each of the wastewater treatment facilities in this study operates and maintains their respective unit processes and equipment with a full-time staff. The O&M costs used in this study are based on actual budget information obtained for each facility. These costs include staff salaries and benefits, electricity consumption, chemical consumption, spare parts, sludge disposal, building repair costs, etc. The current O&M costs for each facility are summarized below.

OPERATION AND MAINTENANCE COSTS

| WASTEWATER TREATMENT PLANT | COSTS[1] |
|---|---|
| BJCJSTP | $6,200,000 [2] |
| Endicott WWTP | 2,000,000 |
| Northgate WWTP | 360,000 |
| **Total[3]** | **$8,600,000** |

(1) Costs based on budget data collected from each facility.
(2) Includes BAF System that is currently under construction.
(3) Rounded.

## 2.3 USER COSTS

The capital and O&M costs associated with each wastewater treatment facility are paid for by the users that are connected into that facility. The charges levied against each user are referred to as user costs. Each treatment facility has its own system for charging its users, but generally, these

user costs are based on the volume of wastewater produced by each user, multiplied by a set rate of dollars per volume of wastewater.

A. **Valuation Methodology.** The user costs presented in this study have been developed using two different sets of capital asset values for the wastewater treatment facilities. One approach was to use the capital costs estimated from the asset valuation described in Section 2.1, and the second approach was to use the facility's debt based on the same assets included in the capital cost asset valuation. Regardless of the approach, the capital or debt costs used were annualized over 20 years at 5 percent interest, 30 years at 4 percent interest, and 40 years at 5 percent interest to show the different user costs under these three financing scenarios. The annualized values were then added to the annual O&M costs to develop the overall user costs. These user costs do not include costs associated with the local collection systems maintained by the individual municipalities.

The three financing scenarios identified above are based on the options generally available for municipal bonding. The 20-year, 5 percent interest financing option is known as general financing. The New York State Environmental Facilities Corporation provides improved financing based on 30 years at 4 percent interest, due to subsidized interest. The third financing option, 40 years at 5 percent interest, is a federal financing option available for certain qualifying projects. The anticipated user costs under the three financing scenarios to own and operate the facilities are summarized in the following tables.

ANNUAL USER COSTS
20-Year Financing at 5% Interest

| WWTPs | WWTPs ONLY[1] | | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER[1] | |
|---|---|---|---|---|
| | CAPITAL COST BASIS | DEBT TAKEOVER BASIS | CAPITAL COST BASIS | DEBT TAKEOVER BASIS |
| BJCJSTP | $380 | $400 | $430 | $450 |
| BJCJSTP/Endicott WWTP | $290 | $300 | $330 | $330 |
| BJCJSTP/Endicott WWTP/Northgate WWTP | $290 | $300 | $320 | $330 |

(1) Costs are based on current (2007) dollar value.

ANNUAL USER COSTS
30-Year Financing at 4% Interest

| WWTPs | WWTPs ONLY[1] | | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER[1] | |
|---|---|---|---|---|
| | CAPITAL COST BASIS | DEBT TAKEOVER BASIS | CAPITAL COST BASIS | DEBT TAKEOVER BASIS |
| BJCJSTP | $340 | $350 | $380 | $390 |
| BJCJSTP/Endicott WWTP | $260 | $270 | $290 | $290 |
| BJCJSTP/Endicott WWTP/Northgate WWTP | $260 | $270 | $290 | $290 |

(1) Costs are based on current (2007) dollar value.

ANNUAL USER COSTS
40-Year Financing at 5% Interest

| WWTPs | WWTPs ONLY[1] | | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER[1] | |
|---|---|---|---|---|
| | CAPITAL COST BASIS | DEBT TAKEOVER BASIS | CAPITAL COST BASIS | DEBT TAKEOVER BASIS |
| BJCJSTP | $340 | $350 | $380 | $390 |
| BJCJSTP/Endicott WWTP | $260 | $270 | $290 | $300 |
| BJCJSTP/Endicott WWTP/Northgate WWTP | $260 | $270 | $290 | $290 |

(1) Costs are based on current (2007) dollar value.

Widely varying user costs can be found for similar systems in New York State for which wastewater services have been consolidated. A number of factors can be attributed to this variability, such as level of treatment required at the wastewater treatment facility (e.g., nutrient removal), the inclusion of collection system components within the sewer district (e.g., sewer interceptors and pumping stations), overall system size, location, age, and the number of users contributing to the system. For comparison purposes with the estimated user costs presented above, three different sewer districts in New York State were contacted to determine their average user costs. The Saratoga County Sewer District charges its users an average fee of $140 per year, which varies from user to user based on proximity to the wastewater treatment facility and the costs required to convey the wastewater to the plant. In Onondaga County, the average user cost is approximately $300 per user; in Rockland County, the average per user cost for Rockland County Sewer District No. 1 is $525.

The estimated user costs presented above for the consolidated Broome County wastewater system compare favorably with these three example systems. The estimated fees for Broome County range from $260 to $450 per year compared to $140 to $525 per year for the three example systems. It should be noted that any additional wastewater conveyance fees that may be levied by local municipalities within the example systems are not included in the average user costs presented here.

# CHAPTER 3

# FUTURE TREATMENT NEEDS

One of the critical factors of the feasibility study for Broome County was the identification of available plant capacity for new users. Based on the level of information developed for this study, Stearns & Wheler utilized three major wastewater treatment parameters to determine if the wastewater treatment facilities had available capacity. These parameters are:

1. **Plant Flow**. Measured in volume of wastewater treated per day and reported as:

   - **Average Annual Flow** – The average of the daily volumes to be received for a continuous 12-month period.

   - **Maximum Month Flow** – The largest volume of flow to be received during a calendar month.

   - **Peak Day Flow** – The largest volume of flow to be received during a continuous 24-hour period.

2. **Biochemical Oxygen Demand (BOD)**. Measured in concentration, the amount of oxygen demand per liter (mg/L) of wastewater.

3. **Total Suspended Solids (TSS)**. Measured in concentration, amount of solids per liter (mg/L) of wastewater.

The following sections summarize the available information to determine the plant capacity at the BJCJSTP, Endicott, and Northgate facilities. This determination was based on the data available on the facilities' discharge monitoring reports over the last three years (2004, 2005, 2006), and on the facilities' SPDES permits, as issued by the New York State Department of Environmental Conservation (NYSDEC).

## 3.1 BINGHAMTON-JOHNSON CITY JOINT SEWAGE TREATMENT PLANT

The maximum 12-month rolling average flow at the BJCJSTP over the past three years has been 23.1 mgd, compared to a SPDES permitted 12-month rolling average effluent flow of 35 mgd. According to the June 2003 design report provided by the design engineer, C&S Engineers, the design average daily flow at the facility will be 26 mgd upon completion of the current upgrade project. Based on the stated design flow (26 mgd), there appears to be some excess plant capacity at the BJCJSTP, when compared with the maximum 12-month rolling average observed at the facility over the past three years (23.1 mgd).

Due to the construction being performed at the treatment plant for the current upgrade project, the facility is presently operating with interim permit limits and is only providing limited treatment to the wastewater being processed at the facility. Therefore, it is not possible at this time to determine if the facility will have excess treatment capacity for BOD and TSS removal upon completion of the current upgrade and implementation of their revised SPDES permit. A request has been made to the Binghamton-Johnson City Joint Sewage Board to obtain information on what the plant capacity is at the facility. In addition, once the current facility upgrade is complete, 18 months of plant optimization and testing will be conducted, which will aid in determining what level of treatment can be achieved at the facility.

## 3.2 ENDICOTT WWTP

The Endicott WWTP is currently permitted for a flow of 10 mgd on a maximum month basis under their SPDES permit. Based on the last modification performed at the facility, the maximum month design capacity is 10 mgd. Over the past three years, the Endicott facility has exceeded its permit limit for flow six times. Therefore, based on permitted and design plant flow, it does not appear that the Endicott WWTP has available flow capacity. Although, in terms of BOD and TSS removal, the Endicott facility has maintained effluent concentrations well below their permitted limit.

## 3.3 NORTHGATE WWTP

The Northgate WWTP is currently permitted for a plant flow of 0.8 mgd on a maximum month basis under their SPDES permit and was designed for this same flow during the facility's last upgrade. Over the past three years, the Northgate facility has experienced one permit exceedance

on flow. Therefore, based on permitted and design plant flow, the Northgate WWTP does not appear to have excess flow capacity.

In terms of BOD and TSS removal, the Northgate facility has maintained effluent concentrations well below their permitted limit.

A summary table containing the flows and loads for the three Greater Binghamton Area wastewater treatment facilities is provided in Appendix E, along with the supporting data for each facility.

## 3.4 CHESAPEAKE BAY INITIATIVE

The waters of the Chesapeake Bay have been and continue to be impaired by excess nutrients and sediments, which have deteriorated the aquatic habitat and fisheries. In 1983, the Chesapeake Bay Agreement was signed by Maryland, Pennsylvania, Virginia, the District of Colombia, the Chesapeake Bay Commission, and the U.S. Environmental Protection Agency. This Agreement was aimed at reducing nutrient, sediment, and toxin loadings to the Bay. However, the Chesapeake Bay waters remained impaired and efforts to reduce nutrient loadings were extended to the headwaters of the watershed with the signing of the Chesapeake Bay 2000 Agreement, which included Delaware, New York, and West Virginia. This Agreement includes the reduction of nutrient discharges from these states by 2010. The two wastewater treatment effluent parameters targeted for removal by the Chesapeake Bay Initiative are:

- **Total Nitrogen (TN) –** Measured in concentration, amount of nitrogen per liter (mg/L) of wastewater.

- **Total Phosphorus (TP) –** Measured in concentration, amount of phosphorus per liter (mg/L) of wastewater.

In New York State, the Susquehanna River Basin stretches across the central/southern portion of the State, and this watershed ultimately discharges to the Chesapeake Bay. NYSDEC has issued a draft tributary strategy for the Susquehanna River Basin (New York State Tributary Strategy for Chesapeake Bay Restoration, May 2007). This draft tributary strategy is proposing to implement new guidelines for the reduction of TN and TP for the largest wastewater treatment facilities on the Susquehanna River Basin in New York, but currently does not address the

smaller facilities within the river basin. This strategy is currently under review by USEPA and must be approved by them before it can be implemented by NYSDEC.

The draft tributary strategy for New York State has been set up with four action levels, each to be phased into action over time based on the results observed in the Chesapeake Bay and the need for more nutrient reduction:

1. Level One involves the establishment of an accurate nutrient discharge load to establish a baseline from which cost effective nutrient reduction upgrades can be identified, as well as ensuring compliance with existing New York State water quality program regulations.

2. Level Two of the draft tributary strategy is focused on establishing nutrient action level concentration limits (12 mg/L TN and 2 mg/L TP) for the discharge permits of significant wastewater treatment plants in the Chesapeake Bay watershed. Significant wastewater treatment plants are considered those receiving greater than 400,000 gallons per day. These action levels will be based on plant performance once sufficient monitoring data has been collected, and the facilities affected by these action level concentration limits will be required to take corrective action if they exceed these concentration limits. Facilities with higher action level concentrations (greater than 12 mg/L TN and 2 mg/L TP) will be required to investigate and implement actions to optimize nutrient removal, or enhance nutrient removal through minor treatment modifications.

3. Level Three of the draft tributary strategy will be to prioritize wastewater treatment plant improvements, which will involve major capital upgrades to these facilities. The prioritization will be based upon local water quality impairment, existing infrastructure deficiency, nutrient removal cost efficiency, and the overall potential for nutrient reduction to the Chesapeake Bay.

4. The final step outlined in the draft tributary strategy, Level Four, would involve widespread nutrient removal upgrades at the significant wastewater treatment plants discharging to the Chesapeake Bay. This would require all significant wastewater treatment plants to meet an effluent TN limit of 8 mg/L, or a limit of 5 mg/L TN for the largest seven facilities. In addition, the six largest facilities would be required to meet an

effluent TP of 0.5 mg/L, while the remaining significant wastewater treatment plants would be required to meet a TP of 1.0 mg/L.

Each of the three wastewater treatment facilities in the Greater Binghamton Area that are included in this study are located within the watershed described above and would be considered "significant wastewater treatment plants" by this standard (greater than 400,000 gpd). For the purpose of this study, it is anticipated that these facilities will be required to meet the removal requirements set forth by NYSDEC in the draft New York State Tributary Strategy. Based on the potential effluent nutrient limits for nitrogen and phosphorus that may be imposed on these wastewater treatment facilities under the Level Four action of the draft tributary strategy, we have anticipated the plant upgrades that will be required at the three facilities to bring them into compliance with the Chesapeake Bay Initiative. Therefore, the future treatment needs for all three facilities have been factored into this study, and preliminary costs for these upgrades have been included to more accurately evaluate what the County's future costs would be if they proceed with the acquisition of wastewater infrastructure in Broome County.

A. **Binghamton-Johnson City Joint Sewage Treatment Plant.** The current plant upgrade, which is still under construction, has been designed for removal of TN. The new BAF system is designed to provide nitrification and denitrification of the wastewater for nitrogen removal, but it will not be known if the facility will have additional capacity for this parameter until the facility is operational and data can be collected for a period of approximately 18 months. The upgraded BJCJSTP will have a permit limit of 6.0 mg/L TN.

The new SPDES permit for the upgraded BJCJSTP does not have an effluent total phosphorus limit. It is currently unknown what, if any, effluent total phosphorus limit will be required by NYSDEC for this facility in the future. For phosphorus removal, the upgraded plant will provide chemically enhanced primary clarification, which should improve the total phosphorus removal at the facility. For the purposes of this study, and to provide a conservative approach for the County, it is anticipated that BJCJSTP will require effluent filtration to achieve a low effluent total phosphorus level. Therefore, the future costs for this facility consider the addition of an effluent phosphorus removal system.

B. **Endicott WWTP**. The Endicott WWTP currently provides secondary treatment and has a seasonal effluent ammonia permit limit. NYSDEC has not issued any new SPDES permit limits for the Endicott facility at this time, based on the draft tributary strategy for the Susquehanna

River Basin and the Chesapeake Bay Initiative. For the purposes of this study, it is anticipated that future effluent total nitrogen and total phosphorus limits will be issued. This will provide the County with a more conservative approach in terms of the potential capital improvements that may be required at this facility. Based on this information, it is estimated that an effluent denitrification filter will be required to remove the nitrogen and filter out the phosphorus.

C. **Northgate WWTP**. The Northgate WWTP currently provides secondary treatment. NYSDEC has not issued any new SPDES permit limits for the Northgate facility at this time, based on the draft tributary strategy for the Susquehanna River Basin and the Chesapeake Bay Initiative. For the purposes of this study, it is anticipated that future effluent total nitrogen and total phosphorus limits will be issued. This will provide the County with a more conservative approach in terms of the potential capital improvements that may be required at this facility.

D. **Potential Chesapeake Bay Initiative Costs.** Based on the approach selected for this study in regard to the potential impacts of the Chesapeake Bay Initiative and the subsequent tributary strategy for the Susquehanna River Basin by NYSDEC, preliminary planning costs have been estimated for future treatment plant upgrades at each of the three facilities discussed above. The following table summarizes these future costs:

CHESAPEAKE BAY INITIATIVE FUTURE COSTS

| WASTEWATER TREATMENT PLANT | COSTS (1) |
|---|---|
| BJCJSTP | $13,000,000 |
| Endicott WWTP | 16,000,000 |
| Northgate WWTP | 1,000,000 |
| **Total** | **$30,000,000** |

(1) Costs represent current (2007) dollars.

It is also anticipated that the O&M costs for each facility will increase as a result of the Chesapeake Bay Initiative upgrades. These cost increases would be needed to accommodate items such as new equipment, chemicals, and additional electrical consumption. The following table summarizes the estimated future O&M costs for each facility. These future O&M costs are a combination of the current O&M costs and the additional costs associated with the Chesapeake Bay Initiative upgrades.

FUTURE OPERATION AND MAINTENANCE COSTS

| MUNICIPALITY | COSTS |
|---|---|
| BJCJSTP [1] | $6,900,000 |
| Endicott WWTP [2] | 2,900,000 |
| Northgate WWTP [2] | 430,000 |
| **Total** [3] | **$11,000,000** |

(1) Increases for the future O&M costs at the BJCJSTP are based on the addition of an effluent filtration system for phosphorus removal.
(2) Costs for the Endicott WWTP are based on information presented in the "Nutrient Removal Assessment for the Village of Endicott Wastewater Treatment Plant" Report from October 2005 completed by Stearns & Wheler, LLC. Costs for the Northgate WWTP are scaled from the Endicott WWTP cost based on average annual flow.
(3) Rounded.

## 3.5 OTHER TREATMENT NEEDS

The County has identified two specific areas in Broome County that would benefit from new or expanded wastewater service: the Town of Kirkwood, and the Airport Corridor. To accommodate new growth and increase the number of wastewater connections to existing users in the Town of Kirkwood and the Airport Corridor, it was determined that new wastewater treatment facilities or collection sewers would be required.

A. **Town of Kirkwood.** One of the potential growth areas, the Town of Kirkwood, is located east of the City of Binghamton. As a potential growth area, the County requested that Stearns & Wheler investigate the feasibility of bringing additional flows from Kirkwood to the BJCJSTP, where the Town's current flows are conveyed. The County also stated that there are potential hydraulic capacity limitations in the existing gravity sewers in the City of Binghamton that are currently limiting their ability to convey Kirkwood wastewater to the BJCJSTP. Therefore, it was decided that there were two options available for conveying and treating additional wastewater flows from the Town of Kirkwood: (1) installation of a new gravity sewer, pumping station, and force main; or (2) construction of a new WWTP in the Town of Kirkwood. Preliminary cost estimates have been developed for both alternatives.

In estimating the costs for Option One (new gravity sewer line, pumping station, and force main), it was anticipated that the new sewer lines would parallel the existing lines from the east side of the City of Binghamton to the BJCJSTP, via the Pennsylvania Avenue Pumping Station

(Penn Ave PS). It has been estimated that a new 15- to 18-inch gravity sewer would be adequate to handle the remaining wastewater flows from the currently unsewered portions of the Town of Kirkwood, as well as provide capacity for future growth in the Town. It has been estimated that the new parallel gravity sewer line would convey the Kirkwood wastewater to the existing Penn Ave PS, where modifications would be completed to provide new pumping facilities to convey these additional Kirkwood flows to the BJCJSTP, via a new 8-inch force main. It is anticipated that this force main would roughly parallel the existing line from the Penn Ave PS to the BJCJSTP.

The estimated cost of construction for this option is $11,800,000. This estimate is preliminary in nature and does not account for potential issues that may be present with regard to constructability (i.e., poor soils, existing underground utilities, or limited easement use) during installation of these new facilities, and other factors that may impact costs that have not been identified at this level of estimating. In addition, this cost does not include the infrastructure required within the Town of Kirkwood to convey the wastewater to the discharge point of the two existing force mains from the Town into the City of Binghamton.

Option Two, which involves construction of a new WWTP in the Town of Kirkwood, anticipates that a new packaged WWTP would be installed in the Town to serve the remaining unsewered areas of Kirkwood. This packaged WWTP has been sized to handle approximately 500,000 gpd and produce an effluent that will meet the requirements of the draft Chesapeake Bay Tributary Strategy for nutrient removal (TN limit, 5 mg/L; TP limit, 0.5 mg/L). The estimated cost of construction for this option is $9,700,000, which includes site work, structural foundation, Administration Building, emergency generator, and interconnecting piping and electrical wiring to and from the package plant. Examples of costs not included in this estimate are property acquisition for treatment plant, dewatering facilities (it is anticipated that sludge would be transported to another facility for dewatering), and the outfall pipe for the WWTP (which would vary depending on the location of the plant). The estimated O&M costs for this plant are approximately $500,000 per year.

Based on the preliminary construction cost estimates that have been developed, Option Two would be the more cost-effective alternative in terms of capital costs for addressing new wastewater flows from the Town of Kirkwood, but would also be anticipated to result in higher O&M costs over time as compared to Option One. The anticipated higher O&M costs associated with Option Two (WWTP) can be attributed to higher electrical costs to operate plant equipment,

more equipment maintenance, chemical costs, and a small staff of full-time personnel to operate the plant. In contrast, the O&M costs associated with Option One would be anticipated to include pumping station electrical costs, sewer and pumping station maintenance, and part-time personnel to service these systems. A more thorough study of these options would be recommended before proceeding with one or the other.

A summary of the cost estimates for these two options is located in Appendix F.

B. **Airport Corridor.** Currently, there is no public sewer service available at the Broome County Airport and the nearby area known as the Airport Corridor, located north of the Village of Johnson City in the Town of Maine. The County has expressed an interest in providing public sewers for this area to promote growth for nearby businesses located within the Airport Corridor that are currently limited due to a lack of wastewater capacity. Therefore, Stearns & Wheler was asked to develop a preliminary cost estimate for installation of a new packaged WWTP and collection system to convey and treat wastewater flows from the airport and nearby businesses. This packaged plant has been sized to treat 40,000 gpd and has been designed to produce low effluent levels of suspended solids and organic matter to meet NYSDEC requirements for discharge to an intermittent stream, as is required for this location based on the information provided. In addition, due to the Chesapeake Bay Initiative, the plant has also been designed for nutrient removal (effluent TN, 5 mg/L; TP, 0.5 mg/L). The preliminary estimated cost for construction of this packaged WWTP, including site work, buildings, equipment, and the interconnecting piping and electrical wiring, is $2,900,000.

To convey wastewater from the Airport and Airport Corridor to this WWTP, a collection system would need to be installed, consisting of a combination of gravity sewers, pumping stations, and force mains. A preliminary cost estimate of $5,100,000 was developed for this collection system based on existing quantity takeoffs presented in a 2003 report by Clough Harbor & Associates, LLP regarding wastewater infrastructure for the Airport Corridor. Therefore, the total estimated project cost for the Airport Corridor of $8,000,000. The O&M costs associated with the new WWTP and collection system have been estimated at approximately $150,000 per year.

A summary of this cost estimate is located in Appendix F.

## 3.6 FUTURE USER COSTS

Future user costs are anticipated to increase as a result of the Chesapeake Bay Initiative upgrades, as described in Section 3.4. The anticipated user cost increases associated with these upgrades are unrelated to County acquisition of wastewater infrastructure and would be incurred with or without County involvement, as required by the NYSDEC to satisfy the Chesapeake Bay Initiative. If the County opted to carry out the future wastewater expansion options for the Town of Kirkwood and the Airport Corridor, the costs associated with these projects would also be anticipated to increase future user costs. It should be noted that no additional users have been included for the estimated future user costs; therefore, the rates will be skewed higher than what would actually be anticipated. There are currently no estimates as to the number of users that would be added to the system with these expansions. For the purposes of estimating the future user costs, Option Two (new WWTP ) was used.

The following tables summarize the estimated future user costs with the addition of the Chesapeake Bay Initiative upgrades as well as the future expansions in the Town of Kirkwood and the Airport Corridor and their corresponding increased O&M costs. The future user costs were estimated under the same three financing scenarios used in Chapter 2.

ANNUAL FUTURE USER COSTS [1,4]
20-Year Financing at 5% Interest

| COUNTY ACQUISITION | WWTPs ONLY[1, 2] | | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER[1, 2] | |
|---|---|---|---|---|
| | CAPITAL COST BASIS[3] | DEBT TAKEOVER BASIS | CAPITAL COST BASIS[3] | DEBT TAKEOVER BASIS |
| BJCJSTP | $440 | $470 | $490 | $510 |
| BJCJSTP/Endicott WWTP | $380 | $390 | $410 | $420 |
| BJCJSTP/Endicott WWTP/ Northgate WWTP | $380 | $390 | $410 | $410 |
| Greater Binghamton Area[3] | $430 | $430 | $460 | $460 |

(1) Costs are based on current (2007) dollar value.
(2) The capital cost and debt takeover values include the estimated costs for the potential Chesapeake Bay Initiative upgrades.
(3) The Greater Binghamton Area represents the BJCJSTP, Endicott WWTP, Northgate WWTP, and expansions for the Town of Kirkwood and the Airport Corridor (package WWTPs).
(4) In addition to the annual future user costs, a one-time connection fee in the range of $300 to $400 will be charged for new sewer connections. Existing sewer connections will not incur a connection fee.

ANNUAL FUTURE USER COSTS [1,4]
30-Year Financing at 4% Interest

| COUNTY ACQUISITION | WWTPs ONLY[1, 2] | | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER[1, 2] | |
|---|---|---|---|---|
| | CAPITAL COST BASIS[3] | DEBT TAKEOVER BASIS | CAPITAL COST BASIS[3] | DEBT TAKEOVER BASIS |
| BJCJSTP | $390 | $410 | $430 | $440 |
| BJCJSTP/Endicott WWTP | $340 | $340 | $360 | $370 |
| BJCJSTP/Endicott WWTP/ Northgate WWTP | $340 | $340 | $360 | $360 |
| Greater Binghamton Area[3] | $370 | $380 | $400 | $400 |

(1) Costs are based on current (2007) dollar value.
(2) The capital cost and debt takeover values include the estimated costs for the potential Chesapeake Bay Initiative upgrades.
(3) The Greater Binghamton Area represents the BJCJSTP, Endicott WWTP, Northgate WWTP, and expansions for the Town of Kirkwood and the Airport Corridor (package WWTPs).
(4) In addition to the annual future user costs, a one-time connection fee in the range of $300 to $400 will be charged for new sewer connections. Existing sewer connections will not incur a connection fee.

ANNUAL FUTURE USER COSTS [1,4]
40-Year Financing at 5% Interest

| COUNTY ACQUISITION | WWTPs ONLY[1, 2] | | WWTPs, PUMP STATIONS, AND MAIN COLLECTOR SEWER[1, 2] | |
|---|---|---|---|---|
| | CAPITAL COST BASIS[3] | DEBT TAKEOVER BASIS | CAPITAL COST BASIS[3] | DEBT TAKEOVER BASIS |
| BJCJSTP | $390 | $410 | $430 | $450 |
| BJCJSTP/Endicott WWTP | $340 | $350 | $360 | $370 |
| BJCJSTP/Endicott WWTP/ Northgate WWTP | $340 | $340 | $360 | $360 |
| Greater Binghamton Area[3] | $370 | $380 | $400 | $400 |

(1) Costs are based on current (2007) dollar value.
(2) The capital cost and debt takeover values include the estimated costs for the potential Chesapeake Bay Initiative upgrades.
(3) The Greater Binghamton Area represents the BJCJSTP, Endicott WWTP, Northgate WWTP, and expansions for the Town of Kirkwood and the Airport Corridor (package WWTPs).
(4) In addition to the annual future user costs, a one-time connection fee in the range of $300 to $400 will be charged for new sewer connections. Existing sewer connections will not incur a connection fee.

If the County does not choose to proceed with the acquisition of wastewater infrastructure within the County, the wastewater treatment facilities will still be required to upgrade as necessary to meet the requirements of the Chesapeake Bay Initiative. As a result, the future user costs associated with each wastewater treatment facility will still be anticipated to increase without County acquisition of these facilities. The graphs located in Appendix D show the estimated future user fees for each wastewater treatment facility without County involvement compared with the estimated future user fees if the County were to acquire the BJCJSTP, Endicott WWTP, and Northgate WWTP.

# CHAPTER 4

# STAFFING EVALUATION

## 4.1 CURRENT STAFF

Staffing costs represent a large portion of the annual operating budgets for the wastewater treatment facilities evaluated. The cost for staff salaries plus benefits represents approximately 45 percent of each treatment plant's annual operating budget. Any increased efficiency in staff utilization could eliminate the need to hire additional staff or eliminate the need to fill positions that have been vacated. A comparison of current staff at each treatment plant and a suggested staff distribution for a County-owned system is presented.

A. **Binghamton-Johnson City Joint Sewage Treatment Plant.** There are currently 34 staff positions at the BJCJSTP. Figure 4-1 illustrates the distribution and title of current staff, which generally consists of a superintendent, assistant superintendent, secretary, mechanics, electricians, laboratory personnel, operators, and maintainers. The actual number of personnel at the plant is less than 34, as some positions are vacant. Stearns & Wheler completed a staffing and organization structure evaluation of the BJCJSTP to determine how many additional staff will be required to operate the facility after it is upgraded for nutrient removal. Based on the new and additional processes and testing required for the upgrade, it was determined that 14 additional staff will be required. This will result in a total of 48 staff members for the upgraded facility. Figure 4-2 illustrates the distribution and title of the staff required for the upgraded plant. Additional staff included more mechanics, operators, and electricians; and the addition of staff for office management, controls programming, instrumentation, and building and grounds.

B. **Endicott WWTP.** There are currently 12 staff at the Endicott WWTP. Figure 4-3 illustrates the distribution and title of current staff. The staff generally consists of a senior operator, operators, mechanics, laborers, and laboratory technicians. With future upgrades for nutrient removal, it is projected that one additional laborer would be required for the new and additional processes. The future projected staff is presented in Figure 4-4.

C. **Northgate WWTP.** There are currently four staff at the Northgate WWTP. Figure 4-5 illustrates the distribution and title of current staff. The staff generally consists of a senior operator, an operator, a mechanic, and a laborer. Due to the smaller capacity of the Northgate WWTP, it is projected the current staff level will be adequate to operate and maintain future upgrades for nutrient and phosphorus removal requirements due to the Chesapeake Bay Initiative.

## 4.2 FUTURE STAFF FOR COUNTY-OWNED SYSTEM

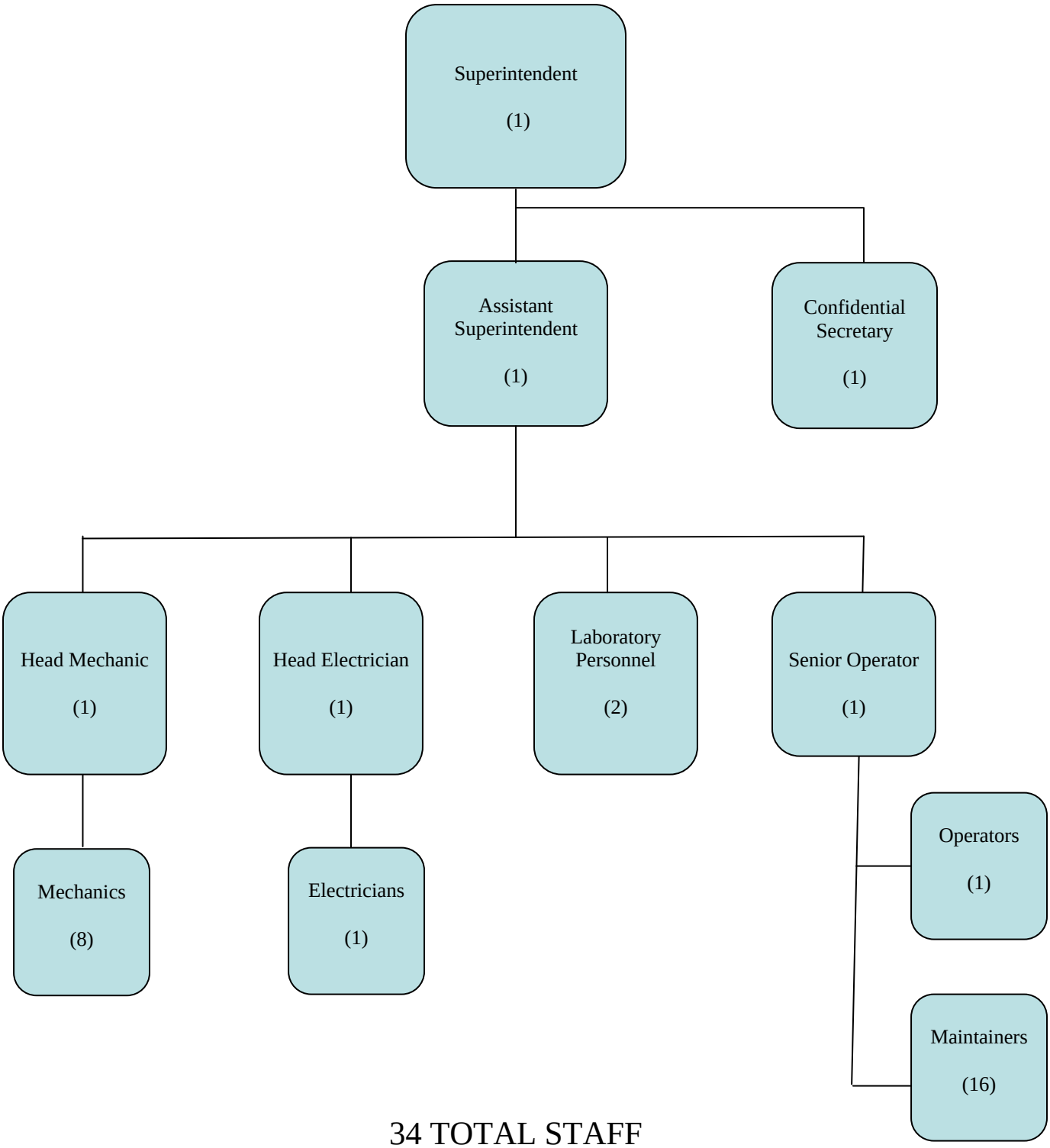
If the County were to own and operate the facilities, the total staff required for the BJCJSTP, Endicott, and Northgate WWTPs is 65 personnel based on future upgrades for nutrient and phosphorus removal. It is proposed that no net increase in staff would be required if the County were to own theses treatment plants, major pump stations, and main trunk sewers. Figure 4-6 illustrates the staff distribution and title for a County-owned system. It is proposed that the existing staff from each facility will be utilized to fill similar positions for the entire system. For example, a senior operator or plant manager would fill the roles of system administrator and assistant system administrator. Current mechanics, laborers, and electricians would be shared among the three plants as work requirements dictate. Senior operators could be assigned to a specific plant, with the ability to cover operator duties at other plants as needed.

It is anticipated that sewer maintenance for the County-owned collection system would be provided through intermunicipal agreements with the municipalities where the sewer is located. This would eliminate the need for a County-owned sewer maintenance crew and equipment for a minimal length of sewer.

Currently, fiscal operations for billing and payments are handled at each municipality’s office, separate from the treatment facility. It is proposed that the fiscal operations for the County-owned system would be taken over by the existing County Finance Department.

FIGURE 4-1

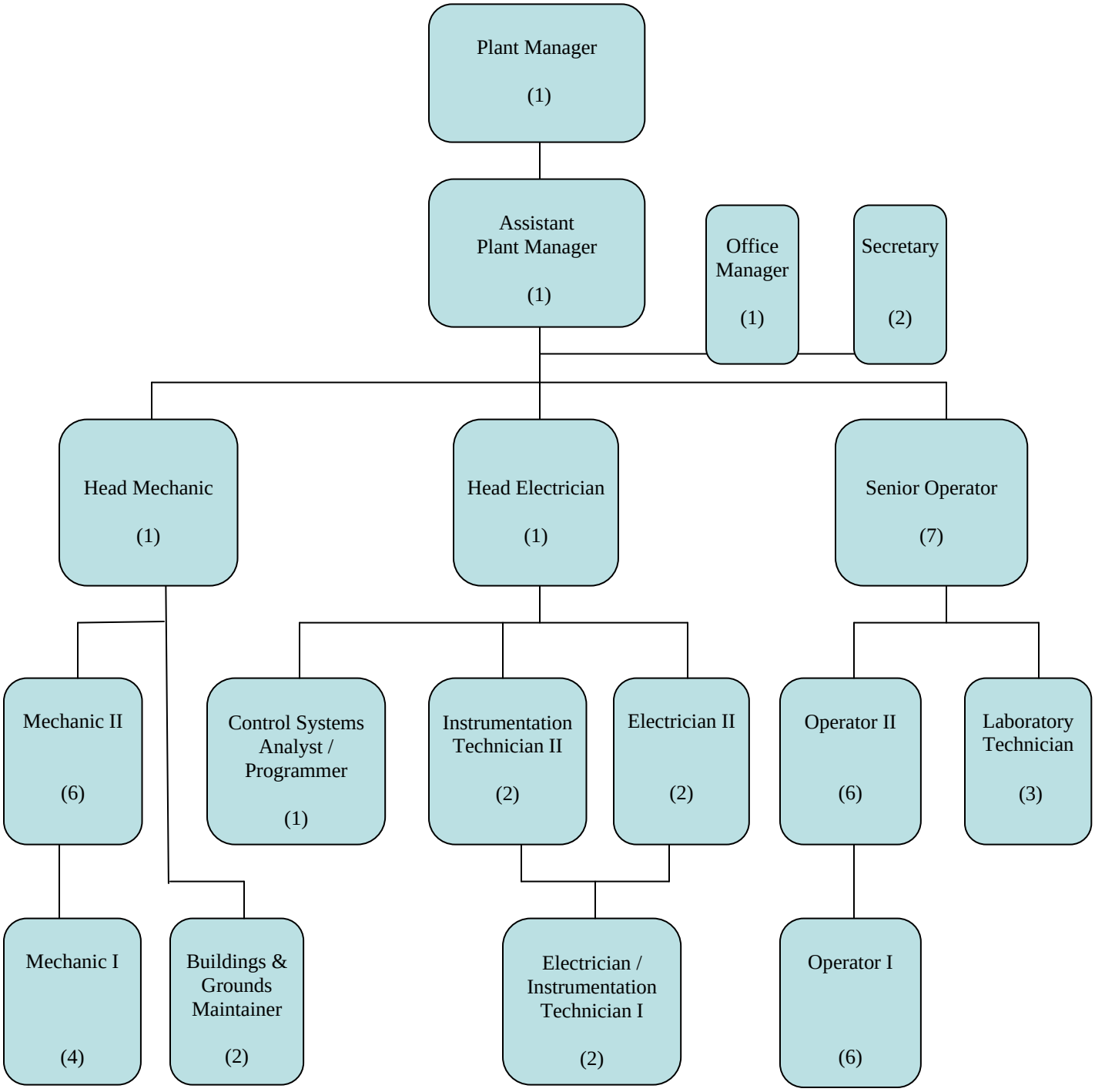
CURRENT ORGANIZATIONAL CHART FOR BINGHAMTON-JOHNSON CITY JOINT SEWAGE TREATMENT PLANT WITHOUT BAFs IN OPERATION




34 TOTAL STAFF

FIGURE 4-2

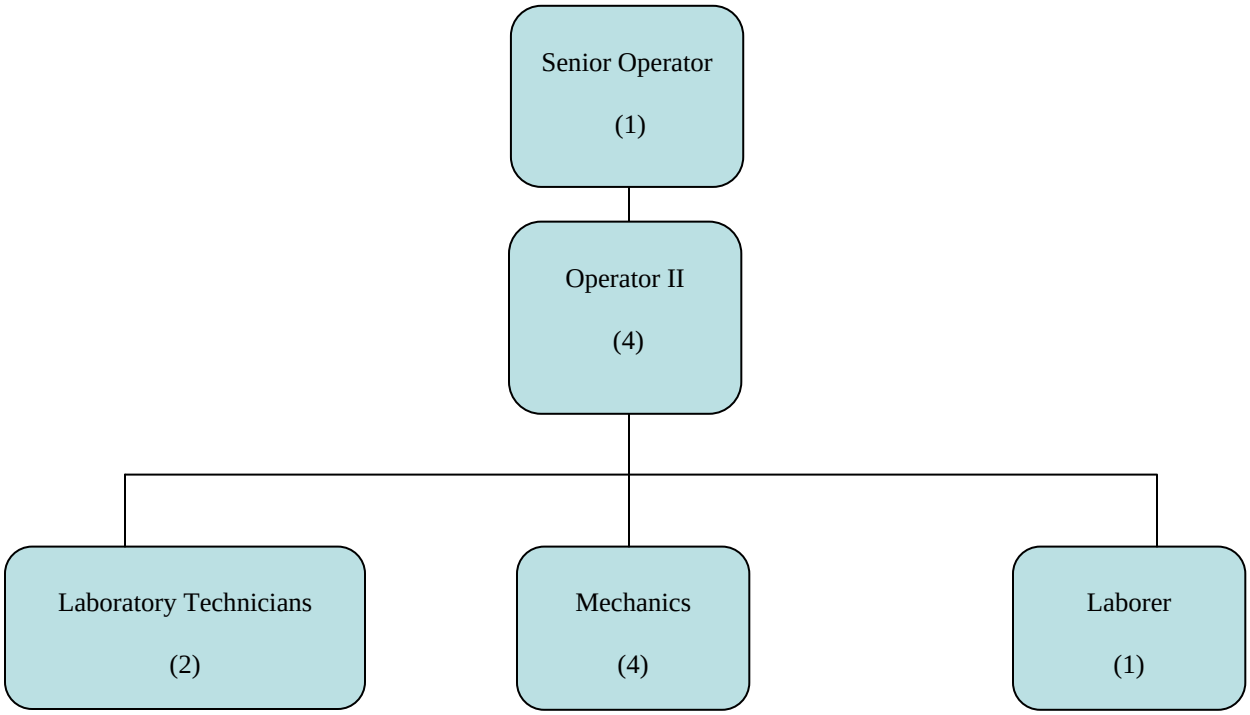
STAFFING CHART FOR BINGHAMTON-JOHNSON CITY
JOINT SEWAGE TREATMENT PLANT
(INCLUDES STAFF REQUIREMENTS FOR BAF UPGRADE)




48 TOTAL STAFF

FIGURE 4-3

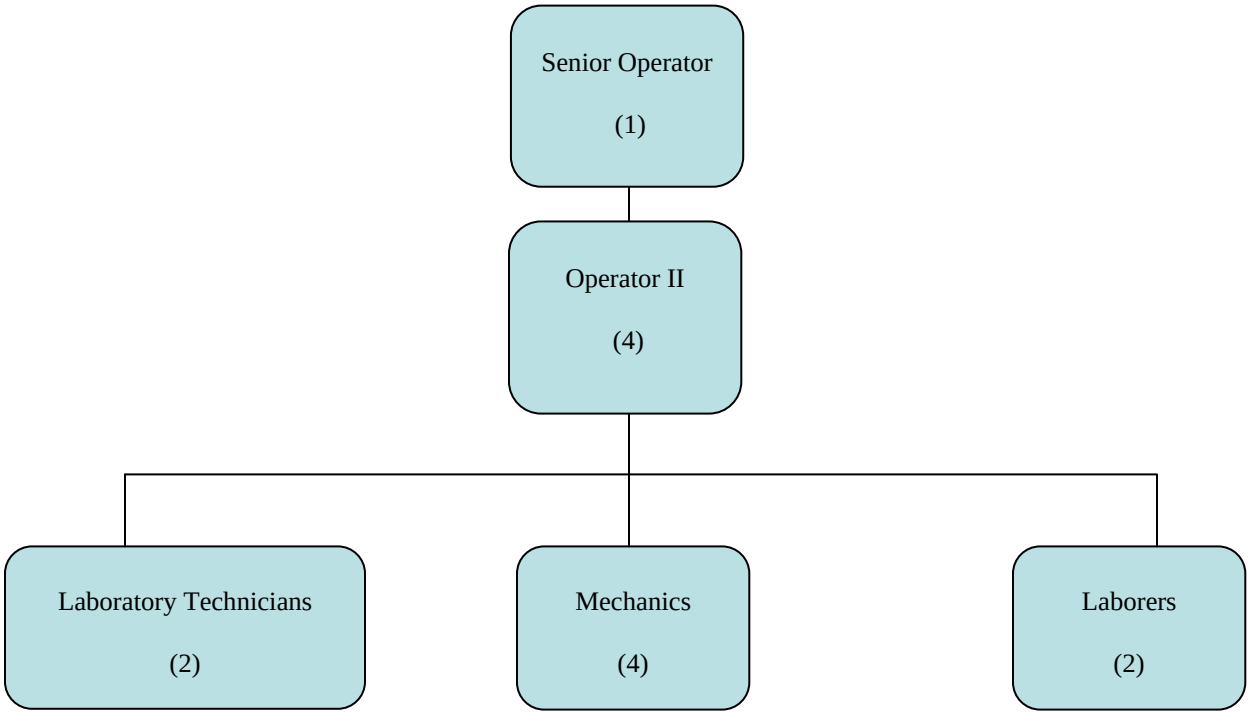
STAFFING CHART FOR CURRENT
ENDICOTT WASTEWATER TREATMENT PLANT




12 TOTAL STAFF

FIGURE 4-4

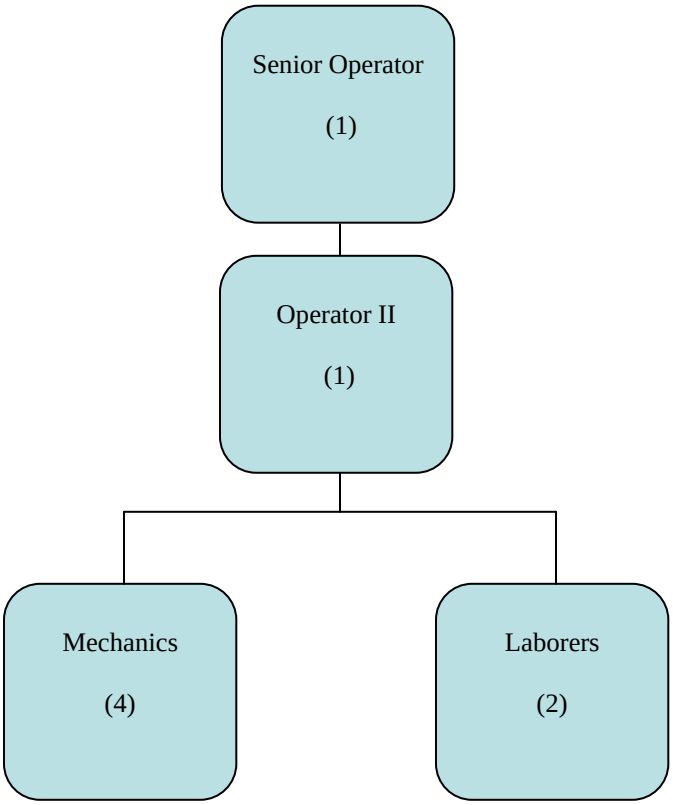
STAFFING CHART FOR ENDICOTT WASTEWATER TREATMENT PLANT
(INCLUDES PROJECTED STAFF FOR
FUTURE NUTRIENT REMOVAL UPGRADE)




13 TOTAL STAFF

FIGURE 4-5

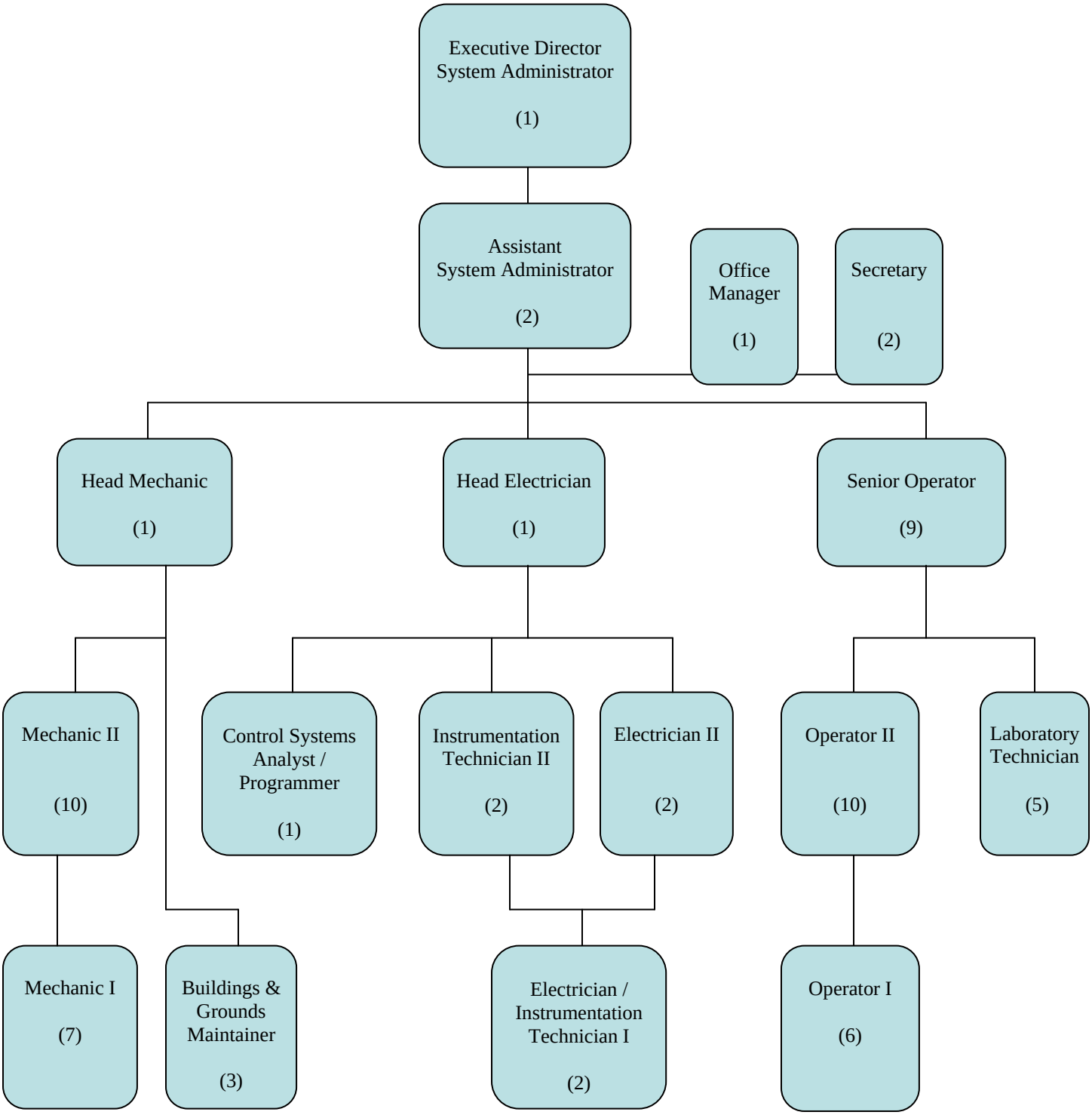
STAFFING CHART FOR NORTHGATE WASTEWATER TREATMENT PLANT




4 TOTAL STAFF

FIGURE 4-6

STAFFING CHART FOR COUNTY-OWNED SYSTEM
BINGHAMTON-JOHNSON CITY, ENDICOTT, AND NORTHGATE




65 TOTAL STAFF

# CHAPTER 5

# OWNERSHIP STRUCTURE

Generally, a county that seeks to consolidate the operation of multiple sewage facilities in its jurisdiction into a single, coherent and fiscally-responsible system has three regional management options. The county can: (1) form a County Sewer District; (2) establish a County Sewer Authority; or (3) cooperate with other municipal corporations to jointly provide sewer services pursuant to an inter-municipal agreement. The following is an overview of the structure of each of these options, a summary of the procedures necessary to implement each option and an outline of the powers of the governmental entity established by each option.

## 5.1 COUNTY SEWER DISTRICT

The County may establish a county sewer district pursuant to Article 5A of the New York State County Law to remove sewage from municipalities and provide for its treatment and disposal. Section 251 of the County Law authorizes the board of supervisors (or county legislature, as applicable) to establish an officer, board or body to act "as a county water, water quality treatment, sewer, wastewater disposal, drainage, [or] refuse . . . agency."[1, 2] A sewer district is therefore an agency of the County and is not an independent political entity. Section 251 also authorizes the board of supervisors to determine all matters relating to the membership of such an agency, including, but not limited to, the number of members, method by which members are selected, as well as the tenure, qualifications and compensation of members.

The County Law provides that the boundaries of a county sewer district may be established by the presentation of a petition to the board of supervisors requesting that a certain area of the county be included as part of the district. The petition must be executed and acknowledged by

[1] See Section 252(1), subsections 4 and 5.

[2] Section 150-a(2) of the County Law provides that, "Whenever the board of supervisors of a county is referred to or designated in any law, contract or document pertaining to any of the functions, powers, obligations and duties of such board, such reference or designation shall be deemed to include the elected county legislative body, by whatsoever name designated which, pursuant to law, or order or judgment of a court of competent jurisdiction, shall have been established in place of the board of supervisors." Therefore, for purposes of the County Law, the board of supervisors shall be deemed to include the Broome County Legislature.

the chief executive officer of any municipality that is included as part of the proposed district or by at least 25 owners of taxable realty property within the proposed district.[3] Upon the receipt of a petition or on its own motion, the county board of supervisors may direct the sewer district to prepare maps and plans of the project requested by or for the areas of the county designated in the petition.[4] Once prepared, the sewer district must transmit the maps, and plans as well as a report setting forth the district's recommendations to the board of supervisors.[5]

Upon receipt of the report and the maps and plans, the board of supervisors is required to hold a public hearing regarding the creation of the sewer district, including the proposed area encompassing the district.[6] After the public hearing, the board of supervisors must determine whether the proposed sewer district and its facilities are satisfactory and sufficient. If the board finds that the proposed facilities are adequate and appropriate, and addresses certain other issues, including whether the creation of the district is in the public interest and whether the allocation of the costs of the facilities are proportionally assessed, the board of supervisors may adopt a resolution approving the establishment of the district, which resolution is subject to permissive referendum.[7] It should also be noted that if the resolution approving the establishment of the sewer district proposes that the County finance its costs by the issuance of bonds or other types of debt, and if the average costs for similar types of districts and the cost of the proposed district to the typical property is higher than that estimated by the State Comptroller, the County must file an application to the State Department of Audit and Control and the State Comptroller must approve the creation of the district.[8]

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[3] Section 253 of the County Law.
[4] Id.
[5] Section 254(1) of the County Law.
[6] Section 101 of the County Law provides that a resolution of the board of supervisors which is subject to a permissive referendum shall not take effect until forty-five days after its adoption; nor unless it is approved by the affirmative vote of a majority of the qualified electors of the county voting on a proposition therefor, if within forty-five days after its adoption there be filed with the clerk of the board of supervisors a petition signed by qualified electors of the county in number of not less than ten per centum of the total vote cast for governor in said county at the last general election held for the election of state officers. ("Qualified electors" generally means a person who has the qualifications prescribed for electors by the state constitution and law, and who is registered as may be required by law. In this case, the qualified electors would include all registered voters in the county.) Within thirty days after the adoption of a resolution which is subject to a permissive referendum, the board of supervisors may of its own motion by resolution provide that such resolution be submitted to a vote of the qualified electors of the county to be held at a general or special election held not less than sixty days after the adoption of the resolution providing for such special or general election. Such a proposition shall be submitted at the next general election of state or county government officers held in such county not less than sixty days after the filing of the petition requesting the referendum unless otherwise indicated.
[7] Id.
[8] Section 258(1) of the County Law.

A county sewer district is statutorily authorized to assemble data relating to the sewage collection, conveyance, treatment, and disposal problems of the County, and the problems of collection, conveyance, and disposal or storm water and other waters. The County Law further provides that such a district, when authorized by the board of supervisors, may also obtain state aid for comprehensive studies and reports. In addition, with the approval of the board of supervisors, the sewer district may render engineering and technical services for municipalities located within the County.

## 5.2 COUNTY SEWER AUTHORITY

A local sewer authority may be established pursuant to Title 8-A of the Public Authorities Law (New York State Local Water and Sewer Authorities Act)[9]. As with all public authorities, a special act of the New York State Legislature is required in order to create a sewer authority. The legislation contains the location and boundaries of the area or areas covered by the authority, the number of board of directors as well as the process by which board members will be appointed by certain specified municipal entities involved in the creation of the authority, and the powers and responsibilities of the authority. The powers of a local sewer authority include:

1. Borrow money and issue negotiable or non-negotiable notes, bonds, or other obligations;

2. Enter into contracts and to execute all instruments necessary or convenient or desirable for the purposes of the authority to carry out any powers expressly given it;

3. Acquire real or personal property by purchase, gift, grant, transfer, contract or lease or by condemnation pursuant to the eminent domain procedure law;

4. Construct, improve or rehabilitate sewerage facilities required for the maintenance, development or expansion of sewerage facilities;

5. Construct, improve or rehabilitate distribution, transmission, and sewerage facilities;

[9] Section 1196-a, et. seq. of the Public Authorities Law.

6. Operate and manage and to contract for the operation and management of facilities constructed by the authority;

7. Enter into contracts, with municipalities for the collection, treatment and disposal of sewage;

8. Apply to the appropriate agencies and officials of the federal, state and local governments for licenses, permits or approvals of its plans or projects;

9. Appoint officers and employees and fix and determine their qualifications, duties and compensation, and to retain or employ counsel, auditors, engineers and private consultants on a contract basis or otherwise for rendering professional or technical services and advice;

10. Enter upon such lands, waters, or premises for the purpose of making surveys, soundings, borings and examinations;

11. Apply for federal and state gifts or grants or loans of funds or property or financial or other aid;

12. Fix rates and collect charges for the use of the authority sewerage facilities;

13. Enter into cooperative agreements with other authorities, municipalities, counties, towns, villages, water districts, utility companies, individuals, firms or corporations, for the interconnection of facilities, the exchange or interchange of services and commodities, and within the territorial limits of the district to enter into a contract for the construction and operation and maintenance of a sewerage system by the authority for any municipality having power to construct and develop a sewerage system;

14. Provide for the discontinuance or disconnection of the provision of sewerage service for non-payment of fees, rates, rents or other charges imposed by the authority; and

15. Do all things necessary, convenient or desirable to carry out its purposes and for the exercise of its powers. [10]

[10] 1196-d of the Public Authorities Law.

The State of New York currently has the following eight local sewer authorities in existence:

1. Alfred, Almond, Hornellsville Sewer Authority.
2. Buffalo Sewer Authority.
3. Cayuga County Water and Sewer Authority.
4. Livingston County Water and Sewer Authority.
5. Nassau County Sewer and Storm Water Finance Authority.
6. Rensselaer County Water and Sewer Authority
7. Wayne County Water and Sewer Authority
8. Wilton (Town of) Water and Sewer Authority.

## 5.3 INTERMUNICIPAL AGREEMENTS

The County may also enter into agreements with other municipal corporations or districts to perform their respective functions, powers or duties on a cooperative, joint, or contract basis for the completion of any sewage project pursuant to Article 5-G of the General Municipal Law.[11] Such an agreement would contain provisions concerning the voting power of the parties, the manner in which the rates are established and debt is incurred, the allocation of revenues and financing the capital and operating costs, and the ownership of the facilities. The municipal corporations or districts must be able to independently perform any of the services or projects included in any intermunicipal cooperation agreement in order to perform them on a cooperative basis. In addition, any agreement entered into pursuant to Article 5-G must be independently approved by each of the participating municipalities.

## 5.4 FINANCING OF CITY-ACQUIRED MUNICIPAL SYSTEMS

The County, on behalf of a county sewer district or a local sewer authority, has the power to issue bonds to acquire municipal sewer systems. Such bonds may be issued in any amounts such entity determines to be necessary to pay the cost of any sewer project or projects, including the acquisition of municipal sewer assets. Any debt issued by the County on behalf of a county sewer district will be the debt of the County. Any debt issued by an authority will be considered to be authority debt and not the debt of any other municipal entity.

[11] Section 119-o of the General Municipal Law.

Bonds issued by the County will be general obligations secured by the faith and credit of the County. Bonds issued by an authority, however, may be general obligations secured by the faith and credit of the authority or may be special obligations payable solely out of particular revenues or other moneys of the authority. In the event the County or an authority issues debt to finance the cost of the acquisition of municipal sewer assets and the municipalities use such payment to retire existing debt, the municipal ratepayers may receive certain financial benefits. Such benefits include any debt issued by the County or authority having a longer term than the current outstanding debt which may lower the annual debt service cost, as well as prevailing interest rates which may be lower than the interest rates on the outstanding bonds. This could result in an overall cost savings to the municipal ratepayers.

## 5.5 ENTERPRISE FUND

A municipality, sewer district or public authority may choose to establish an enterprise fund in order to separate the revenues and expenditures of the service provided into a separate fund with its own financial statements, rather than to commingle it with the revenues and expenses of other governmental activities. An enterprise fund establishes a separate accounting and financial reporting mechanism for municipal services for which a fee is charged in exchange for goods or services.[12]

Enterprise accounting allows a municipal entity to demonstrate to the public the portion of total costs of a service that is recovered through user charges and the portion that is subsidized by the tax levy or other available funds, if any.[13] A municipal entity may choose to recover total service costs through user charges, but it is not required. Enterprise funds frequently are used to account for services whose costs are only partially funded by fees and charges.[14]

Establishing an enterprise does not create a separate or autonomous entity from the municipal government operation, and a municipal department or district operating an enterprise service is required to continue to fulfill financial and managerial reporting requirements like every other department or district.

[12] See Sections 2 and 70 of the State Finance Law.
[13] Massachusetts Department of Revenue Division of Local Services, Enterprise Funds, June 2002.
[14] Id.

## 5.6 FEDERAL APPROPRIATIONS – FINANCIAL ASSISTANCE

Through the federal appropriations process, Congress directs funding to numerous county and local governments for a wide variety of water and wastewater projects. One account in the EPA budget is of particular interest to many communities planning or building regional wastewater facilities. Each year, the Interior Appropriations bill has included funding for wastewater and stormwater infrastructure needs in the USEPA State and Tribal Assistance Grant account. Generally, these earmarks are in the $1 million to $3 million range and have a 45 percent local contribution requirement.

Examples include the attainment of over $50 million to be used in the planning and design of a regional water supply for a water planning district located in the southeast. In addition, over $5 million in USEPA grants were recently secured for planning and environmental review of a subregional, modern wastewater treatment project where seven older facilities were abandoned and three modern facilities will be constructed and/or upgraded. The County may wish to explore the federal appropriations process to offset the cost of the development of this project.

## 5.7 REVIEW OF WATER AND SEWER DISTRICT AND AUTHORITIES IN NEW YORK STATE

Appendix F is a review and summary of typical water and sewer districts and authorities in New York State. It is intended to provide an overview of the size and make-up of the boards of the existing districts and authorities in New York State and the various purposes served by each of those entities.

# CHAPTER 6

# RISK BENEFIT ANALYSIS

There are many positive and negative aspects to County acquisition of wastewater infrastructure. To reach a decision on what course of action the County should take, a risk benefit analysis needs to be performed to evaluate the significance of these positive and negative aspects. The following is a list of risk benefit analysis criteria and associated impacts that each item would have on the County.

## 6.1 CAPITAL COSTS

Capital costs represent the financial impact on the County associated with the acquisition of the WWTPs and collection systems in Broome County.

A. **No Action.**

*Benefits*:

- The County will incur no costs associated with the acquisition of wastewater infrastructure within the County. Therefore no capital will be needed and there will be no impact on the County's ability to borrow money for other potential County projects.

B. **County Acquisition of the BJCJSTP.**

*Risks:*

- The County will be required to pay an agreed-upon sum of money based on the assessed value of the BJCJSTP facilities, or they will take over payment of the current debt associated with these facilities to obtain ownership of them. This will impact the County's ability to borrow additional money for other projects that may require bonding to secure project funding.

C. **County Acquisition of the BJCJSTP and Endicott WWTP.**

*Risks:*

- The risks are the same as for acquisition of the BJCJSTP, plus the added risk associated with the additional cost of acquiring the Endicott WWTP.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Risks:*

- The risks are the same as for acquisition of the BJCJSTP and Endicott WWTP, plus the added risk associated with the additional cost of acquiring the Northgate WWTP.

The "No Action" option will provide the least amount of risk for the County for this risk benefit criteria, as the County will incur no cost or debt related to the acquisition of wastewater infrastructure.

## 6.2 USER COSTS

User costs represent the amount of money required as payment from each user to repay debt associated with wastewater collection and treatment and annual operation and maintenance costs of the system.

A. **No Action.**

*Risks:*

- Current sewer users within the Greater Binghamton Area would continue to pay widely varying user costs based on their local municipality and the wastewater treatment facility to which they are connected.

B. **County Acquisition of the BJCJSTP.**

*Risks:*

- There would be minimal change to the existing user costs, and the risk here would be similar to the "No Action" option above.

C. **County Acquisition of the BJCJSTP and Endicott WWTP**.

*Benefits:*

- User fees for all of the wastewater users in the BJCJSTP and Endicott WWTP service areas would become more consistent and stable due to the larger user base of the new combined system. New projects at the two wastewater treatment facilities would have a smaller impact on the overall user fees as the cost of each project would be spread out over all of the users.

- Based on the current user cost data, the BJCJSTP users would experience a reduction in user rates by combining the BJCJSTP and Endicott WWTP under the County as one entity. The costs of operating both facilities together would be distributed over the entire user base for the two facilities, thus lowering the user costs for the BJCJSTP users.

- Future user costs for Endicott WWTP users would be lower as the costs for future improvements would be shared among the BJCJSTP users.

*Risks:*

- Endicott wastewater facility users would experience an increase in user fees as they would be sharing the costs associated with BJCJSTP. By combining these two facilities together under County control, the Endicott WWTP user costs would increase when the capital and operation and maintenance cost for both facilities is combined and distributed among the Endicott and BJCJSTP users.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits:*

- User fees for all of the wastewater users in the Greater Binghamton Area would become more consistent and stable due to the larger user base of the new system. New projects at the three wastewater treatment facilities would have a smaller impact on the overall user fees as the cost of each project would be spread out over all of the users.

- Based on the current user cost data, the BJCJSTP users would experience a reduction in user rates by combining the BJCJSTP, Endicott WWTP, and the Northgate WWTP under the County as one entity. The costs of operating all three facilities together would be distributed over the entire user base of the Greater Binghamton Area, thus lowering the user costs for the BJCJSTP users.

- Future user costs for Endicott and Northgate WWTP users would be lower as the costs for future improvements would be distributed among all users, including BJCJSTP users.

*Risks:*

- The Endicott and Northgate WWTP users would experience an increase in user fees as they would be sharing in the costs associated with the BJCJSTP. By combining all three facilities under County control, the Endicott and Northgate user costs would increase when capital and operation and maintenance costs for all facilities is combined and distributed among all users in the Greater Binghamton area.

The greatest benefit would be achieved through County acquisition of all three of the wastewater treatment plants in the Greater Binghamton Area.

## 6.3 OPERATION AND MANAGEMENT

Operation and management represents the financial and administrative impacts that would result from County ownership of the various wastewater facilities. Management costs are associated with the labor cost for oversight of the owned treatment and collection systems. Operation costs include the labor, materials, and equipment costs associated with maintaining the owned treatment and collection systems

A. **No Action.**

*Benefits:*

- The County would not be required to bear the cost of operation and management of the acquire wastewater infrastructure. Operation and management of this infrastructure would add to the overall size of the county-level government. The

actual cost of this management system would be covered by the system users, but would require additional coordination at the county level.

*Risks:*

- Continued redundancy of effort and management tasks at each facility.

B. **County Acquisition of the BJCJSTP.**

*Risks:*

- The County would be required to take on the management and operation of the BJCJSTP. This would result in an increase in overall County staff, as it is anticipated that the existing operational staff for the BJCJSTP would become County employees. The actual cost of this management system would be covered by the system users, but would require additional coordination at the county level.

C. **County Acquisition of the BJCJSTP and Endicott WWTP.**

*Benefits:*

- The County would be able to improve the overall managerial and operational efficiencies of the two wastewater treatment facilities by gaining an economy of scale, especially at the upper management level. Additional examples of the economies that may be obtained through the management and operation of the two facilities would be the use of a single vehicle fleet (trucks and other heavy equipment could be shared among the facilities), one source of equipment purchasing as opposed to one for each wastewater treatment facility, as well as management and operation of a single inventory management system covering all of the facilities.

- The County would experience improved operational flexibility with the ability to transfer and shift available staff from one facility to the other, as necessary. This would also provide improved staff redundancy in the event that certain staff members were unavailable.

*Risks:*

- The risks are the same as for the acquisition of the BJCJSTP, plus the added risk of additional staff and coordination required by the Endicott WWTP.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits:*

- The benefits are the same as for the County acquisition of the BJCJSTP and Endicott WWTP, except that even more economy and flexibility would be gained with the inclusion of the Northgate WWTP.

*Risks:*

- The risks are the same as for the acquisition of the BJCJSTP and the Endicott WWTP, plus the added risk of additional staff and coordination required for the Northgate WWTP.

Acquisition of all three of the wastewater treatment plants in the Greater Binghamton Area would provide the greatest benefit for the County.

## 6.4 FUTURE COSTS

Future costs represent the costs the County could incur through ownership of the various wastewater facilities in the County. The current foreseeable costs associated with the wastewater facilities in Broome County are for the Chesapeake Bay Initiative upgrades. Other possible future costs could be associated with future WWTP, pumping station, CSO, or sewer work to improve, upgrade, or expand the existing facilities.

A. **No Action.**

*Benefits:*

- The County will incur no additional costs associated with the future costs of the Chesapeake Bay Initiative upgrades or any other wastewater infrastructure improvements required. Therefore, there will be no impact on the County's ability to borrow money for other potential County projects.

*Risks:*

- Each individual municipality will be responsible for the future cost to upgrade their facilities to meet the new permit limits.

B. **County Acquisition of the BJCJSTP.**

*Risks:*

- The County would need to pay for the expected wastewater treatment facility upgrades associated with the Chesapeake Bay Initiative at the Binghamton-Johnson City, Northgate, and Endicott wastewater facilities. This will potentially impact the County's ability to borrow additional money for other County projects.

C. **County Acquisition of the BJCJSTP and Endicott WWTP.**

*Benefits:*

- The County would be able to distribute the costs for the Chesapeake Bay Initiative upgrades at the BJCJSTP and Endicott WWTP among the larger user base being served by the two plants.

*Risks:*

- The risks are the same as for the acquisition of the BJCJSTP, plus the added risk of paying for future costs to upgrade the Endicott WWTP to meet the new permit limits.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs**

*Benefits:*

- The benefits are the same as for the County acquisition of the BJCJSTP and Endicott WWTP, except that the County would have an even larger user base to distribute the cost for the Chesapeake Bay Initiative.

*Risks:*

- The risks are the same as for the acquisition of the BJCJSTP and the Endicott WWTP, plus the added risk of paying for future costs to upgrade the Northgate WWTP to meet the new permit limits.

The “No Action” option will provide the least amount of risk for the County, as no future costs or debt would be incurred related to wastewater infrastructure upgrades or improvements.

## 6.5 ENVIRONMENTAL BENEFITS

Environmental benefits represent the positive environmental impacts resulting from County operation and management of the wastewater facilities in Broome County.

A. **No Action.**

*Risks:*

- Potential sewer users that are currently unable to connect to a wastewater treatment facility would continue to use on-site subsurface treatment systems, which are susceptible to failure and poor treatment performance.

B. **County Acquisition of the BJCJSTP**.

*Benefits:*

- The County will have the opportunity to provide new sewer connections to potential users not currently connected to the BJCJSTP. These new connections would replace existing individual on-site subsurface treatment systems (septic systems) that are susceptible to failure and poor treatment performance.

C. **County Acquisition of the BJCJSTP and Endicott WWTP.**

*Benefits:*

- Similar to the benefit of acquiring the BJCJSTP, acquisition of the Endicott WWTP will further improve the County’s ability to provide new sewer connections to potential users in the BJCJSTP and Endicott WWTP Service Areas not currently connected to a wastewater treatment facility.

- Consolidating the BJCJSTP and the Endicott WWTP under the County's control will improve the consistency and continuity of overall facilities’ operations and management, which could subsequently improve the overall treatment performance at these facilities through increase depth of operation and maintenance experience.

- A County controlled system in the BJCJSTP and Endicott WWTP service areas will provide a greater user base to shoulder the costs of future environmentally beneficial improvements.

- A County controlled system in the BJCJSTP and Endicott WWTP service areas will assume greater environmental responsibility and be more likely to act consistently on environmental needs in the new wastewater district.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits:*

- The benefits are the same as were stated for the County acquisition of the BJCJSTP and Endicott WWTP, except that the County-controlled wastewater system would cover the entire Greater Binghamton Area.

The greatest benefit would be achieved through County acquisition of all three of the wastewater treatment plants in the Greater Binghamton Area.

## 6.6 GROWTH POTENTIAL

Growth potential represents the potential impacts that the County's ownership of wastewater facilities in Broome County will have on the marketability of the County, and the County's ability to attract potential growth.

A. **No Action.**

*Risks:*

- The County will continue to be impeded in promoting economic growth in Broome County through a lack of flexibility in the County’s wastewater infrastructure. The County would continue to operate under the current situation, in which the County is unable to offer new sewer connections to attract potential growth without getting approval for the connections from the owner of the wastewater treatment facility that services that area.

B. **County Acquisition of the BJCJSTP.**

*Benefits:*

- The County will have the ability to offer sewer connections for potential development in the BJCJSTP service area. This would provide the County with improved flexibility for their planning and development goals within the County, and remove the need for sewer connections as a potential obstacle for attracting new development.

C. **County Acquisition of the BJCJSTP and Endicott WWTP.**

*Benefits*:

- The benefits are the same as for the County acquisition of the BJCJSTP with the added planning and development flexibility associated with ownership and operation of the Endicott WWTP. This would give the County a greater area for potential growth opportunities.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits*:

- The benefits are the same as for the County acquisition of the BJCJSTP and Endicott WWTP with the added planning and development flexibility associated with ownership and operation of the Northgate WWTP. This would give the County the ability to promote and control potential growth throughout the entire Greater Binghamton Area.

- This option provides the County with the greatest opportunity and flexibility for growth potential.

The County's growth potential will receive the greatest benefit from the acquisition of all three of the Greater Binghamton Area wastewater treatment plants.

## 6.7 FLOW SHARING

Flow sharing represents the impacts on improved wastewater capacity and flexibility by providing the ability to transfer wastewater within the County among the three Greater Binghamton Area WWTPs.

A. **No Action**.

*Risks*:

- The County would continue to be limited in their options for potential growth based on the available capacity at the existing wastewater treatment facilities, and the ability to come to an agreement with the municipality that owns that facility.

B. **County Acquisition of the BJCJSTP.**

*Risks*:

- The County would be required to reach an agreement with the Village of Endicott or the Town of Chenango in order to develop any flow sharing system between the BJCJSTP and another treatment facility. This agreement would need to address the sharing of financial responsibilities as well as the operational and managerial responsibilities of such a system between that municipality and the County.

C. **County Acquisition of the BJCJSTP and Endicott WWTP.**

*Benefits:*

- The County would have a system capable of transferring or diverting wastewater flows from one wastewater facility to another in order to provide capacity for potential developments. This would provide the County with flexibility to offer a wide range of development projects within the BJCJSTP and Endicott WWTP service areas. The County would be able to offer wastewater treatment capacity for a location that currently could not support such a project by diverting flows from that system to an adjacent plant to allocate the necessary capacity.

*Risks*:

- The County would bear the financial burden associated with the installation and operation of a system for sharing flow between the BJCJSTP and the Endicott WWTP. This may require a significant construction project or multiple projects that could further impact the County's financial situation through bonding for such projects.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits*:

- The County would have a system capable of transferring or diverting wastewater flows from one wastewater facility to another in order to provide capacity for potential developments. This would provide the County with flexibility to offer a wide range of development projects within the Greater Binghamton Area. The County would be able to offer wastewater treatment capacity for a location that currently could not support such a project by diverting flows from that system to an adjacent plant to allocate the necessary capacity.

*Risks*:

- The County would bear the financial and logistical burdens associated with the installation and operation of a system for sharing flow between the Greater Binghamton Area wastewater treatment facilities. This may require a significant construction project or multiple projects that could further impact the County's financial situation through bonding for such projects.

Acquisition of all three of the Greater Binghamton Area wastewater treatment plants would provide the County with the most flexibility in terms of flow sharing options.

## 6.8 RATE STANDARDIZATION

Rate standardization represents the impacts that County ownership of wastewater facilities will have on standardization of wastewater treatment user fees charged to the individual end users within Broome County.

A. **No Action**.

*Risks:*

- No change. The current range of user fees being levied against the system users would remain in place, aside from any modifications to these fees as implemented by the municipality in charge of that system.

B. **County Acquisition of the BJCJSTP.**

*Benefits:*

- Rates could be standardized throughout the BJCJSTP service area, thus eliminating the existing discrepancy between user rates paid by the different users from the various municipalities.

C. **County Acquisition of the BJCJSTP and Endicott WWTP**

*Benefits:*

- The benefits are the same as were stated for the County acquisition of the BJCJSTP in addition to the ability to standardize rates throughout the BJCJSTP and the Endicott WWTP service areas, thus eliminating the existing discrepancy between user rates paid by the different users from the various municipalities serviced by these facilities.

*Risks*:

- The Endicott WWTP users would pay higher user rates than they are currently required to pay. This is due to the fact that the BJCJSTP users currently pay higher user rates, and under the combined billing system, the standardized user rate would be higher than those currently paid by the Endicott WWTP users.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits:*

- The benefits are the same as stated for the County acquisition of the BJCJSTP and Endicott WWTP, except with the addition of the Northgate WWTP; the County will have the ability to standardize rates throughout the Greater Binghamton Area. This

will eliminate the existing discrepancy between user rates paid by the different users from the various municipalities serviced by these facilities.

*Risks:*

- The risks are the same as for the acquisition of the BJCJSTP and the Endicott WWTP, except with the addition of the Northgate WWTP, whose users would also experience a rate increase.

Acquisition of all three of the Greater Binghamton Area wastewater treatment plants would provide the County with the greatest capacity for rate standardization, and would also provide the wastewater system users with the most stable user fees possible, as the County's system-wide wastewater expenses could be spread out among the largest number of users.

## 6.9 PLANT CAPACITY

Plant capacity represents the available capacity for new sewer connections at the various wastewater treatment facilities being considered by the County for acquisition. This factor directly impacts growth potential and flow sharing options.

A. **No Action**. No change.

B. **County Acquisition of the BJCJSTP.**

*Benefits:*

- Based on information available from the BJCJSTP Discharge Monitoring Reports (DMRs), the treatment plant appears to have hydraulic capacity. This would allow the County to accept new flows, and therefore, promote development within this service area.

*Risks:*

- Given the current construction being completed at the BJCJSTP it is not clear what the treatment capacity will be for this facility, or whether any additional plant capacity is available here. This information will need to be obtained through the Joint Sewage Board from their Engineer.

C. **County Acquisition of the BJCJSTP and Endicott WWTP**.

*Benefits:*

- The benefits are the same as stated for the County acquisition of the BJCJSTP.

*Risks:*

- The same risks apply here as for the acquisition of the BJCJSTP. In addition, the Endicott WWTP is very close to its NYSDEC permitted capacity on a flow basis and does not appear to have significant capacity for new users.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits:*

- The benefits are the same as stated for the County acquisition of the BJCJSTP.

*Risks:*

- The risks are the same as for the acquisition of the BJCJSTP and the Endicott WWTP. In addition, the Northgate WWTP is very close to its NYSDEC permitted capacity on a flow basis and does not appear to have significant capacity for new users.

Based on the available information, the BJCJSTP appears to be the only wastewater treatment plant of the three that were evaluated that has any appreciable capacity. Therefore, the County would receive the greatest benefit in terms of plant capacity by acquiring only the BJCJSTP.

## 6.10 PLANT EXPANDABILITY

Plant expandability represents the ease by which each wastewater treatment facility could be expanded to handle additional wastewater flows given the footprint of the existing wastewater treatment facility, the available free space on the site to construct new structures, and the current treatment process employed at each facility.

A. **No Action**. No change.

B. **County Acquisition of the BJCJSTP.**

*Risks*:

- The BJCJSTP has limited site space available, and the County would need to acquire additional land adjacent to the plant or adjust current operations to free up existing site space for new construction.

C. **County Acquisition of the BJCJSTP and Endicott WWTP.**

*Risks*:

- The risks are the same as for the acquisition of the BJCJSTP. In addition, the Endicott WWTP has limited undeveloped space available on the site. What space is currently available will potentially be utilized for an upgrade related to the Chesapeake Bay Initiative.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits:*

- Currently, a significant portion of the Northgate WWTP site is taken up by onsite composting operations for solids handling at the plant. If the County chose to modify their current method of solids handling, the space occupied by the composting facility could be cleared and used to expand the treatment capacity of the plant.

*Risks*:

- The risks are the same as for the acquisition of the BJCJSTP and the Endicott WWTP. In addition, the Northgate WWTP has limited site space available, and the County would need to acquire additional land adjacent to the plant, or adjust operations to free up existing site space for new construction.

The Endicott WWTP has some limited site space available for new construction, while the other two Greater Binghamton Area plants are essentially built out. Modification of the existing solids handling process at the Northgate WWTP would free up a significant portion of the existing site for potential plant expansion.

## 6.11 VALUE TO MUNICIPALITIES

Value to municipalities represents the impacts of County ownership of wastewater facilities on the municipalities themselves in terms of the responsibilities in the ownership, management, and operation of wastewater facilities.

A. **No Action.**

*Risks*:

- No change. The City of Binghamton, Village of Johnson City, Village of Endicott, and the Town of Chenango would be required to continue management and operation of their respective wastewater treatment facilities. There would be no value added to each of these municipalities in regards to a reduced level of municipal management and operation.

B. **County Acquisition of the BJCJSTP.**

*Benefits*:

- The City of Binghamton and the Village of Johnson City would be relieved of their obligations pertaining to the management and operation of the BJCJSTP, as well as selected sewer collection system components. This would reduce the level of management and operation needed from each municipality.

C. **County Acquisition of the BJCJSTP and Endicott WWTP**.

*Benefits*:

- The benefits are the same as were stated for the County acquisition of the BJCJSTP. In addition, the Village of Endicott would be relieved of their obligations pertaining to the management and operation of the Endicott WWTP, as well as selected sewer collection system components.

D. **County Acquisition of the BJCJSTP, Endicott, and Northgate WWTPs.**

*Benefits*:

- The benefits are the same as stated for the County acquisition of the BJCJSTP and the Endicott WWTP. In addition, the Town of Chenango would be relieved of their obligations pertaining to the management and operation of the Northgate WWTP, as well as selected sewer collection system components.

Acquisition of all three of the Greater Binghamton Area wastewater treatment plants would provide the most value to municipalities by relieving the most amount of obligation from the other municipalities in terms of operation and management of wastewater infrastructure.

## 6.12 SUMMARY

Based on the risk benefit criteria evaluated, the greatest overall benefit would be achieved for the County through the acquisition of all three existing Greater Binghamton Area WWTPs. This is evidenced by the fact that the majority of the risk benefit criteria showed the greatest value to the County by acquiring all three plants. In addition, the growth potential criteria, which is the basis for this report as defined by the County's Department of Planning and Economic Development, provides the most benefit to the County with the acquisition of all three plants, as this would allow the County to provide wastewater capacity for potential growth throughout the Greater Binghamton Area.

# CHAPTER 7

## SUMMARY AND CONCLUSIONS

The Broome County Department of Economic Planning and Development has identified potential growth areas in the Greater Binghamton Area. To further promote growth in these areas and consolidate municipal services, the County is evaluating obtaining ownership of wastewater treatment facilities and collection systems that service this area. The wastewater facilities include the BJCJSTP, Endicott WWTP, and the Northgate WWTP; and the collection systems include portions of the main interceptor sewers to each facility.

The BJCJSTP is the largest of the three facilities, followed by the Endicott WWTP, and the Northgate WWTP. Given the analysis of the three wastewater treatment facilities' current SPDES permits and their last three years of DMR data, the only plant that would be capable of accepting additional flow is the BJCJSTP. Based on the information gathered regarding current plant capacities, the County will need to consider increasing the capacity of the Endicott and Northgate WWTPs if they chose to acquire these facilities.

If the County chooses to acquire two or three of the WWTPs in the Greater Binghamton Area, consideration may be given to a flow sharing system between the facilities to provide the County with additional treatment flexibility. This would conceptually allow the County to promote growth in a larger area with the ability to transfer flow from the wastewater treatment facility servicing that growth area to another facility with greater treatment capacity. The flow sharing system would consist of new gravity sewers to connect the treatment facility service areas, or construction of bi-directional force mains connecting two different pumping stations, allowing flows to be transferred from one collection system to another. The County-wide and Greater Binghamton Area maps included in Appendix A contain a conceptual layout of proposed interceptor sewers and force mains that would be required to be owned or constructed by Broome County in order to develop flow sharing in this area.

There are three general options available to the County in terms of ownership structure if they proceed with acquisition of wastewater infrastructure: (1) establishment of a County Sewer District; (2) establishment of a County Sewer Authority; or (3) use of intermunicipal agreements. Selection of ownership structure must be determined by Broome County officials in

consideration of the financial borrowing power of the County and desired level of power and authority.

Based on the information gathered and presented during this study, it is recommended that the County proceed with the following implementation steps prior to ultimately deciding to proceed with ownership of the wastewater systems in the Greater Binghamton Area:

1. Discuss range of price to be paid to each municipality to determine willingness to sell, and starting point for purchase price negotiations.

2. Determine what ownership structure is preferred by County officials to take over the management, operation, and ownership of the wastewater systems in the Greater Binghamton Area.

3. Conduct a detailed evaluation and cost analysis for additional infrastructure and improvements required for flow sharing between treatment facilities.

4. Perform a plant capacity analysis for the Endicott and Northgate WWTPs to determine future plant expansion costs that are in addition to upgrade costs to meet the Chesapeake Bay Initiative.

5. Conduct a comprehensive financial analysis of Broome County to determine the borrowing power of the County and the payment terms for purchasing one or all three treatment systems.

6. Perform a user rate study based on the financial terms of actual monies to be borrowed for purchase of the wastewater systems.

7. Conduct a study to more accurately assess the options and costs for addressing wastewater expansion in the Town of Kirkwood and the Airport Corridor.

The findings of this report are summarized in Table 7-1.

# TABLE 7-1

## COST SUMMARY ANALYSIS
## YEAR CONSTRUCTED DOLLAR VALUE

| Parameter | | BJCSTP | | BJCSTP Endicott WWTP | | BJCSTP Endicott WWTP Northgate WWTP [11] | | BJCSTP Endicott WWTP Northgate WWTP Kirkwood & Airport Corridor Expansions (Greater Binghamton Area) [11] | |
|---|---|---|---|---|---|---|---|---|---|
| | | WWTP Only | WWTPs, PSs, and Main Collector Sewers | WWTPs Only | WWTPs, PSs, and Main Collector Sewers | WWTPs Only | WWTP, PSs, and Main Collector Sewers | WWTPs Only | WWTP, PSs, and Main Collector Sewers |
| Capital Costs [1] | | $53,000,000 | $62,000,000 | $62,000,000 | $72,000,000 | $66,000,000 | $76,000,000 | $66,000,000 | $76,000,000 |
| Debt [2] | | $60,000,000 | $68,000,000 | $68,000,000 | $76,000,000 | $70,000,000 | $78,000,000 | $70,000,000 | $78,000,000 |
| Future Costs [3] | | $13,000,000 | $13,000,000 | $29,000,000 | $29,000,000 | $30,000,000 | $30,000,000 | $48,000,000 | $48,000,000 |
| Management & Operation | | -- | -- | -- | -- | -- | -- | -- | -- |
| - Current Costs | | $6,200,000 | $6,800,000 | $8,200,000 | $8,800,000 | $8,600,000 | $9,200,000 | $8,600,000 | $9,200,000 |
| - Future Costs [4] | | $6,900,000 | $7,500,000 | $9,800,000 | $10,400,000 | $10,300,000 | $10,900,000 | $11,000,000 | $11,600,000 |
| Number of Users [5] | | 27,405 | | 44,775 | | 47,175 | | 47,175 [12] | |
| 20-Year Financing [6] | Future User Costs (Capital Costs) [9] | $440 | $490 | $380 | $410 | $380 | $410 | $430 | $460 |
| | Future User Costs (Debt Takover) [10] | $470 | $510 | $390 | $420 | $390 | $410 | $430 | $460 |
| 30-Year Financing [7] | Future User Costs (Capital Costs) [9] | $390 | $430 | $340 | $360 | $340 | $360 | $370 | $400 |
| | Future User Costs (Debt Takover) [10] | $410 | $440 | $340 | $370 | $340 | $360 | $380 | $400 |
| 40-Year Financing [8] | Future User Costs (Capital Costs) [9] | $390 | $430 | $340 | $360 | $340 | $360 | $370 | $400 |
| | Future User Costs (Debt Takover) [10] | $410 | $450 | $350 | $370 | $340 | $360 | $380 | $400 |

Notes:

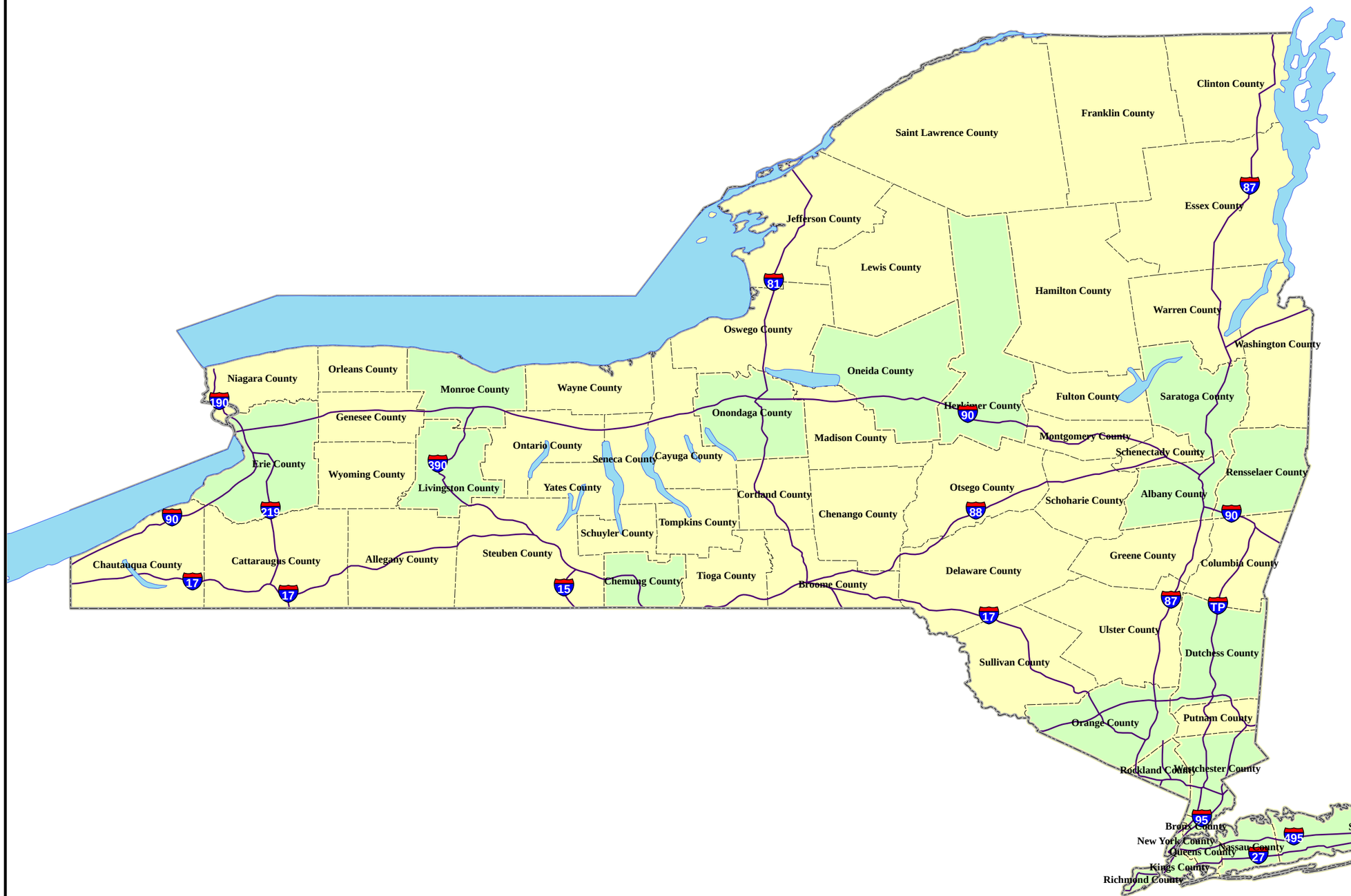
1. Capital costs represent the estimated value of the existing wastewater infrastructure.
2. It has been anticipated that any debt that may be outstanding for the Towns of Dickinson and Vestal sewer collection systems would be negligible as they pertain to the specific lines that have been identified for potential ownership and operation by the County under the "WWTPs, PSs, & Main Collector Sewers" scenario.
3. "Future Costs" represent the estimated cost to upgrade the WWTPs to meet the effluent requirements of the upcoming Chesapeake Bay Initiative.
4. "Future Costs" for the Management & Operation represents the estimated increase in the annual O&M costs based on the expected Chesapeake Bay Initiatve upgrades. The value listed is the sum of the "Current Costs" value plus the future costs. The additional Endicott O&M costs are based on data from the "Nutrient Removal Assessment for the Village of Endicott Wastewater Treatment Plant" October 2005 Report completed by Stearns & Wheler, LLC. The Binghamton-Johnson City Joint STP and the Northgate WWTP future cost increases have been estimated using ratios of the 2006 annual average plant flows for these plants to that of the Endicott WWTP.
5. "Number of Users" represents the actual number of sewer users or connections that are billed by their respective municipality for use of the sewer system. Numbers were obtained from each municipality. Number of users does not include households that are not currently connected to the sewer system.
6. 20-year financing is based on general bonding at an estimated interest rate of 5%.
7. 30-year financing is based on bonding through NYS Environmental Facilities Corporation at an estimated interest rate of 4%.
8. 40-year financing is based on federal bonding at an estimated interest rate of 5%.
9. "User Costs" are based on stated Capital Costs, Management & Operation, and Future Costs. "User Costs" do not include other non-County owned infrastructure that continue to be operated & financed by the individual municipalities.
10. "User Costs" are based on stated Debt , Management & Operation, and Future Costs. "User Costs" do not include other non-County owned infrastructure that continue to be operated & financed by the individual municipalities.
11. This section does not include the Pennview Package WWTP in the Town of Chenango.
12. Additional users associated with the expansions in the Town of Kirkwood and the Airport Corridor have not been included with this number as there currently are no available estimates for the number of new users that may be added.

Note: Separate costs for each facility are presented in Chapters 2 and 3.

# APPENDICES

# APPENDIX A

## FIGURES




| COUNTY-MANAGED WW Treatment & Collection Systems |
|---|
| Albany |
| Bronx |
| Chemung |
| Dutchess |
| Erie |
| Herkimer |
| Kings |
| Livingston |
| Monroe |
| Nassau |
| New York |
| Oneida |
| Onondaga |
| Orange |
| Queens |
| Rensselaer |
| Richmond |
| Rockland |
| Saratoga |
| Suffolk |
| Westchester |

1 inch equals 37.88 miles

0 10 20 40 60 80 Miles

Major Lakes

County-Managed WW Treatment and Collection Systems

County Border

S&W Project No. 61099

2007

GIS Tech.: DAO

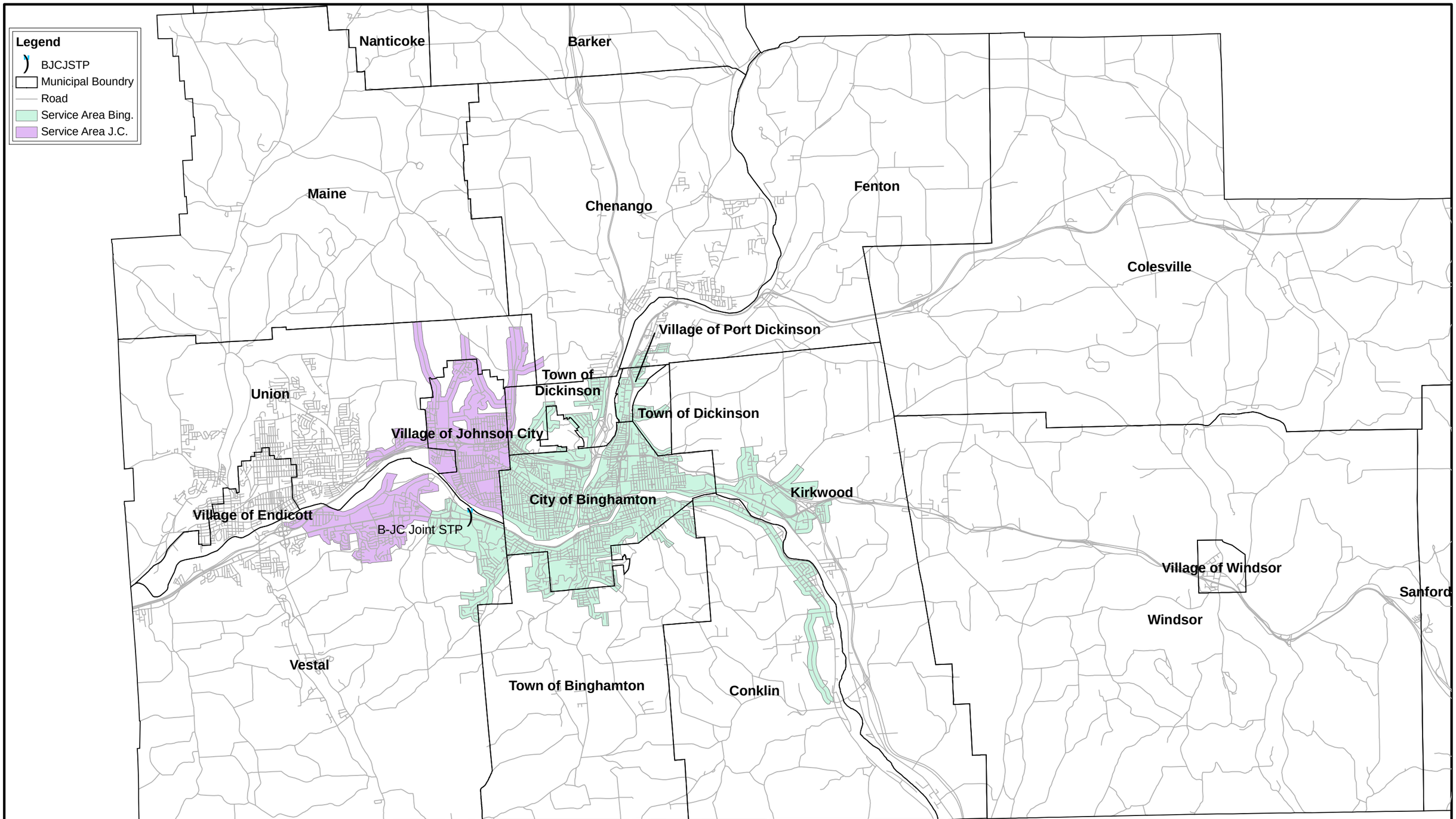
Proj. Mgr: PMP

Stearns & Wheler, LLC
Environmental Engineers and Scientists

Filename & Path: J:\GIS\Broome County\Maps\NY-County Managed WW-11x17.mxd

N

# NEW YORK STATE
# COUNTY-MANAGED WASTEWATER TREATMENT AND COLLECTION SYSTEMS




Scale: 1 inch equals 2 miles

0 0.5 1 2 3 Miles

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S&W Project No. 61099
GIS Tech.: NJH
Proj. Mgr: JDG

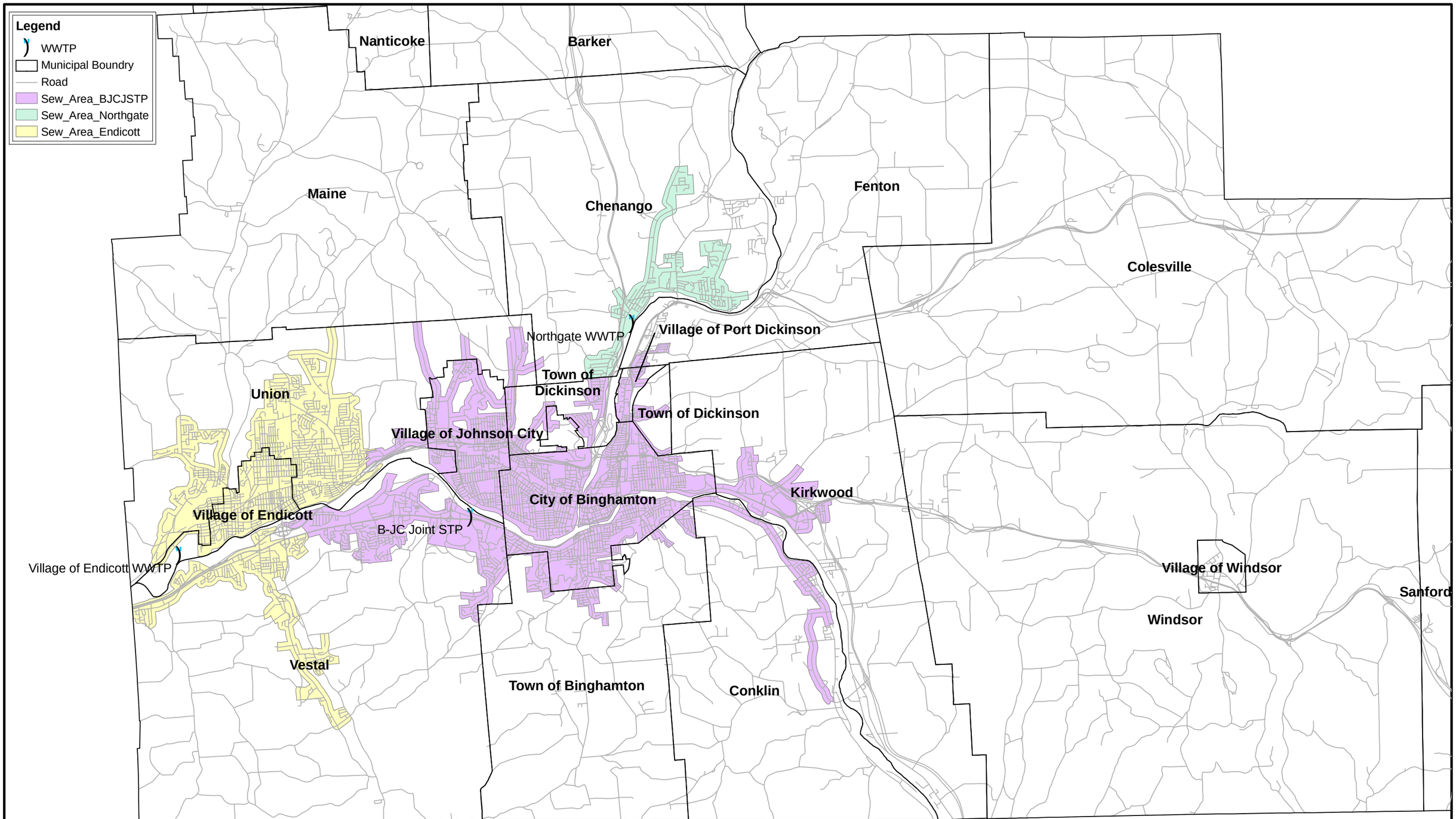
Stearns & Wheler, LLC
Environmental Engineers and Scientists

October 2007

Department of Planning and Economic Development

# Broome County Financial Feasibility Study

## BJCJSTP SERVICE AREAS MAP




Scale: 1 inch equals 2 miles

0 0.5 1 2 3 Miles

Filename & Path: J:\GIS\Broome County\Maps\NJH BC County Sew Areas -11x17.mxd

S&W Project No. 61099
GIS Tech.: NJH
Proj. Mgr: JDG

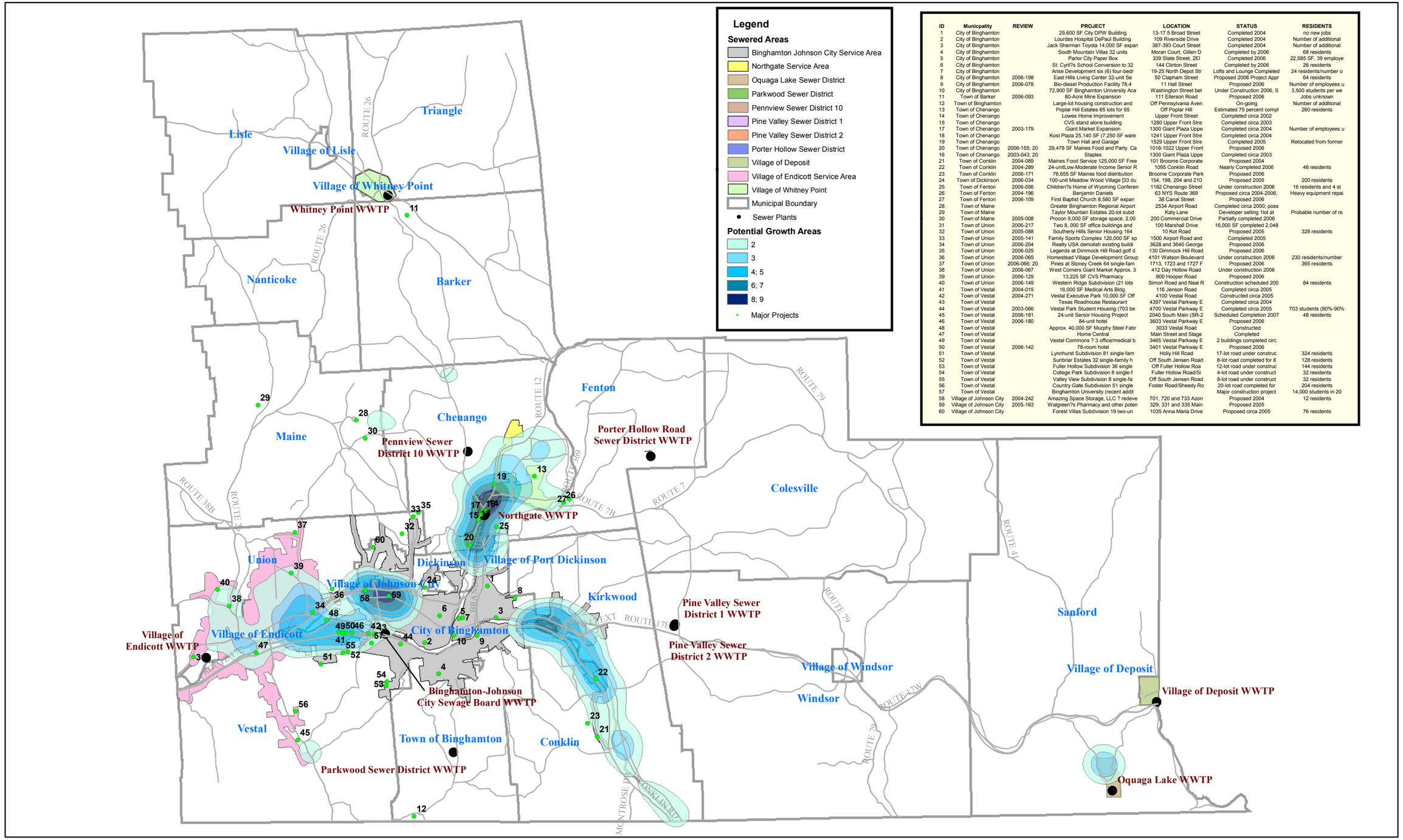
Stearns & Wheler, LLC
Environmental Engineers and Scientists

October 2007

Department of Planning and Economic Development

# Broome County Financial Feasibility Study

## COUNTY SERVICE AREAS MAP




| ID | Municipality | REVIEW | PROJECT | LOCATION | STATUS | RESIDENTS |
|---|---|---|---|---|---|---|
| 1 | City of Binghamton | | 29,600 SF City DPW Building | 13-17.5 Broad Street | Completed 2004 | no new jobs |
| 2 | City of Binghamton | | Lourdes Hospital DePaul Building | 109 Riverside Drive | Completed 2004 | Number of additional |
| 3 | City of Binghamton | | Jack Sherman Toyota 14,000 SF expan | 387-393 Court Street | Completed 2004 | Number of additional |
| 4 | City of Binghamton | | South Mountain Villas 32 units | Moran Court, Gillen D | Completed by 2006 | 68 residents |
| 5 | City of Binghamton | | Parlor City Paper Box | 339 State Street, 2El | Completed 2006 | 22,585 SF, 39 employe |
| 6 | City of Binghamton | | St. Cyril?s School Conversion to 32 | 144 Clinton Street | Completed by 2006 | 26 residents |
| 7 | City of Binghamton | | Arise Development six (6) four-bedr | 19-25 North Depot Str | Lofts and Lounge Completed | 24 residents/number o |
| 8 | City of Binghamton | 2006-198 | East Hills Living Center 32-unit Se | 50 Clapham Street | Proposed 2006 Project Appr | 64 residents |
| 9 | City of Binghamton | 2006-078 | Bio-diesel Production Facility 78,4 | 11 Hall Street | Proposed 2006 | Number of employees u |
| 10 | City of Binghamton | | 72,900 SF Binghamton University Aca | Washington Street bet | Under Construction 2006, S | 3,500 students per we |
| 11 | Town of Barker | 2006-093 | 80-Acre Mine Expansion | 111 Ellerson Road | Proposed 2006 | Jobs unknown |
| 12 | Town of Binghamton | | Large-lot housing construction and | Off Pennsylvania Aven | On-going | Number of additional |
| 13 | Town of Chenango | | Poplar Hill Estates 65 lots for 65 | Off Poplar Hill | Estimated 75 percent compl | 260 residents |
| 14 | Town of Chenango | | Lowes Home Improvement | Upper Front Street | Completed circa 2002 | |
| 15 | Town of Chenango | | CVS stand alone building | 1280 Upper Front Stre | Completed circa 2003 | |
| 17 | Town of Chenango | 2003-179 | Giant Market Expansion | 1300 Giant Plaza Uppe | Completed circa 2004 | Number of employees u |
| 18 | Town of Chenango | | Kost Plaza 25,140 SF (7,250 SF ware | 1241 Upper Front Stre | Completed circa 2004 | |
| 19 | Town of Chenango | | Town Hall and Garage | 1529 Upper Front Stre | Completed 2005 | Relocated from former |
| 20 | Town of Chenango | 2006-155; 20 | 29,478 SF Maines Food and Party Ca | 1018-1022 Upper Front | Proposed 2006 | |
| 16 | Town of Chenango | 2003-043; 20 | Staples | 1300 Giant Plaza Uppe | Completed circa 2003 | |
| 21 | Town of Conklin | 2004-089 | Maines Food Service 125,000 SF Free | 101 Broome Corporate | Proposed 2004 | |
| 22 | Town of Conklin | 2004-289 | 24-unitLow-Moderate Income Senior R | 1095 Conklin Road | Nearly Completed 2006 | 48 residents |
| 23 | Town of Conklin | 2006-171 | 76,655 SF Maines food distribution | Broome Corporate Park | Proposed 2006 | |
| 24 | Town of Dickinson | 2006-034 | 100-unit Meadow Wood Village [33 du | 154, 198, 204 and 210 | Proposed 2005 | 200 residents |
| 25 | Town of Fenton | 2006-056 | Children?s Home of Wyoming Conferen | 1182 Chenango Street | Under construction 2006 | 16 residents and 4 st |
| 26 | Town of Fenton | 2004-196 | Benjamin Daniels | 63 NYS Route 369 | Proposed circa 2004-2006, | Heavy equipment repai |
| 27 | Town of Fenton | 2006-109 | First Baptist Church 8,580 SF expan | 38 Canal Street | Proposed 2006 | |
| 28 | Town of Maine | | Greater Binghamton Regional Airport | 2534 Airport Road | Completed circa 2000; poss | |
| 29 | Town of Maine | | Taylor Mountain Estates 20-lot subd | Katy Lane | Developer selling 1lot at | Probable number of re |
| 30 | Town of Maine | 2005-008 | Procon 9,000 SF storage space, 2,00 | 200 Commercial Drive | Partially completed 2006 | |
| 31 | Town of Union | 2006-217 | Two 8, 000 SF office buildings and | 100 Marshall Drive | 16,000 SF completed 2,048 | |
| 32 | Town of Union | 2005-088 | Southerly Hills Senior Housing 164 | 10 Kot Road | Proposed 2005 | 328 residents |
| 33 | Town of Union | 2005-141 | Family Sports Complex 120,000 SF sp | 1500 Airport Road and | Completed 2005 | |
| 34 | Town of Union | 2006-204 | Realty USA demolish existing buildi | 3628 and 3640 George | Proposed 2006 | |
| 35 | Town of Union | 2006-025 | Legends at Dimmock Hill Road golf d | 130 Dimmock Hill Road | Proposed 2006 | |
| 36 | Town of Union | 2006-065 | Homestead Village Development Group | 4101 Watson Boulevard | Under construction 2006 | 230 residents/number |
| 37 | Town of Union | 2006-066; 20 | Pines at Stoney Creek 64 single-fam | 1713, 1723 and 1727 F | Proposed 2006 | 365 residents |
| 38 | Town of Union | 2006-067 | West Corners Giant Market Approx. 3 | 412 Day Hollow Road | Under construction 2006 | |
| 39 | Town of Union | 2006-129 | 13,225 SF CVS Pharmacy | 800 Hooper Road | Proposed 2006 | |
| 40 | Town of Union | 2006-149 | Western Ridge Subdivision (21 lots | Simon Road and Neal R | Construction scheduled 200 | 84 residents |
| 41 | Town of Vestal | 2004-015 | 16,000 SF Medical Arts Bldg. | 116 Jenson Road | Completed circa 2005 | |
| 42 | Town of Vestal | 2004-271 | Vestal Executive Park 10,000 SF Off | 4100 Vestal Road | Constructed circa 2005 | |
| 43 | Town of Vestal | | Texas Roadhouse Restaurant | 4397 Vestal Parkway E | Completed circa 2004 | |
| 44 | Town of Vestal | 2003-066 | Vestal Park Student Housing (703 be | 4700 Vestal Parkway E | Completed circa 2005 | 703 students (80%-90% |
| 45 | Town of Vestal | 2006-181 | 24-unit Senior Housing Project | 2040 South Main (SR-2 | Scheduled Completion 2007 | 48 residents |
| 46 | Town of Vestal | 2006-180 | 84-unit hotel | 3603 Vestal Parkway E | Proposed 2006 | |
| 48 | Town of Vestal | | Approx. 40,000 SF Murphy Steel Fabr | 3033 Vestal Road | Constructed | |
| 47 | Town of Vestal | | Home Central | Main Street and Stage | Completed | |
| 49 | Town of Vestal | | Vestal Commons ? 3 office/medical b | 3465 Vestal Parkway E | 2 buildings completed circ | |
| 50 | Town of Vestal | 2006-142 | 78-room hotel | 3401 Vestal Parkway E | Proposed 2006 | |
| 51 | Town of Vestal | | Lynnhurst Subdivision 81 single-fam | Holly Hill Road | 17-lot road under construc | 324 residents |
| 52 | Town of Vestal | | Sunbriar Estates 32 single-family h | Off South Jensen Road | 8-lot road completed for 8 | 128 residents |
| 53 | Town of Vestal | | Fuller Hollow Subdivision 36 single | Off Fuller Hollow Roa | 12-lot road under construc | 144 residents |
| 54 | Town of Vestal | | College Park Subdivision 8 single-f | Fuller Hollow Road/Si | 4-lot road under construct | 32 residents |
| 55 | Town of Vestal | | Valley View Subdivision 8 single-fa | Off South Jensen Road | 8-lot road under construct | 32 residents |
| 56 | Town of Vestal | | Country Gate Subdivision 51 single | Foster Road/Sheedy Ro | 20-lot road completed for | 204 residents |
| 57 | Town of Vestal | | Binghamton University (recent addit | | Major construction project | 14,000 students in 20 |
| 58 | Village of Johnson City | 2004-242 | Amazing Space Storage, LLC ? redeve | 701, 720 and 733 Azon | Proposed 2004 | 12 residents |
| 59 | Village of Johnson City | 2005-163 | Walgreen?s Pharmacy and other poten | 329, 331 and 335 Main | Proposed 2005 | |
| 60 | Village of Johnson City | | Forest Villas Subdivision 19 two-un | 1035 Anna Maria Drive | Proposed circa 2005 | 76 residents |

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S&W Project No. 61099
GIS Analyst: JJO
Project Mgr: JDG

Stearns & Wheler, LLC
Environmental Engineers and Scientists

May 2007

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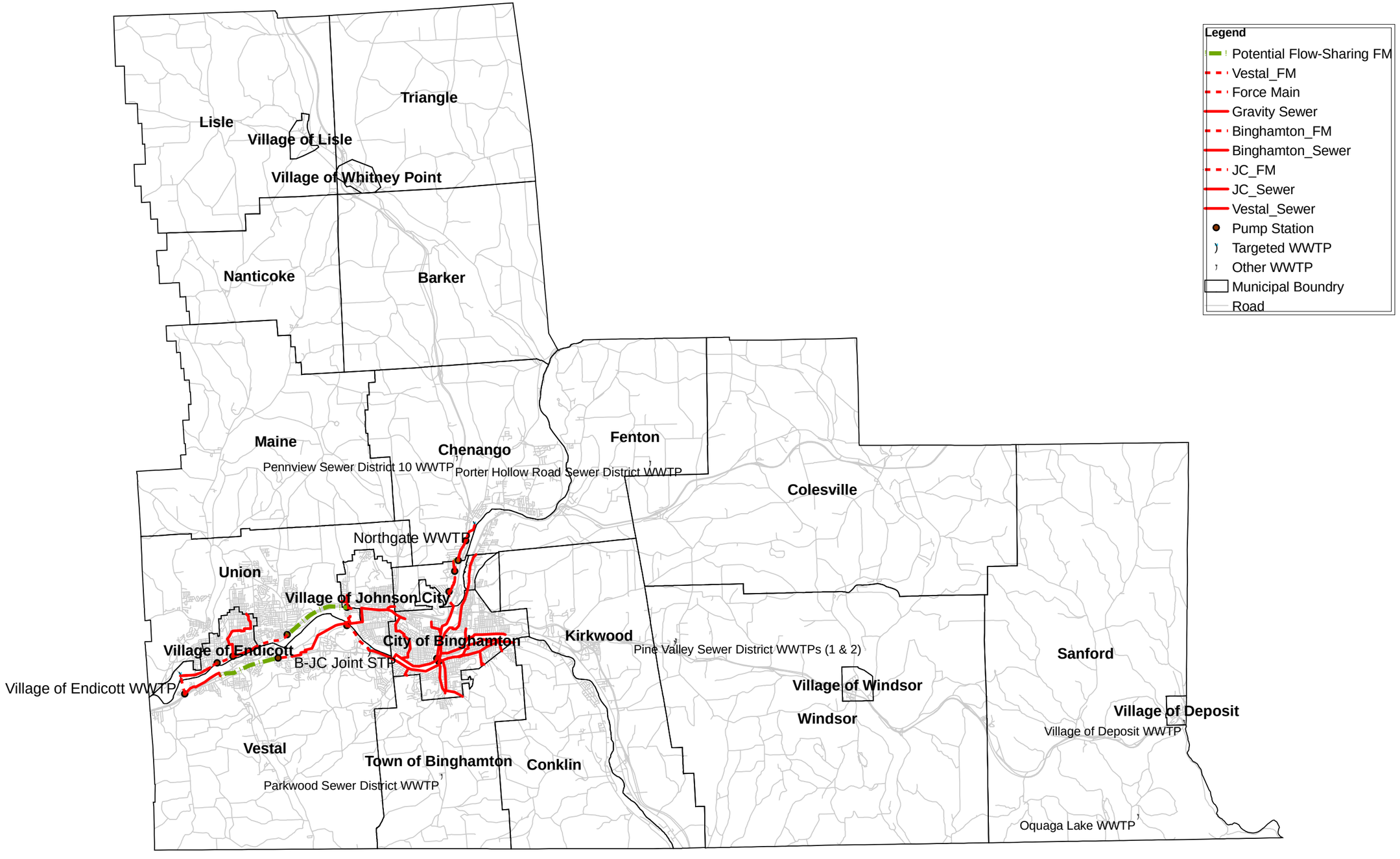
Department of Planning and Economic Development

# Broome County Financial Feasibility Study

## SEWERED AREAS AND POTENTIAL GROWTH LOCATIONS




Scale: 1 inch equals 3 miles

0 1.5 3 6 9 Miles

Filename & Path: J/GIS/Broome County/Maps/NJH BC County View -11x17.mxd

S&W Project No. 61099
GIS Tech.: NJH
Proj. Mgr: JDG

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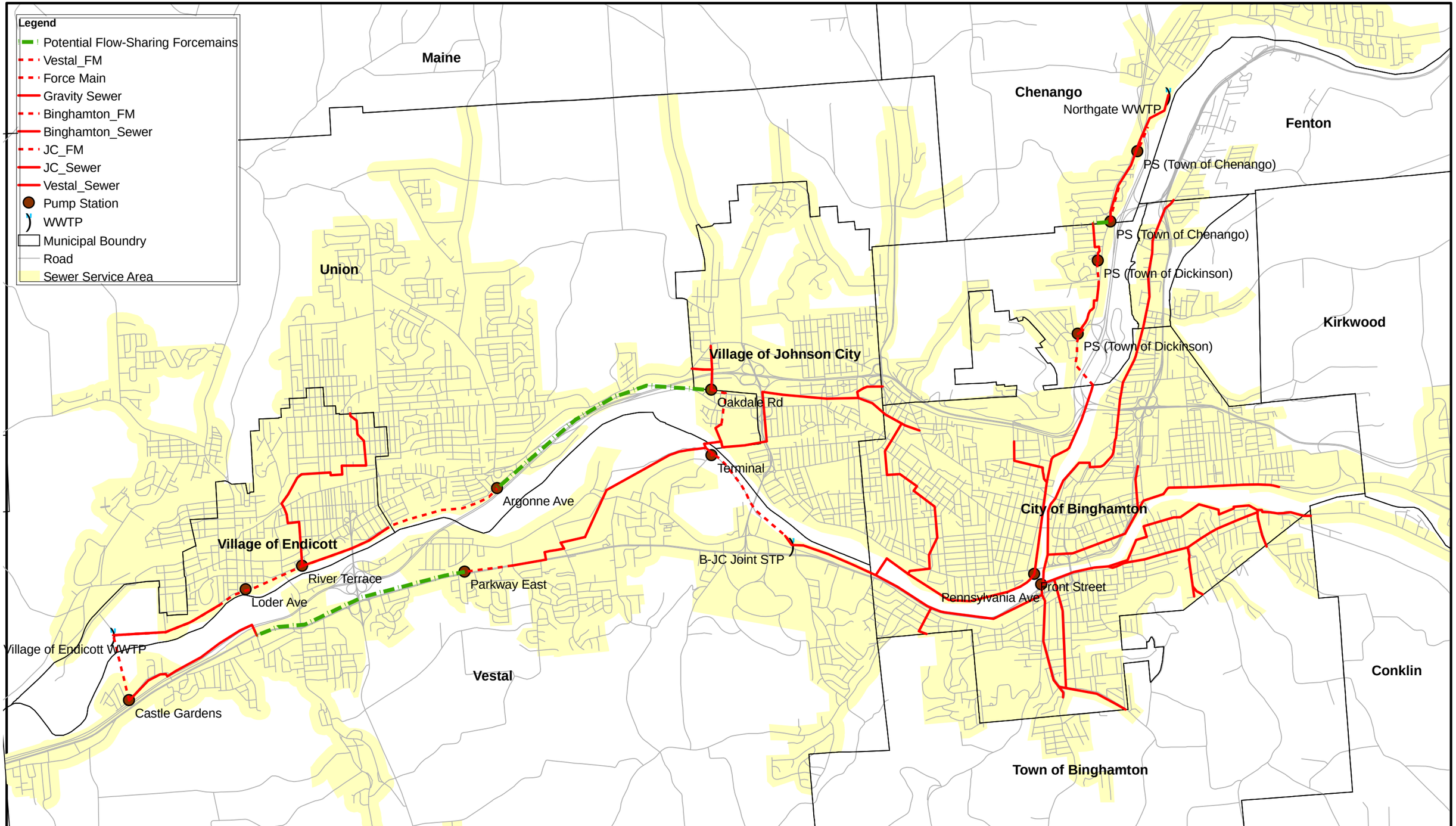
Environmental Engineers and Scientists

May 2007

**Department of Planning and Economic Development**

# Broome County Financial Feasibility Study

## COUNTY SEWER MAP




Scale: 1 inch equals 1 miles

0 0.25 0.5 1 1.5 Miles

Filename & Path: J/GIS/Broome County/Maps/NJH BC Sewers -11x17.mxd

S&W Project No. 61099
GIS Tech.: NJH
Proj. Mgr: JDG

Stearns & Wheler, LLC
Environmental Engineers and Scientists

May 2007

Department of Planning and Economic Development

# Broome County Financial Feasibility Study

## GREATER BINGHAMTON AREA MAP

# APPENDIX B

## INVENTORY SHEETS

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT

## BING-JC JOINT SEWAGE TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Bar Screens** | |
| Type | Mechanical Climber |
| Number of units | 2 |
| Width, feet | 4 |
| Bar spacing, inches | 0.75 |
| Capacity (each), mgd | 42 |
| Location | Head House |
| Manufacturer | IDI |
| Year in service | 2002 |
| **Influent Pumps** | |
| Type | Centrifugal (Shaft Driven) |
| Number of units | 4 |
| Capacity, gpm | 10,425 |
| Head, feet | 52 |
| Motor horsepower | 3 - 200 hp, 1 - 150 hp |
| Motor speed | 700 (for 200 hp) |
| Manufacturer | Flowserve |
| Year in service | 2003<br>2007 (Slated for replacement) |
| **Grit Channel** | |
| Type | Chain collection |
| Number of units | 2 |
| Dimensions | |
| Length, feet | 50 |
| Width, feet | 6 |
| Depth, feet | - |
| Year placed in service | 1958, 1968 |
| **Grit Separation** | |
| Type | Cyclone/classifier |
| Number of units | 2 |
| Grit pump | |
| Manufacturer | - |
| Type | - |
| Capacity, gpm | - |
| Motor horsepower | 10 |
| Manufacturer | - |
| Year placed in service | 1958, 1968 |
| **Grit Removal** | |
| Type | Vortex separation |
| Number of units | 2 |
| Grit Pump | |
| Type | Centrifugal |
| Capacity, gpm | - |
| Motor horsepower | 10 |
| Manufacturer | Smith & Loveless |
| Year placed in service | 2000 |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT

## BING-JC JOINT SEWAGE TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Primary Distribution** | |
| Ferric Chloride System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 2 @ 5,300 |
| Pumping System | Duplex Diaphragm |
| Flash Mixers | |
| Type | Propeller |
| Number of units | 2 |
| Motor horsepower | 3 |
| Manufacturer | Chemineer |
| **Primary Clarifiers** | |
| Type | Rectangular |
| Number of existing units | 6 |
| Total surface area, SF | 18,270 |
| Surface overflow rate (gal/day/SF) | |
| Average hydraulic loading | 940 gpd/SF |
| Peak hydraulic loading | 1,920 gpd/SF |
| Year placed in service | 1969 |
| Type | Rectangular |
| Number of new units | 6 |
| Total surface area, SF | 18,216 |
| Surface overflow rate (gal/day/SF) | |
| Average hydraulic loading | 940 gpd/SF |
| Peak hydraulic loading | 1,920 gpd/SF |
| **Primary Sludge Pumps** | |
| Type | Duplex Plunger |
| Number of units | 2 |
| Capacity, gpm | 120 |
| Head, feet | 23 |
| Motor horsepower | 10 |
| Year placed in service | 1958 |
| Manufacturer | - |
| Type | Centrifugal |
| Number of units | 2 |
| Capacity, gpm | 400 |
| Head, feet | 23 |
| Motor horsepower | 10 |
| Year placed in service | 1958 |
| **Gravity Thickeners** | |
| Type | Circular |
| Number of units | 3 |
| Tank dimensions | |
| Diameter, feet | 1 @ 40, 2 @ 60 |
| Year placed in service | 1958, 1968 |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT

## BING-JC JOINT SEWAGE TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Thickened Sludge Pumps** | |
| Type | Duplex Plunger |
| Number of units | 2 |
| Capacity, gpm | - |
| Motor horsepower | 1 @ 10, 1 @ 20 |
| Manufacturer | - |
| Year placed in service | - |
| | |
| Type | Rotary Lobe w/ Grinders |
| Number of units | 2 |
| Capacity, gpm | - |
| Motor horsepower | 15 |
| Manufacturer | Vogelsang |
| Year placed in service | 2006 |
| **Digesters** | |
| Type | Anaerobic |
| Number of tanks | 3 |
| Tank dimensions | |
| Diameter, feet | 1 @ 75, 2 @ 45 |
| Depth, feet | - |
| Volume, gallons | - |
| **RAS Pumps** | |
| Type | Centrifugal |
| Number of units | 4 |
| Capacity, gpm | 100 |
| Head, feet | 36 |
| Motor horsepower | 7.5 |
| Manufacturer | Wemco |
| Year placed in service | 2002 |
| **Effluent Water Pumps** | |
| Type | Centrifugal |
| Number of units | 3 |
| Capacity, gpm | 1,000 |
| Head, feet | 34 |
| Motor horsepower | 15 |
| Manufacturer | Fairbanks Morse |
| Year placed in service | - |
| **BAF Influent Pump Station** | |
| Type | Centrifugal |
| Number of units | 4 |
| Station capacity, mgd | 70 |
| Capacity (each), gpm | 17,200 |
| Head, feet | 45 |
| Motor horsepower | 250 |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT

## BING-JC JOINT SEWAGE TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **BAF System** | |
| C-Filters | |
| Capacity, mgd | 70 |
| Number of units | 8 |
| Area, sf | 1,389 |
| Media depth, ft | 12.5 |
| Peak Design Loading | 5 gpm/sf @ 70 mgd |
| N-Filters | |
| Capacity, mgd | 70 |
| Number of units | 8 |
| Area, sf | 1,366 |
| Media depth, ft | 11 |
| Peak Design Loading | 5.1 gpm/sf @ 70 mgd |
| DN-Filters | |
| Capacity, mgd | 49.5 |
| Number of units | 4 |
| Area, sf | 840 |
| Media depth, ft | 9.5 |
| Peak Design Loading | 10.2 gpm/sf @ 49.5 mgd |
| **Odor Control** | |
| Type | Scrubber |
| Number of units | 2 |
| Capacity, cfm | 18,000 |
| Capacity, gpm | 200 |
| Location | Scrubber Building |
| Year placed in service | 1992 |
| Caustic System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 3,000 |
| Sodium Hypochlorite System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 1,000 |
| | |
| Type | Scrubber |
| Number of units | 2 |
| Capacity, cfm | 45,000 |
| Capacity, gpm | 900 |
| Location | East Scrubber Building |
| Year placed in service | 1999 |
| Caustic System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 4,200 |
| Pumping System | Duplex Diaphragm |
| Sodium Hypochlorite System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 2 @ 4,200 |
| Pumping System | Duplex Diaphragm |
| Sulfuric Acid System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 4,200 |
| Pumping System | Duplex Diaphragm |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT

## BING-JC JOINT SEWAGE TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Odor Control Collection System** | |
| Odor Control Fans | |
| Grit Room | 1 @ 5 hp |
| Screenings Room | 2 @ 15 hp |
| Thickener #1 | 2 @ 3 hp |
| Thickener #2 | 2 @ 7.5 hp |
| Thickener #3 | 2 @ 7.5 hp |
| Composting Facility | 2 @ 7.5 hp |
| Odor Control Piping | |
| Length, feet | 1,500 |
| Year placed in service | - |
| **Disinfection** | |
| Chlorination Tank Volume, gal | 626,000 |
| Chlorination Contact Time, min. | 15 |
| Sodium Hypochlorite System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 3 @ 7,000 |
| Pumping System | Triplex Diaphragm |
| Capacity, gph (each pump) | 105 |
| Manufacturer | PulsaFeeder |
| Dechlorination Tank Volume, gal | 22,000 |
| Dechlorination Contact Time, min. | 0.5 |
| Sodium Thiosulfate System | |
| Tank Type | Vertical Cylindrical |
| Tank Size, gal | 2 @ 4,000 |
| Pumping System | Duplex Diaphragm |
| Capacity, gph (each pump) | 16 |
| Manufacturer | PulsaFeeder |
| Chlor/Dechlor Analyzer | |
| Manufacturer | USFilter |
| Year placed in service | 2007 Replacement (FEMA) |
| **Sludge Conveyance** | |
| Type | Troughed Belt |
| Length, feet | 340 |
| Year placed in service | 1991 |
| **Compost Facility** | |
| Type | Bioreactor |
| Year placed in service | 1991 |
| Manufacturer | Taulman Weiss |
| Storage Tank | |
| Type | Vertical Cylindrical |
| Number of units | 2 |
| Product Stored | Coarse Saw Dust |
| Diameter, feet | 21 |
| Height, feet | 40 |
| Nominal Capacity, cf | 12,050 |
| Manufacturer | Peabody TecTank |
| Year place in service | 1988 |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## BING-JC JOINT SEWAGE TREATMENT PLANT
## TERMINAL PUMPING STATION

| Equipment & Criteria | Data |
|---|---|
| **Channel Grinder** | |
| Number of units | 2 |
| Width, feet | - |
| Location | Influent Room |
| Manufacturer | JWC |
| Year in service | 2002 |
| **Influent Pumps** | |
| Type | Centrifugal (Shaft Driven) |
| Number of units | 4 |
| Capacity, gpm | 4,635 |
| Head, feet | 75 |
| Motor horsepower | 125 |
| Motor speed | 1150 |
| Manufacturer | Flowserve |
| Year in service | 2003<br>2007 (Slated for replacement) |
| **Air Compressors** | |
| Type | Reciprocating |
| Number of units | 2 |
| Motor horsepower | 5, 15 |
| **Hoisting Equipment** | |
| Type | Traveling Bridge Crane |
| Capacity, tons | 5 |
| Manufacturer | Dwight Foote, Inc. |

# BROOME COUNTY FINANCIAL FEASIBILITY STUDY

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## ENDICOTT WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Influent Pumps** | |
| Type | Centrifugal (shaft driven) |
| Number of units | 4 |
| Capacity, gpm | 6250 |
| Head, feet | 54 |
| Motor horsepower | 117 |
| Manufacturer | - |
| Year placed in service | 1966 |
| Backup pump motors (generators) | |
| Number of units | 2 |
| Manufacturer | International Harvester |
| Year placed in service | 1966 |
| **Bar Screen** | |
| Type | Mechanical |
| Number of units | 1 |
| Width, feet | 6 |
| Location | Influent Screen Room |
| Opening, inches | - |
| Manufacturer | USFilter-Envirex (Rex) |
| Year placed in service | 1990 |
| **Grit Removal** | |
| Type | Aerated Grit Chamber |
| Number of units | 1 |
| Aeration Blower | |
| Type | Positive Displacement |
| Number of units | 2 |
| Motor horsepower | 5 |
| Manufacturer | Roots |
| Year placed in service | 1966 |
| Grit pump | |
| Type | Centrifugal |
| Capacity, gpm | - |
| Motor horsepower | 10 |
| Manufacturer | Smith & Loveless |
| Year placed in service | |
| Grit conveyor | |
| Type | Shafted Screw |
| Manufacturer | Goodman Conveyors |
| Year placed in service | - |
| **Primary Clarifiers** | |
| Type | Rectangular |
| Number of units | 3 |
| Tank dimensions | |
| Length, feet | 170 |
| Width, feet | 30 |
| Sidewater depth, feet | 8 |
| Total surface area, SF | 15,300 |
| Surface overflow rate (gal/day/SF) | |
| Average hydraulic loading | 529 gpd/SF @ 8.09 mgd |
| Peak hydraulic loading | 2,288 gpd/SF @ 35 mgd |
| Year placed in service | 1966 |

# BROOME COUNTY FINANCIAL FEASIBILITY STUDY

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## ENDICOTT WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Trickling Filters** | |
| Type | Circular |
| Number of units | 2 |
| Media | Plastic |
| Diameter, feet | 120 |
| Media depth, feet | 18 |
| Total surface area, SF | 22,608 |
| Total volume | 406,944 |
| Average hydraulic loading | .25 gpm/SF @ 8.09 MGD |
| Average BOD loading | 29.9 lb/1,000 CF/day |
| Feed Pumps | |
| Type | Vertical Turbine |
| Number of units | 2 |
| Capacity, gpm | 11,110 |
| Head, feet | 32.5 |
| Motor horsepower | 125 |
| Manufacturer | Weir Floway |
| Year placed in service | 2001 |
| **Solids Contact Tank** | |
| No. of units | 2 |
| Dimensions | 40 feet x 21.5 feet |
| Side water depth | 16 feet |
| Average HRT | 0.61 hrs @ 8.09 mgd |
| Feed Pumps | |
| Type | Vertical Turbine |
| Number of units | 3 |
| Capacity, gpm | 6,600 |
| Head, feet | 30 |
| Motor horsepower | 75 |
| Manufacturer | Weir Floway |
| Year placed in service | 2001 |
| Aeration Blowers | |
| Type | Multistage Centrifugal |
| Number of units | 2 |
| Motor horsepower | 40 |
| Stages | 10 |
| Manufacturer | Lamson |
| Year placed in service | 2001 |
| **Secondary Clarifiers** | |
| No. of units | 2 rectangular / 2 circular |
| Dimensions | 198 feet x 24 feet / 80 feet diameter |
| Side Water Depth | 15 feet/8 feet |
| Ave Hydraulic Loading | 414 gpd/SF @ 8.09 mgd |
| Peak Hydraulic Loading | 818 gpd/SF @ 16 mgd |
| Year placed in service | 2001 / 1966 |

# BROOME COUNTY FINANCIAL FEASIBILITY STUDY

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## ENDICOTT WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Return Activated Sludge Pumps** | |
| Type | Centrifugal |
| Number of units | 4 |
| Capacity, gpm | 2,100 |
| Head, feet | 25 |
| Motor horsepower | 20 |
| Manufacturer | Flowserve |
| Year placed in service | 2001 |
| **Chlorination** | |
| Tank dimensions | |
| Length, feet | 135 |
| Width, feet | 44 |
| Year placed in service | 1966 |
| Rapid Mixer | |
| Estimated Size, hp | 7.5 |
| Sodium Hypochlorite System | |
| Chemical storage | 4 tanks @ 1550 gal each |
| Pump type | Diaphragm |
| Number of pumps | 2 |
| Year placed in service | 2001 |
| Sodium Bisulfite System | |
| Chemical storage | 2 tanks @ 300 gal each |
| Pump type | Diaphragm |
| Number of pumps | 2 |
| Year placed in service | 2001 |
| **Gravity Thickeners** | |
| Type | Circular |
| Number of units | 2 |
| Tank dimensions | |
| Diameter, feet | 40 |
| Depth, feet | - |
| Capacity, lbs/day | - |
| Year placed in service | 1966 |
| **Thickener Building** | |
| Furnace | |
| Capacity, BTU/hr | 168,000 - 188,000 |
| Manufacturer | Dayton |
| Year placed in service | 1980 |
| Primary/Waste Sludge Pumps | |
| Type | Centrifugal |
| Number of units | 4 |
| Capacity, gpm | 500 |
| Head, feet | 29 |
| Motor horsepower | 10 |
| Manufacturer | Wemco |
| Year placed in service | 3-1966 / 1-1985 |

# BROOME COUNTY FINANCIAL FEASIBILITY STUDY

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## ENDICOTT WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Thickened Sludge Pumps** | |
| Type | Diaphragm |
| Number of units | 1 |
| Capacity, gpm | 90 |
| Head, feet | 115 |
| Motor horsepower | 7.5 |
| Manufacturer | Abel |
| Year placed in service | 2003 |
| Type | Plunger (simplex) |
| Number of units | 1 |
| Capacity, gpm | - |
| Head, feet | - |
| Motor horsepower | 10 |
| Manufacturer | ITT Marlow |
| Year placed in service | 1966 |
| Inline Grinders (one per TSP) | |
| Number of units | 2 |
| Manufacturer | Muffin Monster |
| Year placed in service | - |
| **Digesters** | |
| Type | Anaerobic |
| Number of tanks | 2 |
| Tank dimensions | |
| Diameter, feet | 50 |
| Depth, feet | 34 |
| Volume, gallons | 500,000 |
| **Sludge Recirc Pumps** | |
| Type | Centrifugal |
| Number of units | 2 |
| Capacity, gpm | 500 |
| Head, feet | 20 |
| Motor horsepower | 10 |
| Motor speed | 440 |
| Manufacturer | Morris |
| Year placed in service | 1966 |

# BROOME COUNTY FINANCIAL FEASIBILITY STUDY

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## ENDICOTT WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Digester Building** | |
| Sludge Pump | |
| Type | Chopper |
| Number of units | 1 |
| Capacity, gpm | 300 |
| Head, feet | 22 |
| Motor horsepower | 10 |
| Motor speed | 1170 |
| Manufacturer | Vaughn |
| Year placed in service | 1994 |
| Sludge Transfer Pump | |
| Type | Duplex plunger |
| Number of units | 1 |
| Capacity, gpm | - |
| Head, feet | - |
| Motor horsepower | 5 |
| Motor speed | - |
| Manufacturer | ITT Marlow |
| Year placed in service | 1966 |
| Boiler | |
| Number of units | 2 |
| Size, hp | 34.2 |
| Manufacturer | Iron Fireman |
| Year placed in service | 1966 |
| Heat Exchanger | |
| Type | Shell & Tube |
| Number of units | 2 |
| Year placed in service | 1966 |
| **Sludge Dewatering** | |
| Type | Belt Press |
| Location | Sludge Processing Building |
| Manufacturer | USFilter-Envirex (Rex) |
| Number of units | 1 |
| Size | 2 meter |
| Year placed in service | 1984 |
| Feed Pumps | |
| Type | Simplex Plunger |
| Location | Sludge Processing Building |
| Number of units | 3 |
| Capacity, gpm | 173 |
| Stroke capacity | 4-6 gal/stroke |
| Motor horsepower | 10 |
| Motor speed | 1800 |
| Manufacturer | ITT Marlow |
| Year placed in service | 1966 |

# BROOME COUNTY FINANCIAL FEASIBILITY STUDY

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## ENDICOTT WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Sludge Conveyance** | |
| Type | Cleated Belt |
| Number of units | 2 |
| Length, ft | 20 & 60 |
| Year placed in service | 1984 |
| **Effluent Water Pumps** | |
| Type | Centrifugal |
| Number of units | 2 |
| Capacity, psi | 290 |
| Motor horsepower | 10 |
| Manufacturer | Ingersol Rand |
| Year placed in service | 1966 |
| **Plant Generator** | |
| Type | Diesel Engine Generator |
| Capacity, kW | 400 |
| Manufacturer | Katolight |
| Year placed in service | ~1976 |
| **Control Building Furnaces** | |
| Number of units | 2 |
| Manufacturer | Cleaver Brooks |
| Year placed in service | ~1966 |
| **Compost Facility** | |
| Type | Bioreactor |
| Year placed in service | 1984 |
| Manufacturer | Taulman Weiss |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## NORTHGATE WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Manual Bar Rack** | |
| Type | Fixed |
| Number of units | 1 |
| Width, feet | 1.5 |
| Location | Main Feed Channel |
| Opening, inches | 2 |
| Year placed in service | 1993 |
| **Parshall Flume** | |
| Number of units | 2 |
| Throat width, inches | 6 |
| Capacity, mgd | 4 |
| Location | Pretreatment tank |
| Year placed in service | 1993 and 1997 |
| **Activated Sludge Pump** | |
| Number of pumps | 3 |
| Type | Non Clog Recessed Impeller |
| Motor horsepower, each pump | 1.5 - 3 Phase 460 V |
| Capacity, gpm | 200 |
| Pump manufacturer | Hydromatic S4NRC |
| Year placed in service | 1997; 10/2005; 10/2006 |
| **Aeration Tank** | |
| Number of tanks | 3 |
| Type | Rectangular |
| Tank dimensions | |
| Length, feet | 2 - 64; 1 - 30 |
| Width, feet | 2 - 20; 1 - 10 |
| Sidewater depth, feet | 19 |
| Total surface area, SF | 3160 |
| Total aeration volume, CF | 60040 |
| Year placed in service | 2-1993; 1-1997 |
| **Aeration Blowers** | |
| Number of units | 8 |
| Type | Positive Displacement |
| Horsepower, HP | 2-50HP; 2-40HP; 2-15HP; 2-10HP; |
| Manufacturer | Beldor |
| Year placed in service | 1993 (50&10 HP); 1997 (40&15HP) |
| **Waste Activated Sludge Pump** | |
| Number of pumps | 2 |
| Type | Air Lift |
| Motor horsepower, each pump | - |
| Capacity, gpm | 200 |
| Pump manufacturer | Cass |
| Year placed in service | 1993 |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT
## NORTHGATE WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Gravity Belt Thickener** | |
| Type | Belt - 1 meter |
| Number of units | 1 |
| Size | 1-meter |
| Capacity, gpm | 75 GPM |
| Year placed in service | 1997 |
| **Digester** | |
| Number of tanks | 1 Stainless Steel |
| Cover type | Aerobic |
| Tank dimensions | |
| Diameter, feet | 30 |
| Sidewater depth, feet | 20 |
| Total volume, gallons | 100,000 |
| Year placed in service | 1996 |
| **Sludge Dewatering** | |
| Type | Belt Press |
| Location | Sludge building |
| Manufacturer and model | Belt Dewatering Press MFD, Inc. |
| Number of units | 1 |
| Motor horsepower | 3 |
| Capacity, gpm | 100 |
| Solids Content | Up to 17% |
| Year placed in service | 1993 |
| Feed pumps | |
| Type | Progressive cavity |
| Location | Sludge building |
| Number of units | 1 |
| Drive, HP | 3 |
| Manufacturer | Penn Valley Double Disk |
| Year placed in service | 1997 |
| Chemical conditioning, polymer | |
| Number of pumps | 1 |
| Type | Liquid Polymer |
| Location | Sludge building |
| Capacity, gpm | 5 |
| Loading, lbs/ton dry solids | - |
| Manufacturer | Wallace & Tiernan |
| Number of mixing tanks | 1 |
| **Power Screen** | |
| Number of screens | 1 |
| Manufacturer and model | Power Screen, Series MK1 |
| Motor horsepower | 30 |
| Year placed in service | 1993 |

## INVENTORY OF TREATMENT FACILITIES AND PROCESS EQUIPMENT

## NORTHGATE WASTEWATER TREATMENT PLANT

| Equipment & Criteria | Data |
|---|---|
| **Comptainer System** | |
| Number of comploaders | 1 |
| Number of comptainers | 8 |
| Number of composting tanks | 2 |
| Manufacturer | Green Mountain Technologies |
| Year placed in service | 2001 |

# APPENDIX C

# COST TABLES

## APPENDIX C

## YEAR CONSTRUCTED DOLLAR VALUE - SAMPLE CALCULATION

| *Column Identification* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** | ***8*** | ***9*** |
| **Item** | **Year Constructed** | **Quantity** | | **Construction Cost** | | | **Depreciation Rate** | **Current Value** |
| | | **No. Units** | **Unit Measure** | **Per Unit** | **Estimated 2007** | **Year of Construction** | | |
| Mechanical Bar Screen | 1990 | 1 | l.s. | $116,000 | - | $116,000 | $5,800 | $17,400 |

1. The actual construction cost for the mechanical bar screen at the Endicott WWTP was $116,000 in 1990.

2. Year of Construction Cost: $\boxed{Column\_7 = (Column\_2) \times (Column\_5) \Rightarrow \$116{,}000 = 1 \times \$116{,}000}$

3. Depreciation Rate: $\boxed{Column\_8 = \left(\frac{Column\_7}{Useful\_Life}\right) \Rightarrow \$5{,}800 = \$\left(\frac{\$116{,}000}{20\,years}\right)}$

4. Current Value:

$$\boxed{Column\_9 = Column\_7 - (Column\_8 \times (2007 - Column\_2)) \Rightarrow \$17{,}400 = \$116{,}000 - (\$5{,}800 \times (2007 - 1990))}$$

# Broome County Financial Feasibility Study
# Binghamton-Johnson City Joint Sewage Board
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Current Plant Improvement Projects** | | | | | | | | |
| IDI BAF System | 2007 | 1 | l.s. | $9,740,000 | - | $9,740,000 | $194,800 | $9,740,000 |
| IDI System Installation<br>- BAF Filter Complex<br>- Chlorine Contact Tank<br>- Sec. Influent Pump Station<br>- Blower Building | 2007 | 1 | l.s. | $24,540,000 | - | $24,540,000 | $490,800 | $24,540,000 |
| Solids Handling Improvements<br>- Digester Improvements<br>- Sludge Pumps & Grinders<br>- Centrifuges | 2007 | 1 | l.s. | $6,660,000 | - | $6,660,000 | $133,200 | $6,660,000 |
| Screenings, Pumps, & Dist. Struct.<br>- Mechanical Bar Screens<br>- Terminal PS Pumps<br>- STP Influent Pumps<br>- Primary Clarifier Dist. Box | 2002 | 1 | l.s. | $2,430,000 | - | $2,430,000 | $48,600 | $2,187,000 |
| | | | | | | | **Total** | **$43,127,000** |
| **Wastewater Treatment Plant Buildings** | | | | | | | | |
| Head House FEMA Repairs | 2007 | 1 | l.s. | $18,500 | - | $18,500 | $370 | $18,500 |
| Sample Building | 2007 | 1 | l.s. | $16,100 | - | $16,100 | $322 | $16,100 |
| Compost Facility [2] | 1991 | 1 | l.s. | $9,800,000 | - | $9,800,000 | $196,000 | $5,664,000 |
| Head House | 1958 | 12800 | sq. ft. | $250 | $3,200,000 | $308,223 | $6,164 | $6,164 |
| Garage | 1958 | 2280 | sq. ft. | $250 | $570,000 | $54,902 | $1,098 | $1,098 |
| Grit Room (Binghamton) | 1958 | 2080 | sq. ft. | $250 | $520,000 | $50,086 | $1,002 | $1,002 |
| Grit Room (Johnson City) | 1968 | 1280 | sq. ft. | $250 | $320,000 | $46,904 | $938 | $10,319 |
| Grit Building | 1958 | 832 | sq. ft. | $250 | $208,000 | $20,035 | $401 | $401 |
| Blower House | 1972 | 6500 | sq. ft. | $250 | $1,625,000 | $361,501 | $7,230 | $108,450 |
| Scrubber Building | 1993 | 1008 | sq. ft. | $250 | $252,000 | $166,628 | $3,333 | $119,972 |
| East Scrubber Building | 1999 | 3552 | sq. ft. | $250 | $888,000 | $682,844 | $13,657 | $573,589 |
| Sludge Control Station #1 | 1958 | 1800 | sq. ft. | $250 | $450,000 | $43,344 | $867 | $867 |
| Sludge Control Station #2 | 1968 | 3200 | sq. ft. | $250 | $800,000 | $117,259 | $2,345 | $25,797 |
| Thickener #1 Pump Station | 1958 | 480 | sq. ft. | $250 | $120,000 | $11,558 | $231 | $231 |
| Thickener #2 Pump Station | 1958 | 720 | sq. ft. | $250 | $180,000 | $17,338 | $347 | $347 |
| Chlorination Building | 2000 | 1800 | sq. ft. | $250 | $450,000 | $355,270 | $7,105 | $305,532 |
| | | | | | | | **Total** | **$6,852,369** |

# Broome County Financial Feasibility Study
# Binghamton-Johnson City Joint Sewage Board
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Wastewater Treatment Plant Tankage** | | | | | | | | |
| Primary Clarifiers #1-4 | 1958 | 4 | ea | $500,000 | $2,000,000 | $192,640 | $3,853 | $3,853 |
| #5 & #6 | 1968 | 2 | ea | $600,000 | $1,200,000 | $175,888 | $3,518 | $38,695 |
| #7 - #10 | 1972 | 4 | ea | $850,000 | $3,400,000 | $756,371 | $15,127 | $226,911 |
| Digesters #1 & #2 (45' Dia.) | 1958 | 2 | ea | $500,000 | $1,000,000 | $96,320 | $1,926 | $1,926 |
| Digester #3 (75' Dia.) | 1968 | 1 | ea | $1,000,000 | $1,000,000 | $146,574 | $2,931 | $32,246 |
| Thickeners (40' Dia.) | 1958 | 1 | ea | $140,000 | - | $140,000 | $2,800 | $2,800 |
| (60' Dia.) | 1968 | 2 | ea | $180,000 | - | $360,000 | $7,200 | $79,200 |
| Chlorine Contact Tanks | 1968 | 1 | l.s. | $1,500,000 | $1,500,000 | $219,860 | $4,397 | $48,369 |
| | | | | | | | **Total** | **$434,001** |
| **Wastewater Treatment Plant Equipment** | | | | | | | | |
| Plant Influent Pumps | 2007 | 4 | ea | $125,000 | - | $500,000 | $25,000 | $500,000 |
| Head House Sump Pumps | 2007 | 1 | l.s. | $1,400 | - | $1,400 | $70 | $1,400 |
| Bar Screen Motor | 2007 | 1 | ea | $600 | - | $600 | $30 | $600 |
| Grit Removal Equipment - 10 hp Vortex Grit System | 2000 | 1 | l.s. | $850,000 | $850,000 | $671,065 | $33,553 | $436,192 |
| Primary Sludge Pumps (10 hp plunger) | 1958 | 2 | ea | - | - | - | - | $0 |
| (10 hp centrifugal) | 1958 | 2 | ea | - | - | - | - | $0 |
| East Primary Clarifier Building - Motors - Control Panels - PLCs | 2007 | 1 | l.s. | $53,000 | - | $53,000 | $2,650 | $53,000 |
| East Primary Clarifier Building - Pumps - Motors - Electrical Equipment - Misc. Equipment | 2007 | 1 | l.s. | $54,000 | - | $54,000 | $2,700 | $54,000 |
| Primary Settling Tanks #1-6 - Motors - Chains & Flights | 2007 | 1 | l.s. | $66,500 | - | $66,500 | $3,325 | $66,500 |
| Primary Settling Tanks #7-10 - Motors - Chains & Flights | 2007 | 1 | l.s. | $243,000 | - | $243,000 | $12,150 | $243,000 |
| Sodium Hypochlorite Tanks - 7,000 gal. | 2000 | 3 | l.s. | $15,000 | $45,000 | $35,527 | $1,776 | $23,093 |
| Sodium Thiosulfate Tanks - 4,000 gal. | 2000 | 2 | l.s. | $11,000 | $22,000 | $17,369 | $868 | $11,290 |

# Broome County Financial Feasibility Study
# Binghamton-Johnson City Joint Sewage Board
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| Chlorination Building | | | | | | | | |
| - Analyzers | | | | | | | | |
| - Pumps & Motors | | | | | | | | |
| - Misc. Equipment | 2007 | 1 | l.s. | $66,000 | - | $66,000 | $3,300 | $66,000 |
| Thickened Sludge Pumps | | | | | | | | |
| (10 hp plunger) | 1958 | 1 | ea | - | - | - | - | $0 |
| (20 hp plunger) | 1968 | 1 | ea | - | - | - | - | $0 |
| Thickener #1 Building | | | | | | | | |
| - Motor | | | | | | | | |
| - Heater | | | | | | | | |
| - Electrical Equipment | 2007 | 1 | l.s. | $4,300 | - | $4,300 | $215 | $4,300 |
| Thickener #2 & #3 Buildings | | | | | | | | |
| - Heater | | | | | | | | |
| - Electrical Equipment | 2007 | 1 | l.s. | $20,000 | - | $20,000 | $1,000 | $20,000 |
| Odor Control System | 1999 | 1 | l.s. | $1,400,000 | $1,400,000 | $1,076,556 | $53,828 | $645,934 |
| East Scrubber Building | | | | | | | | |
| - Motors | | | | | | | | |
| - Fans | | | | | | | | |
| - Control Panels | | | | | | | | |
| - Heater | 2007 | 1 | l.s. | $104,000 | - | $104,000 | $5,200 | $104,000 |
| Digester Complex | | | | | | | | |
| - Recirc. Pumps & Motors | | | | | | | | |
| - Sump Pumps | | | | | | | | |
| - Electrical Equipment | 2007 | 1 | l.s. | $6,000 | - | $6,000 | $300 | $6,000 |
| Compost Facility | | | | | | | | |
| - VFDs | | | | | | | | |
| - Misc. Equipment | 2007 | 1 | l.s. | $18,000 | - | $18,000 | $900 | $18,000 |
| Lime Stabilization Equipment | 2007 | 1 | l.s. | $430,000 | - | $430,000 | $21,500 | $430,000 |
| RAS Pumps (7.5 hp) | 2002 | 4 | ea | $20,000 | $80,000 | $66,375 | $3,319 | $49,781 |
| Effluent Water Pumps (15 hp) | 1988 | 2 | ea | $25,000 | $50,000 | $28,677 | $1,434 | $1,434 |
| | | | | | | | **Total** | **$2,734,523** |
| **Pump Stations** | | | | | | | | |
| Terminal | | | | | | | | |
| Influent Pumps | 2007 | 4 | ea | $320,000 | - | $1,280,000 | $64,000 | $1,280,000 |
| Electrical Equipment | 2007 | 1 | l.s. | $610,000 | - | $610,000 | $30,500 | $610,000 |
| Building | 1960 | 4200 | sq. ft. | $250 | $1,050,000 | $109,797 | $2,196 | $6,588 |
| | | | | | | | **Total** | **$1,896,588** |

# Broome County Financial Feasibility Study
# Binghamton-Johnson City Joint Sewage Board
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Collection System** | | | | | | | | |
| 30" Forcemain (?) | 1960 | 3400 | l.f. | $200 | $680,000 | $71,107 | $948 | $26,546 |
| | | | | | | | **Total** | **$26,546** |
| **Miscellaneous Equipment** | | | | | | | | |
| Pickup Truck | 2002 | 1 | ea. | - | - | - | - | $8,000 |
| Pickup Truck | 2003 | 1 | ea. | - | - | - | - | $8,500 |
| Lugger Truck | 1983 | 2 | ea. | - | - | - | - | $10,000 |
| Dump Truck | 1999 | 1 | ea. | - | - | - | - | $19,000 |
| Dump Truck | 2006 | 1 | ea. | - | - | - | - | $40,000 |
| Scissor Lift | 2006 | 1 | ea. | - | - | - | - | $13,000 |
| Hand Fork Lift | 1990 | 1 | ea. | - | - | - | - | $2,500 |
| Skid Steer | 2005 | 1 | ea. | - | - | - | - | $20,000 |
| | | | | | | | **Total** | **$121,000** |

| **Grand Total** | **$55,000,000** |
|---|---|

Notes:

1. Straight Line Depreciation: Dj = (C-Sn)/n

| | | |
|---|---|---|
| n = | 20 | years (Equipment) |
| n = | 50 | years (Buildings & Structures) |
| n = | 75 | years (Piping) |

* Items beyond their useful life were assigned a value of zero.

| Abbreviations | |
|---|---|
| ea. | Each |
| l.f. | Linear Foot |
| l.s. | Lump Sum |
| sq. ft. | Square Foot |

2. Based on information provided in the Solids Handling Feasibility Study by Stearns & Wheler for the Binghamton-Johnson City Sewage Board dated October 05' an amount of $1,000,000 has been subtracted from the "Current Value" for the Compost Facility in order to bring the facility back up to operational status.

# Broome County Financial Feasibility Study
## Village of Endicott
## Asset Valuation
## Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Wastewater Treatment Plant Buildings** | | | | | | | | |
| Admin. Building | 1966 | 7800 | sq. ft. | $250 | $1,950,000 | $252,164 | $5,043 | $45,389 |
| Digester Complex | 1971 | 1 | l.s. | $570,000 | - | $570,000 | $11,400 | $159,600 |
| RAS Pump Station | 2001 | 1 | l.s. | $375,000 | - | $375,000 | $7,500 | $330,000 |
| Blower Building | 2001 | 1 | ea. | $430,000 | - | $430,000 | $8,600 | $378,400 |
| Recirculation Pump Station | 2001 | 1 | ea. | $450,000 | - | $450,000 | $9,000 | $396,000 |
| | 1971 | 1 | ea. | $310,000 | - | $310,000 | $6,200 | $86,800 |
| Sludge Process Building | 1966 | 8500 | sq. ft. | $250 | $2,125,000 | $274,794 | $5,496 | $49,463 |
| Thickener Building | 1966 | 1350 | sq. ft. | $250 | $337,500 | $43,644 | $873 | $7,856 |
| Grit Building | 1990 | 1100 | sq. ft. | $250 | $275,000 | $165,137 | $3,303 | $108,990 |
| Compost Facility | 1986 | 1 | l.s. | $1,911,000 | - | $1,911,000 | $38,220 | $1,108,380 |
| Garage | 1966 | 1300 | sq. ft. | $250 | $325,000 | $42,027 | $841 | $7,565 |
| | | | | | | | **Total** | **$2,680,000** |
| **Wastewater Treatment Plant Tankage** | | | | | | | | |
| Aerated Grit Chamber | 1966 | 1 | l.s. | $150,000 | $150,000 | $19,397 | $388 | $3,491 |
| Primary Clarifiers [2] | 2001 | 1 | l.s. | $12,000 | - | $12,000 | $240 | $10,560 |
| | 1966 | 1 | l.s. | $2,300,000 | $2,300,000 | $297,424 | $5,948 | $53,536 |
| Secondary Clarifiers [3] | 2001 | 1 | l.s. | $50,000 | - | $50,000 | $1,000 | $44,000 |
| | 1971 | 1 | l.s. | $280,000 | - | $280,000 | $5,600 | $78,400 |
| Solids Contact Tank & Secondary Clarifiers [4] | 2001 | 1 | l.s. | $2,300,000 | - | $2,300,000 | $46,000 | $2,024,000 |
| Biotowers | 2001 | 1 | l.s. | $3,350,000 | - | $3,350,000 | $67,000 | $2,948,000 |
| Thickeners [5] | 1966 | 1 | l.s. | $140,000 | - | $140,000 | $2,800 | $25,200 |
| Waste Sludge Line | 2001 | 1 | l.s. | $30,000 | - | $30,000 | $600 | $26,400 |
| Chlorine Contact Tank | 1966 | 1 | l.s. | $1,200,000 | $1,200,000 | $155,178 | $3,104 | $27,932 |
| | | | | | | | **Total** | **$5,240,000** |
| **Wastewater Treatment Plant Equipment** | | | | | | | | |
| Influent Pumps | 1966 | 2 | ea. | - | - | - | - | $0 |
| Influent Pumps | 2007 | 2 | ea. | $25,000 | - | $50,000 | $2,500 | $50,000 |
| 125 hp Engine Drives | 2007 | 2 | ea. | $10,000 | - | $20,000 | $1,000 | $20,000 |
| Flow Meters | 2007 | 3 | ea. | $10,000 | - | $30,000 | $1,500 | $30,000 |
| Mechanical Bar Screen | 1990 | 1 | l.s. | $116,000 | - | $116,000 | $5,800 | $17,400 |
| Aerated Grit Chamber Blowers | 1966 | 2 | ea. | - | - | - | - | $0 |
| Grit Pump | 2001 | 1 | ea. | $20,000 | $20,000 | $16,097 | $805 | $11,268 |
| Grit Screw Conveyor (Classifier) | 2001 | 1 | ea. | $30,000 | $30,000 | $24,145 | $1,207 | $16,901 |
| Furnace (Thickener Building) | 1980 | 1 | ea. | - | - | - | - | $0 |
| Primary Sludge Pumps (10 hp, centrifugal) | 1966 | 3 | ea. | - | - | - | - | $0 |

# Broome County Financial Feasibility Study
## Village of Endicott
## Asset Valuation
## Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| Primary Sludge Pumps (10 hp, centrifugal) | 1985 | 1 | ea. | - | - | - | - | $0 |
| Thickened Sludge Pump (7.5 hp, 90 gpm, diaphragm) | 1997 | 1 | ea. | $8,200 | - | $8,200 | $410 | $4,100 |
| | 2003 | 1 | ea. | $4,400 | - | $4,400 | $220 | $3,520 |
| (10 hp, plunger) | 1966 | 1 | ea. | - | - | - | - | $0 |
| Pipe Grinders | 2001 | 2 | ea. | $10,000 | $20,000 | $16,097 | $805 | $11,268 |
| Sludge Recirculation Pumps (10 hp, 500 gpm) | 1966 | 2 | ea. | - | - | - | - | $0 |
| Chopper Pump (10 hp, 300 gpm) | 1994 | 1 | ea. | $20,000 | $20,000 | $13,725 | $686 | $4,804 |
| Sludge Transfer Pump | 1966 | 1 | ea. | - | - | - | - | $0 |
| Digester Boiler | 1966 | 1 | ea. | - | - | - | - | $0 |
| Digester Heat Exchangers | 1966 | 2 | ea. | - | - | - | - | $0 |
| Belt Filter Press (2-meter) | 1984 | 1 | ea. | - | - | - | - | $0 |
| Belt Filter Press Feed Pumps (10 hp, 173 gpm) | 1966 | 3 | ea. | - | - | - | - | $0 |
| Sludge Conveyor (60' cleated) | 1984 | 1 | ea. | - | - | - | - | $0 |
| Sludge Conveyor (20' cleated) | 1984 | 1 | ea. | - | - | - | - | $0 |
| Effluent Water Pumps (10 hp) | 1966 | 2 | ea. | - | - | - | - | $0 |
| Plant Backup Generator (400 hp) | 1976 | 1 | ea. | - | - | - | - | $0 |
| Hypochlorite & Bisulfite System | 2001 | 1 | l.s. | $160,000 | - | $160,000 | $8,000 | $112,000 |
| Admin. Building FEMA Repairs | 2007 | 1 | l.s. | $82,000 | - | $82,000 | $4,100 | $82,000 |
| Garage FEMA Repairs | 2007 | 1 | l.s. | $13,000 | - | $13,000 | $650 | $13,000 |
| Sludge Process Building FEMA Repairs | 2007 | 1 | l.s. | $32,000 | - | $32,000 | $1,600 | $32,000 |
| Digester Building FEMA Repairs | 2007 | 1 | l.s. | $5,000 | - | $5,000 | $250 | $5,000 |
| RAS Pump Station FEMA Repairs | 2007 | 1 | l.s. | $2,600 | - | $2,600 | $130 | $2,600 |
| Biofilter FEMA Repairs | 2007 | 1 | l.s. | $14,000 | - | $14,000 | $700 | $14,000 |
| Grit Building FEMA Repairs | 2007 | 1 | l.s. | $3,000 | - | $3,000 | $150 | $3,000 |
| Thickener Building FEMA Repairs | 2007 | 1 | l.s. | $20,000 | - | $20,000 | $1,000 | $20,000 |
| Samplers | 2007 | 2 | ea | $4,600 | - | $9,200 | $460 | $9,200 |
| | | | | | | | **Total** | **$460,000** |
| **Wastewater Treatment Plant Miscellaneous** | | | | | | | | |
| Misc Earthwork [6] | 2001 | 1 | l.s. | $316,000 | - | $316,000 | - | $0 |
| Electrical Upgrades | 2001 | 1 | l.s. | $161,500 | - | $161,500 | $3,230 | $142,120 |
| Electrical Site Work | 2001 | 1 | l.s. | $153,400 | - | $153,400 | $3,068 | $134,992 |
| HVAC Work | 2001 | 1 | l.s. | $126,500 | - | $126,500 | $2,530 | $111,320 |
| FEMA Repairs | 2007 | 1 | l.s. | $44,800 | - | $44,800 | $896 | $44,800 |
| | | | | | | | **Total** | **$430,000** |

# Broome County Financial Feasibility Study
## Village of Endicott
## Asset Valuation
## Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Pump Stations** | | | | | | | | |
| Loder Ave | | | | | | | | |
| Loder Ave (General) | 1957 | 1 | l.s. | $112,000 | - | $112,000 | - | $0 |
| Loder Ave (Plumbing) | 1957 | 1 | l.s. | $8,000 | - | $8,000 | - | $0 |
| Loder Ave (Electrical) | 1957 | 1 | l.s. | $12,500 | - | $12,500 | - | $0 |
| Loder Ave (HVAC) | 1957 | 1 | l.s. | $2,800 | - | $2,800 | - | $0 |
| Loder Ave Pumps (30 hp) | 1975 | 3 | ea. | - | - | - | - | $0 |
| River Terrace | | | | | | | | |
| General | 1958 | 1 | l.s. | $282,000 | - | $282,000 | $5,640 | $5,640 |
| Plumbing | 1958 | 1 | l.s. | $13,000 | - | $13,000 | $260 | $260 |
| Electrical | 1958 | 1 | l.s. | $19,000 | - | $19,000 | $380 | $380 |
| Additional Work | 1959 | 1 | l.s. | $84,500 | - | $84,500 | $1,690 | $3,380 |
| Modifications | 1971 | 1 | l.s. | $68,000 | - | $68,000 | $1,360 | $19,040 |
| Pumps (200 hp) | 1971 | 2 | ea. | - | - | - | - | $0 |
| Pump (125/87 hp) | 1971 | 1 | ea. | - | - | - | - | $0 |
| Argonne Ave | | | | | | | | |
| Structure | 1970 | 1 | l.s. | $600,000 | $600,000 | $105,152 | $2,103 | $27,340 |
| Pumps (3000 gpm) | 1970 | 2 | ea. | - | - | - | - | $0 |
| Argonne Ave Backup Generator | 2004 | 1 | ea. | $200,000 | $200,000 | $180,581 | $9,029 | $153,494 |
| FEMA Repairs | 2007 | 1 | l.s. | $210,000 | - | $210,000 | $10,500 | $210,000 |
| | | | | | | | **Total** | **$420,000** |
| **Collection System** | | | | | | | | |
| 10" Gravity | Prior to 1932 | 130 | l.f. | - | - | - | - | $0 |
| 12" Gravity | Prior to 1932 | 1995 | l.f. | - | - | - | - | $0 |
| 15" Gravity | Prior to 1932 | 1566 | l.f. | - | - | - | - | $0 |
| 16" Gravity | Prior to 1932 | 219 | l.f. | - | - | - | - | $0 |
| 18" Gravity | Prior to 1932 | 570 | l.f. | - | - | - | - | $0 |
| 24" Gravity | Prior to 1932 | 579 | l.f. | - | - | - | - | $0 |
| 24" Gravity (C.I.) | Prior to 1932 | 3687 | l.f. | - | - | - | - | $0 |
| 24" Gravity (R.C.P.) | Prior to 1932 | 1636 | l.f. | - | - | - | - | $0 |
| 30" Gravity | Prior to 1932 | 1400 | l.f. | - | - | - | - | $0 |
| | 1959 | 2155 | l.f. | $67 | | $144,385 | $1,925 | $51,979 |
| 30" Gravity (C.I.) | Prior to 1932 | 920 | l.f. | - | - | - | - | $0 |
| 36" Gravity | 1959 | 2813 | l.f. | $81 | - | $227,853 | $3,038 | $82,027 |
| 36" Gravity (R.C.P.) | 1959 | 4699 | l.f. | $81 | - | $380,619 | $5,075 | $137,023 |
| 48" Gravity | Prior to 1932 | 660 | l.f. | - | - | - | - | $0 |
| 30" Forcemain (C.I.) | 1959 | 4665 | l.f. | $46 | - | $212,957 | $2,839 | $76,665 |
| | | | | | | | **Total** | **$350,000** |

# Broome County Financial Feasibility Study
## Village of Endicott
## Asset Valuation
## Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Miscellaneous Equipment** | | | | | | | | |
| Pickup Truck | 2002 | 1 | ea. | - | - | - | - | $8,700 |
| Pickup Truck | 1996 | 1 | ea. | - | - | - | - | $4,500 |
| Pickup Truck | 2006 | 2 | ea. | - | - | - | - | $38,000 |
| Dump Truck | 1985 | 1 | ea. | - | - | - | - | $5,000 |
| Dump Truck | 1989 | 1 | ea. | - | - | - | - | $8,000 |
| Dump Truck | 1991 | 1 | ea. | - | - | - | - | $10,000 |
| Front End Loader | 1988 | 1 | ea. | - | - | - | - | $16,000 |
| Front End Loader | 2003 | 1 | ea. | - | - | - | - | $88,500 |
| Front End Loader | 2003 | 1 | ea. | - | - | - | - | $20,000 |
| Spreader | 1990 | 1 | ea. | - | - | - | - | $12,000 |
| Utility Vehicle | 1995 | 1 | ea. | - | - | - | - | $1,000 |
| Forklift | 1983 | 1 | ea. | - | - | - | - | $5,500 |
| Lawn Mower | 2002 | 1 | ea. | - | - | - | - | $6,500 |
| | | | | | | | **Total** | **$220,000** |

| **Grand Total** | **$9,800,000** |
|---|---|

Notes:

1. Straight Line Depreciation: Dj = (C-Sn)/n

| | | |
|---|---|---|
| n = | 20 | years (Equipment) |
| n = | 50 | years (Buildings & Structures) |
| n = | 75 | years (Piping) |

* Items beyond their useful life were assigned a value of zero.

2. Primary Clarifiers estimated based on cost of Secondary Clarifiers due to similarity in size.
3. Circular secondary clarifiers.
4. Rectangular secondary clarifiers.
5. Thickener cost based on secondary clarifier cost from 1971 multiplied by ratio of thickener size to clarifiers
6. Item is considered a lost cost (no value).

| Abbreviations | |
|---|---|
| ea. | Each |
| l.f. | Linear Foot |
| l.s. | Lump Sum |
| sq. ft. | Square Foot |

# Broome County Financial Feasibility Study
## Town of Chenango
## Asset Valuation
## Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Wastewater Treatment Plant Buildings** | | | | | | | | |
| Control Building | 1991 | 3330 | sq. ft. | $250 | $832,500 | $510,813 | $10,216 | $347,353 |
| Composting Building | 1993 | 14400 | sq. ft. | $250 | $3,600,000 | $2,380,393 | $47,608 | $1,713,883 |
| 1997 Facility Upgrades<br>- Composting Facility Addition<br>- Blower Room<br>- Control Room<br>- Belt Filter Press Room | 1997 | 1 | l.s. | $853,000 | - | $853,000 | $17,060 | $682,400 |
| | | | | | | | **Total** | **$2,743,636** |
| **Wastewater Treatment Plant Tankage** | | | | | | | | |
| Parshall Flume (6", 4 MGD) | 1993 | 1 | ea | $8,000 | $8,000 | $5,290 | $106 | $3,809 |
| Aeration Tanks (64'x20'x19') | 1993 | 2 | ea | $500,000 | $1,000,000 | $661,220 | $13,224 | $476,079 |
| Sludge Holding Tanks (30' x 10') | 1990 | 2 | ea | $80,000 | $160,000 | $96,080 | $1,922 | $63,412 |
| Comptainer System (Comploader) | 2001 | 1 | l.s. | $200,000 | - | $200,000 | $4,000 | $176,000 |
| | | | | | | | **Total** | **$719,300** |
| **Wastewater Treatment Plant Equipment** | | | | | | | | |
| Channel Monster | 2007 | 1 | ea | $130,000 | - | $130,000 | $6,500 | $130,000 |
| RAS Pumps (1.5 hp, 200 gpm) | 2005 | 1 | ea | $20,000 | $20,000 | $18,898 | $945 | $17,009 |
| - Recessed Impeller | 2006 | 1 | ea | $20,000 | $20,000 | $19,673 | $984 | $18,689 |
| Aeration Blowers (2-50 hp) | 1993 | 2 | ea | $40,000 | $80,000 | $52,898 | $2,645 | $15,869 |
| (2-10 hp) | 1993 | 2 | ea | $20,000 | $40,000 | $26,449 | $1,322 | $7,935 |
| Aeration Equipment<br>(blowers & accessories) | 1997 | 1 | l.s. | $210,000 | | $210,000 | $10,500 | $105,000 |
| WAS Pumps (Air Lift, 200 gpm) | 1993 | 2 | ea | $10,000 | $20,000 | $13,224 | $661 | $3,967 |
| Belt Filter Press<br>(100 gpm, 17% solids) | 1993 | 1 | ea | $225,000 | $225,000 | $148,775 | $7,439 | $44,632 |
| Polymer Pump (5 gpm) | 1993 | 1 | ea | $5,000 | $5,000 | $3,306 | $165 | $992 |
| Power Screen (30 hp) | 1993 | 1 | ea | $50,000 | $50,000 | $33,061 | $1,653 | $9,918 |
| | | | | | | | **Total** | **$354,012** |

# Broome County Financial Feasibility Study
# Town of Chenango
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Wastewater Treatment Plant Miscellaneous** | | | | | | | | |
| Electrical Upgrades | 1997 | 1 | l.s. | $92,500 | - | $92,500 | $1,850 | $74,000 |
| | | | | | | | **Total** | **$74,000** |
| **Pump Stations** | | | | | | | | |
| Unknown (6" FM) | 1992 | 1 | l.s. | $40,000 | - | $40,000 | $533 | $32,000 |
| Unknown (6" FM) | 1992 | 1 | l.s. | $40,000 | - | $40,000 | $533 | $32,000 |
| WWTP Lift Station (6" FM, 0.8 MGD) | 1997 | 1 | l.s. | $600,000 | $600,000 | $443,533 | $22,177 | $221,767 |
| | | | | | | | **Total** | **$285,767** |
| **Collection System** | | | | | | | | |
| 12" Gravity | 1988 | 7200 | l.f. | $30 | - | $216,000 | $2,880 | $161,280 |
| 6" Force Main | 1988 | 3300 | l.f. | $21 | - | $69,300 | $924 | $51,744 |
| | | | | | | | **Total** | **$213,024** |
| **Miscellaneous Equipment** | | | | | | | | |
| Pickup Truck | 2005 | 1 | ea. | - | - | - | - | $17,000 |
| Pickup Truck | 2002 | 1 | ea. | - | - | - | - | $8,500 |
| Pickup Truck | 2000 | 1 | ea. | - | - | - | - | $6,000 |
| Front End Loader | - | 1 | ea. | - | - | - | - | $58,500 |
| Mack Roll-Off Truck | 1984 | 1 | ea. | - | - | - | - | $19,500 |
| | | | | | | | **Total** | **$109,500** |

| **Grand Total** | **$4,500,000** |
|---|---|

Notes:

1. Straight Line Depreciation: Dj = (C-Sn)/n

| | | |
|---|---|---|
| n = | 20 | years (Equipment) |
| n = | 50 | years (Buildings & Structures) |
| n = | 75 | years (Piping) |

* Items beyond their useful life were assigned a value of zero.

| Abbreviations | |
|---|---|
| ea. | Each |
| l.f. | Linear Foot |
| l.s. | Lump Sum |
| sq. ft. | Square Foot |

# Broome County Financial Feasibility Study
# City of Binghamton
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Pump Stations** | | | | | | | | |
| Pennsylvania Ave | | | | | | | | |
| General | 2004 | 1 | l.s. | $990,000 | - | $990,000 | $19,800 | $930,600 |
| Electrical | 2004 | 1 | l.s. | $490,000 | - | $490,000 | $9,800 | $460,600 |
| HVAC | 2004 | 1 | l.s. | $155,000 | - | $155,000 | $3,100 | $145,700 |
| Front Street | | | | | | | | |
| General | 2006 | 1 | l.s. | $490,000 | - | $490,000 | $9,800 | $480,200 |
| Electrical | 2006 | 1 | l.s. | $182,000 | - | $182,000 | $3,640 | $178,360 |
| HVAC | 2006 | 1 | l.s. | $60,000 | - | $60,000 | $1,200 | $58,800 |
| | | | | | | | **Total** | **$2,254,260** |
| **Collection System** | | | | | | | | |
| CSO 1 | | | | | | | | |
| General | 2004 | 1 | l.s. | $170,000 | - | $170,000 | $3,400 | $159,800 |
| Electrical | 2004 | 1 | l.s. | $80,000 | - | $80,000 | $1,600 | $75,200 |
| CSO 2 | | | | | | | | |
| General | 2004 | 1 | l.s. | $315,000 | - | $315,000 | $6,300 | $296,100 |
| Electrical | 2004 | 1 | l.s. | $97,000 | - | $97,000 | $1,940 | $91,180 |
| CSO 3 | | | | | | | | |
| General | 2004 | 1 | l.s. | $180,000 | - | $180,000 | $3,600 | $169,200 |
| Electrical | 2004 | 1 | l.s. | $63,000 | - | $63,000 | $1,260 | $59,220 |
| CSO 4 | | | | | | | | |
| General | 2004 | 1 | l.s. | $380,000 | - | $380,000 | $7,600 | $357,200 |
| Electrical | 2004 | 1 | l.s. | $102,000 | - | $102,000 | $2,040 | $95,880 |
| CSO 5 | | | | | | | | |
| General | 2004 | 1 | l.s. | $330,000 | - | $330,000 | $6,600 | $310,200 |
| CSO 6 | | | | | | | | |
| General | 2004 | 1 | l.s. | $20,000 | - | $20,000 | $400 | $18,800 |
| CSO 7 | | | | | | | | |
| General | 2004 | 1 | l.s. | $25,000 | - | $25,000 | $500 | $23,500 |
| CSO 9 | | | | | | | | |
| General | 2004 | 1 | l.s. | $23,000 | - | $23,000 | $460 | $21,620 |
| Electrical | 2004 | 1 | l.s. | $20,000 | - | $20,000 | $400 | $18,800 |
| CSO 13 | | | | | | | | |
| General | 2004 | 1 | l.s. | $93,000 | - | $93,000 | $1,860 | $87,420 |
| Electrical | 2004 | 1 | l.s. | $45,000 | - | $45,000 | $900 | $42,300 |

# Broome County Financial Feasibility Study
# City of Binghamton
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| 8" V.T. Sewer | Prior to 1932 | 6400 | l.f. | - | - | - | - | $0 |
| 8" Sewer | Prior to 1932 | 4935 | l.f. | - | - | - | - | $0 |
| 10" V.T. Sewer | 1958 | 3000 | l.f. | $70 | $210,000 | $20,227 | $270 | $7,012 |
| 10" Sewer | Prior to 1932 | 7250 | l.f. | - | - | - | - | $0 |
| 12" Sewer | Prior to 1932 | 5800 | l.f. | - | - | - | - | $0 |
| 15" V.T. Sewer | 1958 | 1175 | l.f. | $80 | $94,000 | $9,054 | $121 | $3,139 |
| 15" Sewer | Prior to 1932 | 2850 | l.f. | - | - | - | - | $0 |
| | 1958 | 3400 | l.f. | $80 | $272,000 | $26,199 | $349 | $9,082 |
| | 1983 | 2150 | l.f. | $80 | $172,000 | $88,758 | $1,183 | $60,355 |
| 16" Sewer | Prior to 1932 | 250 | l.f. | - | - | - | - | $0 |
| 18" V.T. Sewer | 1958 | 1100 | l.f. | $100 | $110,000 | $10,595 | $141 | $3,673 |
| 18" Sewer | Prior to 1932 | 5700 | l.f. | - | - | - | - | $0 |
| | 1983 | 4400 | l.f. | $100 | $440,000 | $227,054 | $3,027 | $154,397 |
| 20" Sewer | Prior to 1932 | 1000 | l.f. | - | - | - | - | $0 |
| 24" C.I.P. Sewer | 1958 | 4050 | l.f. | $150 | $607,500 | $58,514 | $780 | $20,285 |
| 24" Sewer | Prior to 1932 | 2225 | l.f. | - | - | - | - | $0 |
| 28" Sewer | Prior to 1932 | 550 | l.f. | - | - | - | - | $0 |
| 30" R.C.P. Sewer | Prior to 1932 | 4700 | l.f. | - | - | - | - | $0 |
| 30" Sewer | 1958 | 1500 | l.f. | $200 | $300,000 | $28,896 | $385 | $10,017 |
| | 1983 | 2055 | l.f. | $200 | $411,000 | $212,089 | $2,828 | $144,221 |
| 30" River Crossing | 1958 | 3000 | l.f. | $200 | $600,000 | $57,792 | $771 | $20,035 |
| 33" Sewer | 1958 | 6275 | l.f. | $200 | $1,255,000 | $120,881 | $1,612 | $41,906 |
| 34" Sewer | 1958 | 550 | l.f. | $200 | $110,000 | $10,595 | $141 | $3,673 |
| 36" C.I.P. Sewer | 1958 | 2000 | l.f. | $200 | $400,000 | $38,528 | $514 | $13,356 |
| 36" R.C.P. Sewer | 1958 | 4650 | l.f. | $200 | $930,000 | $89,577 | $1,194 | $31,054 |
| 38" Sewer | 1958 | 2075 | l.f. | $200 | $415,000 | $39,973 | $533 | $13,857 |
| 42" Sewer | 1958 | 3400 | l.f. | $250 | $850,000 | $81,872 | $1,092 | $28,382 |
| 45" R.C.P. Sewer | 1958 | 9750 | l.f. | $250 | $2,437,500 | $234,780 | $3,130 | $81,390 |
| 48" R.C.P. Sewer | 1958 | 300 | l.f. | $250 | $75,000 | $7,224 | $96 | $2,504 |
| 54" Sewer | 1958 | 4350 | l.f. | $300 | $1,305,000 | $125,697 | $1,676 | $43,575 |

# Broome County Financial Feasibility Study
# City of Binghamton
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| 2'x3' Sewer | Prior to 1932 | 2,470 | l.f. | - | - | - | - | $0 |
| 18"x27" Sewer | Prior to 1932 | 1,450 | l.f. | - | - | - | - | $0 |
| 20"x30" Sewer | Prior to 1932 | 2,800 | l.f. | - | - | - | - | $0 |
| 16"x33" Sewer | Prior to 1932 | 800 | l.f. | - | - | - | - | $0 |
| 24"x26" Sewer | Prior to 1932 | 1,875 | l.f. | - | - | - | - | $0 |
| 28"x42" Sewer | Prior to 1932 | 4,800 | l.f. | - | - | - | - | $0 |
| 36"x42" Sewer | Prior to 1932 | 1,000 | l.f. | - | - | - | - | $0 |
| 3'x4' Sewer | Prior to 1932 | 6,500 | l.f. | - | - | - | - | $0 |
| 4'x6' Sewer | Prior to 1932 | 5,650 | l.f. | - | - | - | - | $0 |
| | | | | | | | **Total** | **$2,518,333** |

Notes:

1. Straight Line Depreciation: Dj = (C-Sn)/n

| | | |
|---|---|---|
| n = | 20 | years (Equipment) |
| n = | 50 | years (Buildings & Structures) |
| n = | 75 | years (Piping) |

* Items beyond their useful life were assigned a value of zero.

| Abbreviations | |
|---|---|
| ea. | Each |
| l.f. | Linear Foot |
| l.s. | Lump Sum |
| sq. ft. | Square Foot |

| **Grand Total** | **$4,800,000** |
|---|---|

# Broome County Financial Feasibility Study
# Village of Johnson City
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Pump Stations** | | | | | | | | |
| Oakdale Rd | 1986 | 1 | l.s. | $680,000 | - | $680,000 | $13,600 | $394,400 |
| | | | | | | | **Total** | **$394,400** |
| **Collection System** | | | | | | | | |
| CSO #1 & #2 | | | | | | | | |
| General | 2003 | 1 | l.s. | $650,000 | - | $650,000 | $13,000 | $598,000 |
| Electrical | 2003 | 1 | l.s. | $150,000 | - | $150,000 | $3,000 | $138,000 |
| 12" R.C.P. Sewer | 1960 | 640 | l.f. | $70 | $44,800 | $4,685 | $62 | $1,749 |
| 12" Force Main | 1990 | 2610 | l.f. | $25 | - | $65,250 | $870 | $50,460 |
| 15" R.C.P. Sewer | 1990 | 1120 | l.f. | $80 | $89,600 | $53,805 | $717 | $41,609 |
| 24" R.C.P. Sewer | Prior to 1932 | 3640 | l.f. | - | - | - | - | $0 |
| 24" Sewer | 1990 | 1000 | l.f. | $150 | $150,000 | $90,075 | $1,201 | $69,658 |
| 27" R.C.P. Sewer | Prior to 1932 | 9300 | l.f. | - | - | - | - | $0 |
| 30" Force Main | 1960 | 3400 | l.f. | $150 | $510,000 | $53,330 | $711 | $19,910 |
| 48" R.C.P. Sewer | 1950 | 1280 | l.f. | $250 | $320,000 | $20,711 | $276 | $4,971 |
| | | | | | | | **Total** | **$924,356** |

| **Grand Total** | **$1,300,000** |
|---|---|

Notes:

1. Straight Line Depreciation: Dj = (C-Sn)/n

| | | |
|---|---|---|
| n = | 20 | years (Equipment) |
| n = | 50 | years (Buildings & Structures) |
| n = | 75 | years (Piping) |

* Items beyond their useful life were assigned a value of zero.

| Abbreviations | |
|---|---|
| ea. | Each |
| l.f. | Linear Foot |
| l.s. | Lump Sum |
| sq. ft. | Square Foot |

# Broome County Financial Feasibility Study
## Town of Vestal
## Asset Valuation
## Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Pump Stations** | | | | | | | | |
| Castle Gardens | 1975 | 1 | l.s. | $1,500,000 | $1,500,000 | $421,034 | $8,421 | $151,572 |
| Parkway East | 1960 | 1 | l.s. | $600,000 | $600,000 | $62,741 | $1,255 | $3,764 |
| | | | | | | | **Total** | **$155,337** |
| **Collection System** | | | | | | | | |
| 8" Force Main | 1961 | 2500 | l.f. | $50 | $125,000 | $13,436 | $179 | $5,195 |
| 15" Sewer | 1957 | 3200 | l.f. | $80 | $256,000 | $23,521 | $314 | $7,840 |
| 16" Force Main | 1961 | 3400 | l.f. | $100 | $340,000 | $36,546 | $487 | $14,131 |
| 24" Sewer | 1957 | 9500 | l.f. | $150 | $1,425,000 | $130,926 | $1,746 | $43,642 |
| 30" Sewer | 1960 | 7500 | l.f. | $200 | $1,500,000 | $156,853 | $2,091 | $58,558 |
| | | | | | | | **Total** | **$129,367** |

| **Grand Total** | **$280,000** |
|---|---|

Notes:

1. Straight Line Depreciation: Dj = (C-Sn)/n

n = 20 years (Equipment)
n = 50 years (Buildings & Structures)
n = 75 years (Piping)

* Items beyond their useful life were assigned a value of zero.

| Abbreviations | |
|---|---|
| ea. | Each |
| l.f. | Linear Foot |
| l.s. | Lump Sum |
| sq. ft. | Square Foot |

# Broome County Financial Feasibility Study
# Town of Dickinson
# Asset Valuation
# Year Constructed Dollar Value

| ITEM | YEAR CONSTRUCTED [2] | QUANTITY | | CONSTRUCTION COST | | | DEPRECIATION RATE [1] | CURRENT VALUE |
|---|---|---|---|---|---|---|---|---|
| | | NO. UNITS | UNIT MEASURE | PER UNIT | ESTIMATED 2007 | ORIGINAL COST | | |
| **Pump Stations** | | | | | | | | |
| Unknown PS | 1975 | 1 | l.s. | $600,000 | $600,000 | $168,414 | $3,368 | $60,629 |
| | | | | | | | **Total** | **$60,629** |
| **Collection System** | | | | | | | | |
| 8" Sewer | 1975 | 5100 | l.f. | $60 | $306,000 | $85,891 | $1,145 | $49,244 |
| 8" Force Main | 1975 | 1000 | l.f. | $50 | $50,000 | $14,034 | $187 | $8,046 |
| 10" Force Main | 1975 | 2900 | l.f. | $60 | $174,000 | $48,840 | $651 | $28,002 |
| | | | | | | | **Total** | **$85,292** |

| **Grand Total** | **$150,000** |
|---|---|

Notes:

1. Straight Line Depreciation: Dj = (C-Sn)/n

n = 20 years (Equipment)

n = 50 years (Buildings & Structures)

n = 75 years (Piping)

* Items beyond their useful life were assigned a value of zero.

2. The year constructed is an estimate. Dates require verification.

# Broome County Financial Feasibility Study
# Asset Valuation
# ENR Construction Cost Index

| Year | ENRCCI | Annual Change, %/year | | | | |
|---|---|---|---|---|---|---|
| | | 1-Year | 5-Year | 10-Year | 15-Year | 20-Year |
| 1908 | 97 | | | | | |
| 1909 | 91 | -6.2% | | | | |
| 1910 | 96 | 5.5% | | | | |
| 1911 | 93 | -3.1% | | | | |
| 1912 | 91 | -2.2% | | | | |
| 1913 | 100 | 9.9% | 0.6% | | | |
| 1914 | 89 | -11.0% | -0.4% | | | |
| 1915 | 93 | 4.5% | -0.6% | | | |
| 1916 | 130 | 39.8% | 6.9% | | | |
| 1917 | 181 | 39.2% | 14.7% | | | |
| 1918 | 189 | 4.4% | 13.6% | 6.9% | | |
| 1919 | 198 | 4.8% | 17.3% | 8.1% | | |
| 1920 | 251 | 26.8% | 22.0% | 10.1% | | |
| 1921 | 202 | -19.5% | 9.2% | 8.1% | | |
| 1922 | 174 | -13.9% | -0.8% | 6.7% | | |
| 1923 | 214 | 23.0% | 2.5% | 7.9% | 5.4% | |
| 1924 | 215 | 0.5% | 1.7% | 9.2% | 5.9% | |
| 1925 | 207 | -3.7% | -3.8% | 8.3% | 5.3% | |
| 1926 | 208 | 0.5% | 0.6% | 4.8% | 5.5% | |
| 1927 | 206 | -1.0% | 3.4% | 1.3% | 5.6% | |
| 1928 | 207 | 0.5% | -0.7% | 0.9% | 5.0% | 3.9% |
| 1929 | 207 | 0.0% | -0.8% | 0.4% | 5.8% | 4.2% |
| 1930 | 203 | -1.9% | -0.4% | -2.1% | 5.3% | 3.8% |
| 1931 | 181 | -10.8% | -2.7% | -1.1% | 2.2% | 3.4% |
| 1932 | 157 | -13.3% | -5.3% | -1.0% | -0.9% | 2.8% |
| 1933 | 170 | 8.3% | -3.9% | -2.3% | -0.7% | 2.7% |
| 1934 | 198 | 16.5% | -0.9% | -0.8% | 0.0% | 4.1% |
| 1935 | 196 | -1.0% | -0.7% | -0.5% | -1.6% | 3.8% |
| 1936 | 206 | 5.1% | 2.6% | -0.1% | 0.1% | 2.3% |
| 1937 | 235 | 14.1% | 8.4% | 1.3% | 2.0% | 1.3% |
| 1938 | 236 | 0.4% | 6.8% | 1.3% | 0.7% | 1.1% |
| 1939 | 236 | 0.0% | 3.6% | 1.3% | 0.6% | 0.9% |
| 1940 | 242 | 2.5% | 4.3% | 1.8% | 1.0% | -0.2% |
| 1941 | 258 | 6.6% | 4.6% | 3.6% | 1.4% | 1.2% |
| 1942 | 276 | 7.0% | 3.3% | 5.8% | 2.0% | 2.3% |
| 1943 | 290 | 5.1% | 4.2% | 5.5% | 2.3% | 1.5% |
| 1944 | 299 | 3.1% | 4.8% | 4.2% | 2.5% | 1.7% |
| 1945 | 308 | 3.0% | 4.9% | 4.6% | 2.8% | 2.0% |
| 1946 | 346 | 12.3% | 6.0% | 5.3% | 4.4% | 2.6% |
| 1947 | 413 | 19.4% | 8.4% | 5.8% | 6.7% | 3.5% |
| 1948 | 461 | 11.6% | 9.7% | 6.9% | 6.9% | 4.1% |
| 1949 | 477 | 3.5% | 9.8% | 7.3% | 6.0% | 4.3% |

# Broome County Financial Feasibility Study
# Asset Valuation
# ENR Construction Cost Index

| Year | ENRCCI | Annual Change, %/year | | | | |
|---|---|---|---|---|---|---|
| | | 1-Year | 5-Year | 10-Year | 15-Year | 20-Year |
| 1950 | 510 | 6.9% | 10.6% | 7.7% | 6.6% | 4.7% |
| 1951 | 543 | 6.5% | 9.4% | 7.7% | 6.7% | 5.6% |
| 1952 | 569 | 4.8% | 6.6% | 7.5% | 6.1% | 6.6% |
| 1953 | 600 | 5.4% | 5.4% | 7.5% | 6.4% | 6.5% |
| 1954 | 628 | 4.7% | 5.7% | 7.7% | 6.7% | 5.9% |
| 1955 | 660 | 5.1% | 5.3% | 7.9% | 6.9% | 6.3% |
| 1956 | 692 | 4.8% | 5.0% | 7.2% | 6.8% | 6.2% |
| 1957 | 724 | 4.6% | 4.9% | 5.8% | 6.6% | 5.8% |
| 1958 | 759 | 4.8% | 4.8% | 5.1% | 6.6% | 6.0% |
| 1959 | 797 | 5.0% | 4.9% | 5.3% | 6.8% | 6.3% |
| 1960 | 824 | 3.4% | 4.5% | 4.9% | 6.8% | 6.3% |
| 1961 | 847 | 2.8% | 4.1% | 4.5% | 6.2% | 6.1% |
| 1962 | 872 | 3.0% | 3.8% | 4.4% | 5.1% | 5.9% |
| 1963 | 901 | 3.3% | 3.5% | 4.1% | 4.6% | 5.8% |
| 1964 | 936 | 3.9% | 3.3% | 4.1% | 4.6% | 5.9% |
| 1965 | 971 | 3.7% | 3.3% | 3.9% | 4.4% | 5.9% |
| 1966 | 1019 | 4.9% | 3.8% | 3.9% | 4.3% | 5.5% |
| 1967 | 1074 | 5.4% | 4.3% | 4.0% | 4.3% | 4.9% |
| 1968 | 1155 | 7.5% | 5.1% | 4.3% | 4.5% | 4.7% |
| 1969 | 1269 | 9.9% | 6.3% | 4.8% | 4.8% | 5.0% |
| 1970 | 1381 | 8.8% | 7.3% | 5.3% | 5.0% | 5.1% |
| 1971 | 1581 | 14.5% | 9.2% | 6.4% | 5.7% | 5.5% |
| 1972 | 1753 | 10.9% | 10.3% | 7.2% | 6.1% | 5.8% |
| 1973 | 1895 | 8.1% | 10.4% | 7.7% | 6.3% | 5.9% |
| 1974 | 2020 | 6.6% | 9.7% | 8.0% | 6.4% | 6.0% |
| 1975 | 2212 | 9.5% | 9.9% | 8.6% | 6.8% | 6.2% |
| 1976 | 2401 | 8.6% | 8.7% | 8.9% | 7.2% | 6.4% |
| 1977 | 2576 | 7.3% | 8.0% | 9.1% | 7.5% | 6.6% |
| 1978 | 2768 | 7.5% | 7.9% | 9.1% | 7.8% | 6.7% |
| 1979 | 3003 | 8.5% | 8.2% | 9.0% | 8.1% | 6.9% |
| 1980 | 3237 | 7.8% | 7.9% | 8.9% | 8.4% | 7.1% |
| 1981 | 3452 | 6.6% | 7.5% | 8.1% | 8.5% | 7.3% |
| 1982 | 3742 | 8.4% | 7.8% | 7.9% | 8.7% | 7.6% |
| 1983 | 4066 | 8.7% | 8.0% | 7.9% | 8.8% | 7.8% |
| 1984 | 4146 | 2.0% | 6.7% | 7.5% | 8.2% | 7.7% |
| 1985 | 4195 | 1.2% | 5.3% | 6.6% | 7.7% | 7.6% |
| 1986 | 4295 | 2.4% | 4.5% | 6.0% | 6.9% | 7.5% |
| 1987 | 4406 | 2.6% | 3.3% | 5.5% | 6.3% | 7.3% |
| 1988 | 4519 | 2.6% | 2.1% | 5.0% | 6.0% | 7.1% |
| 1989 | 4615 | 2.1% | 2.2% | 4.4% | 5.7% | 6.7% |

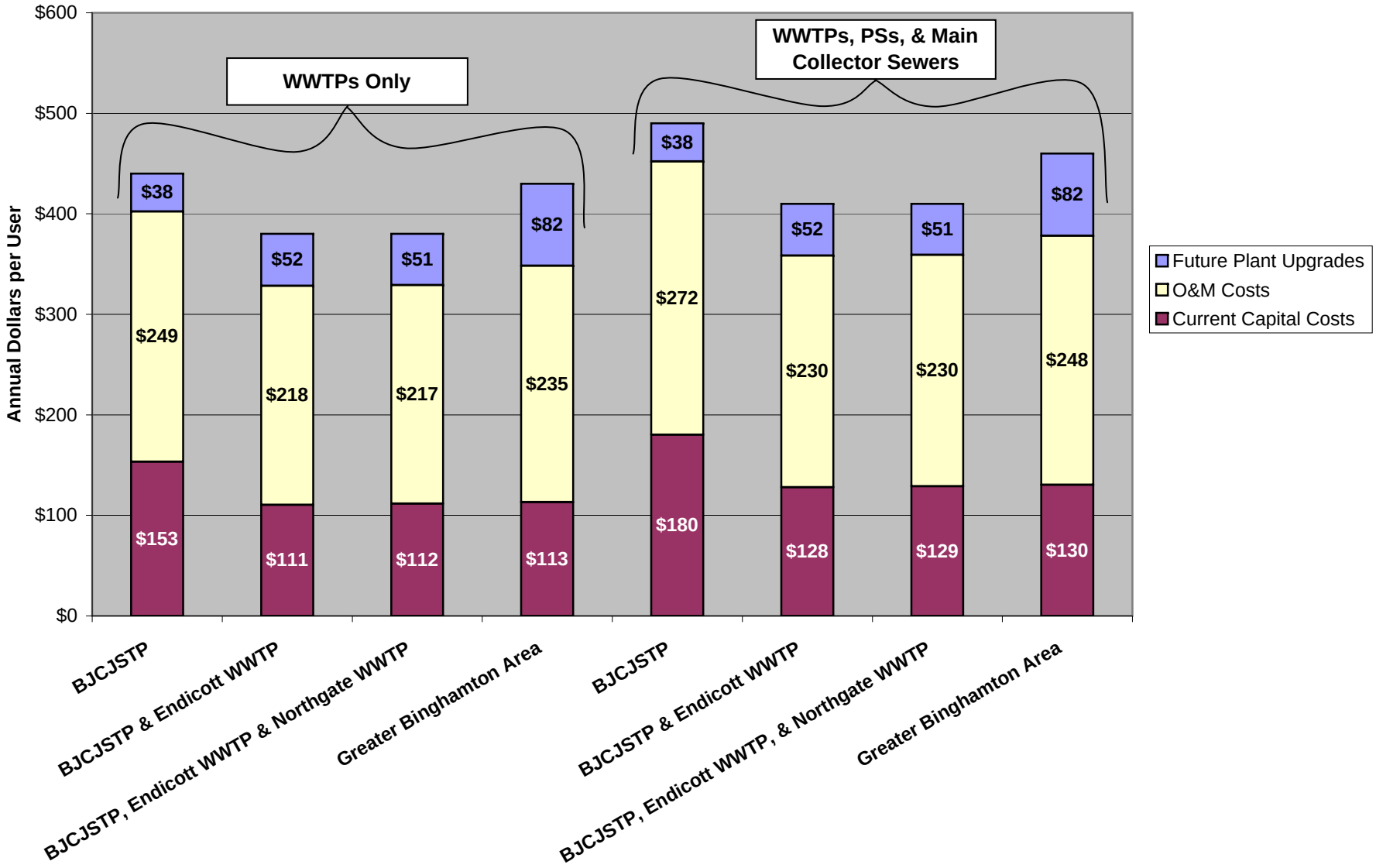
# Broome County Financial Feasibility Study
# Asset Valuation
# ENR Construction Cost Index

| Year | ENRCCI | Annual Change, %/year | | | | |
|---|---|---|---|---|---|---|
| | | 1-Year | 5-Year | 10-Year | 15-Year | 20-Year |
| 1990 | 4732 | 2.5% | 2.4% | 3.9% | 5.2% | 6.4% |
| 1991 | 4835 | 2.2% | 2.4% | 3.4% | 4.8% | 5.7% |
| 1992 | 4985 | 3.1% | 2.5% | 2.9% | 4.5% | 5.4% |
| 1993 | 5210 | 4.5% | 2.9% | 2.5% | 4.3% | 5.2% |
| 1994 | 5408 | 3.8% | 3.2% | 2.7% | 4.0% | 5.0% |
| 1995 | 5471 | 1.2% | 2.9% | 2.7% | 3.6% | 4.6% |
| 1996 | 5618 | 2.7% | 3.0% | 2.7% | 3.3% | 4.3% |
| 1997 | 5825 | 3.7% | 3.2% | 2.8% | 3.0% | 4.2% |
| 1998 | 5920 | 1.6% | 2.6% | 2.7% | 2.5% | 3.9% |
| 1999 | 6059 | 2.3% | 2.3% | 2.8% | 2.6% | 3.6% |
| 2000 | 6221 | 2.7% | 2.6% | 2.8% | 2.7% | 3.3% |
| 2001 | 6342 | 1.9% | 2.5% | 2.8% | 2.6% | 3.1% |
| 2002 | 6538 | 3.1% | 2.3% | 2.7% | 2.7% | 2.8% |
| 2003 | 6695 | 2.4% | 2.5% | 2.5% | 2.7% | 2.5% |
| 2004 | 7115 | 6.3% | 3.3% | 2.8% | 2.9% | 2.7% |
| 2005 | 7446 | 4.7% | 3.7% | 3.1% | 3.1% | 2.9% |
| 2006 | 7751 | 4.1% | 4.1% | 3.3% | 3.2% | 3.0% |
| 2007 | 7880 | January 07' | | | | |
| 2008 | | | | | | |
| 2009 | | | | | | |

# APPENDIX D

## USER COST GRAPHS

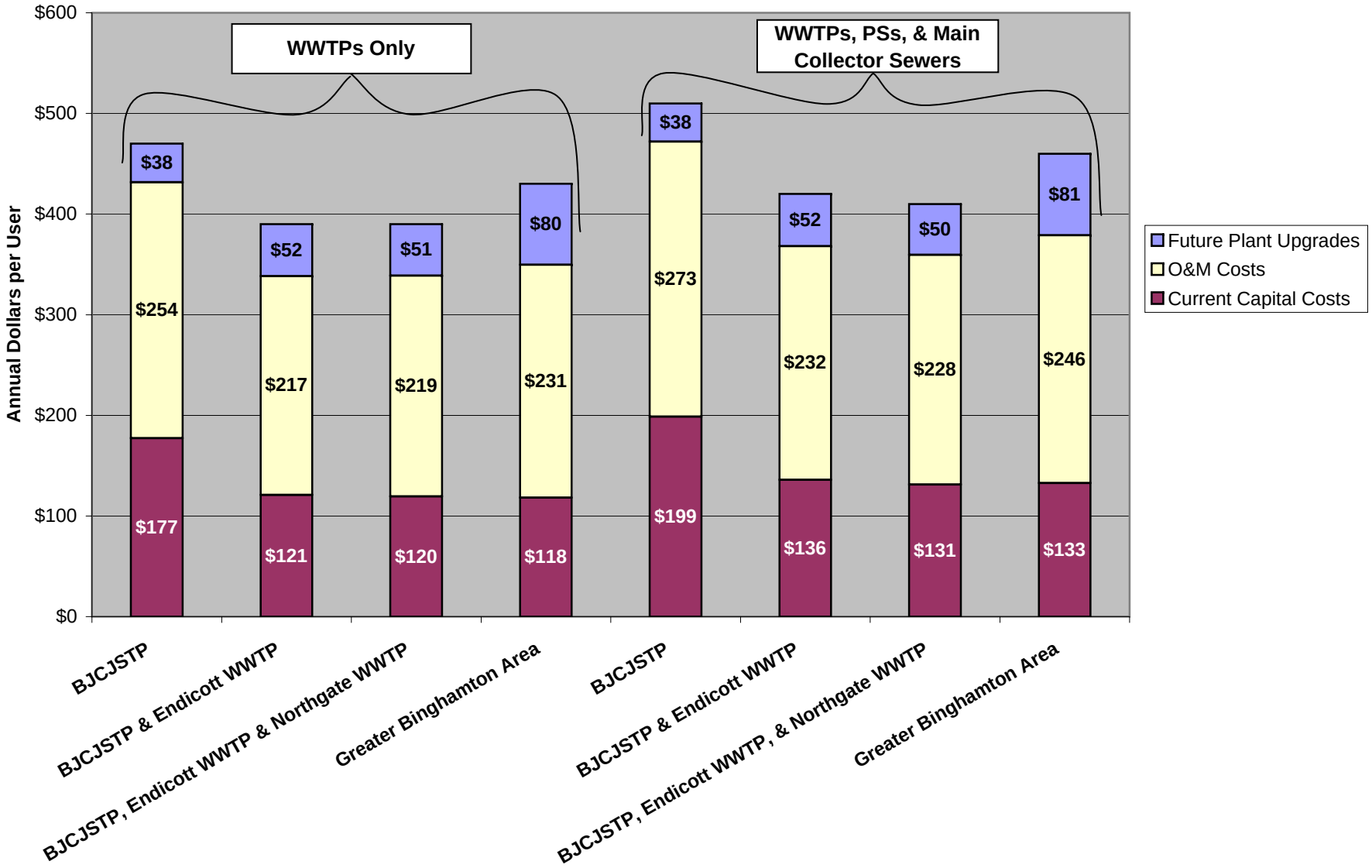
# 20-Year Financing at 5% Interest
# Estimated Future User Fees for County Owned Wastewater Infrastructure
**(Based on "Year Constructed" Dollar Values for Acquisition)**




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
J:\60000\61099\10\Engineering\User Costs rev 10-10-07 (20yr).xls

# 20-Year Financing at 5% Interest
## Estimated Future User Fees for County Owned Wastewater Infrastructure
### (Based on County Acquisition of Municipal Debt)




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
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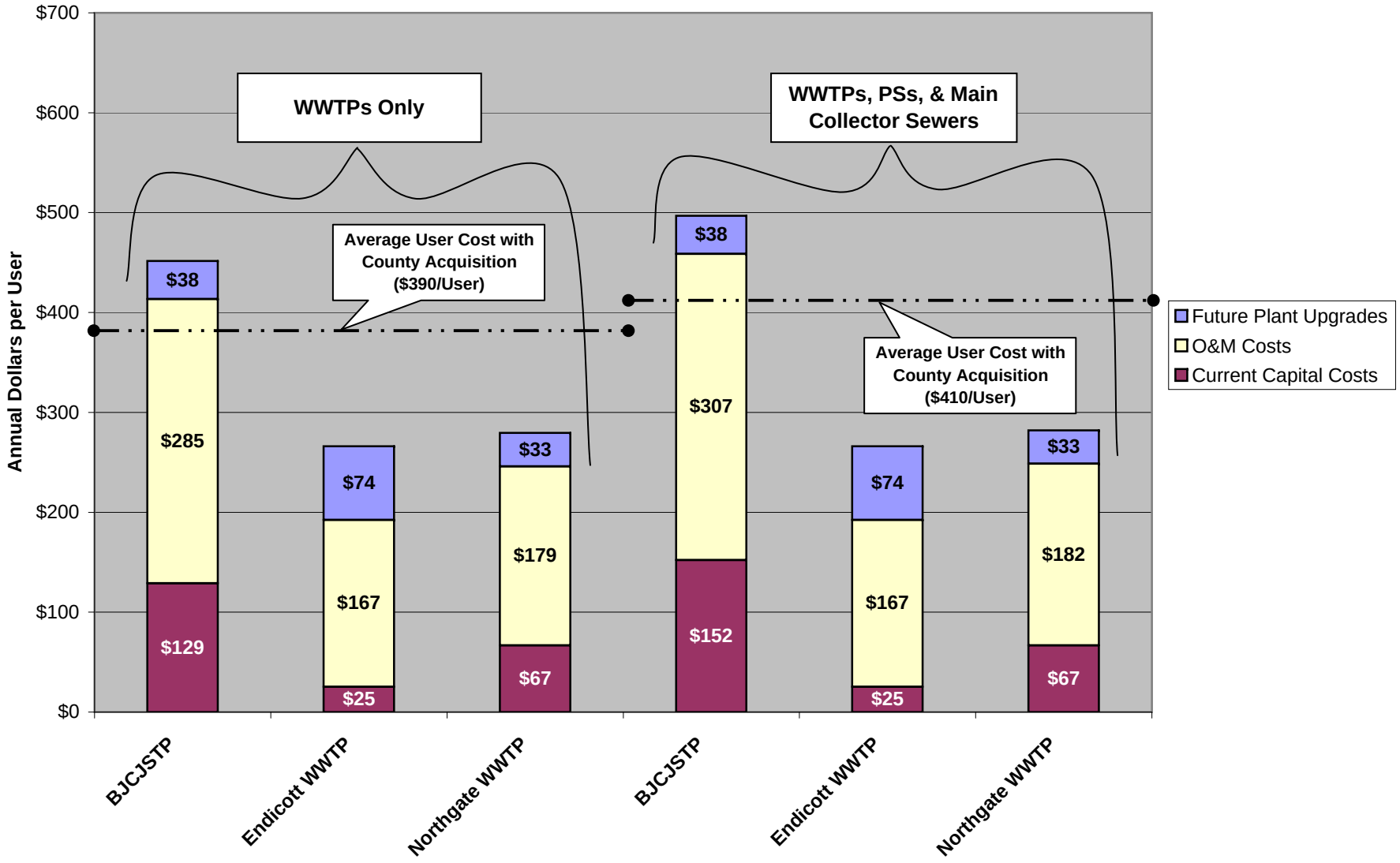
# 20-Year Financing at 5% Interest
# Estimated Future User Fees for Chesapeake Bay Initiative Improvements without County Acquisition of Wastewater Infrastructure

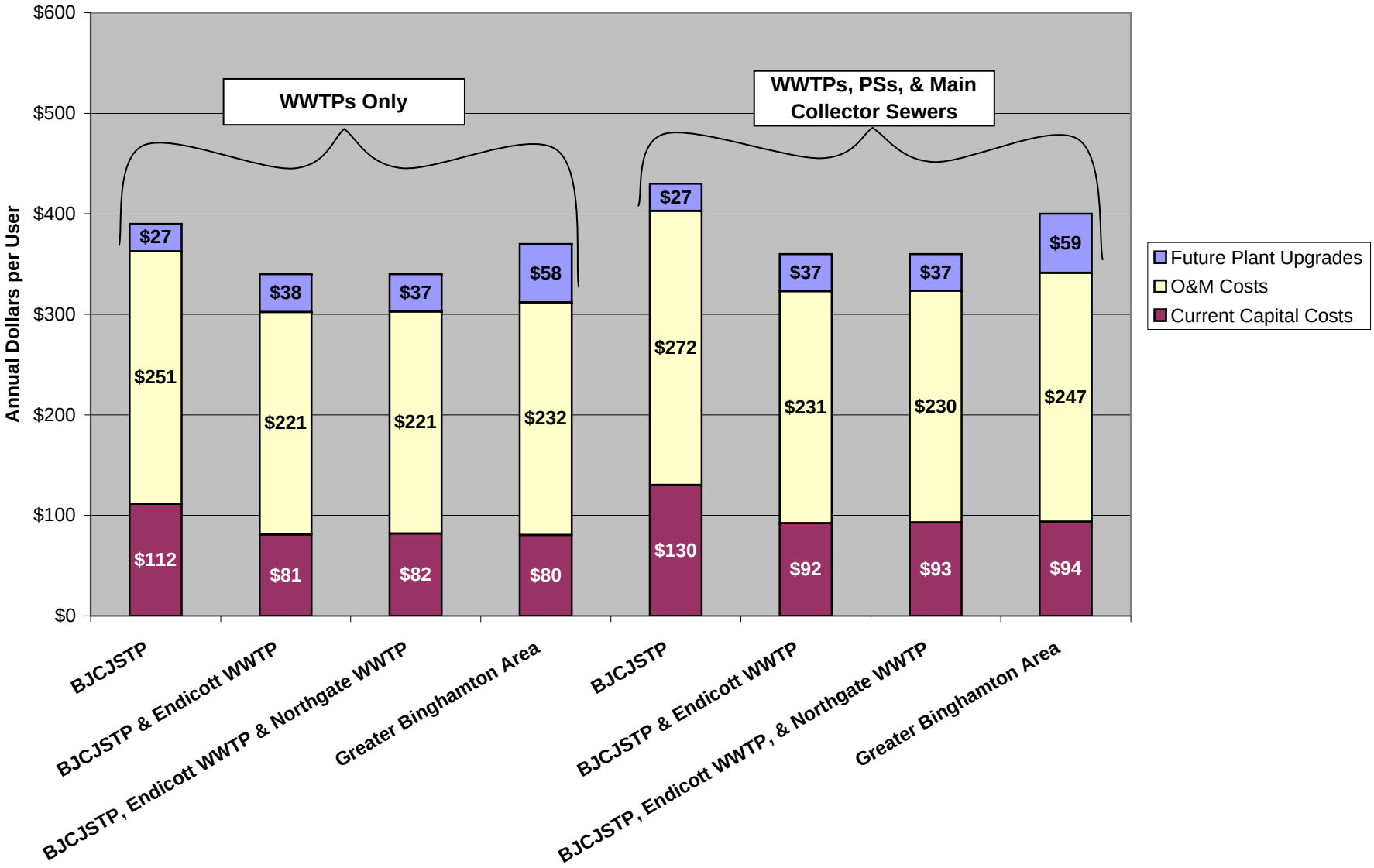
**(Based on current Municipal Debt & estimated future costs for Chesapeake Bay Initiative)**




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
J:\60000\61099\10\Engineering\User Costs rev 10-10-07 (20yr).xls

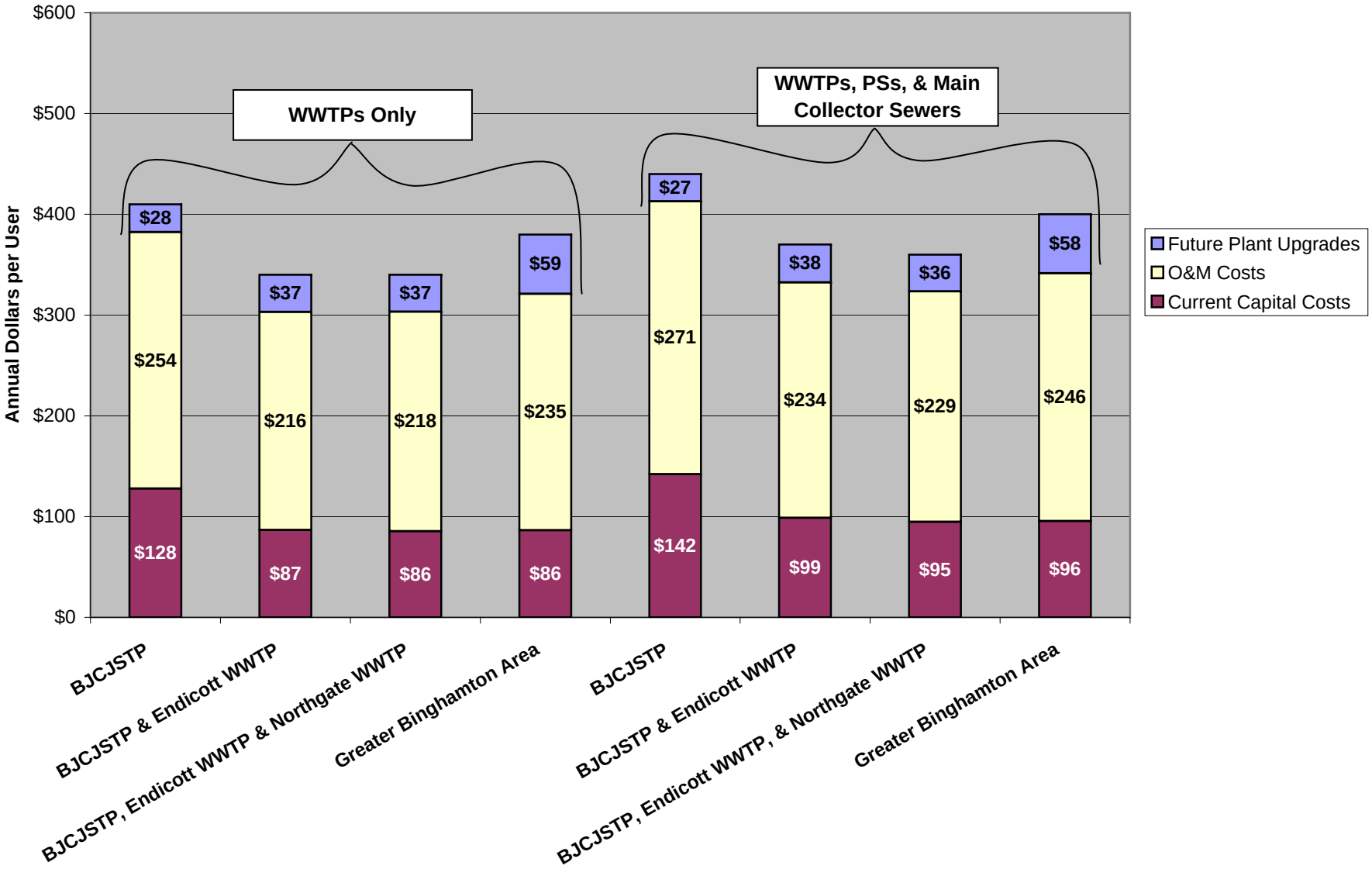
# 30-Year Financing at 4% Interest
# Estimated Future User Fees for County Owned Wastewater Infrastructure
**(Based on "Year Constructed" Dollar Values for Acquisition)**




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
J:\60000\61099\10\Engineering\User Costs rev 10-10-07 (30yr).xls

# 30-Year Financing at 4% Interest
## Estimated Future User Fees for County Owned Wastewater Infrastructure
### (Based on County Acquisition of Municipal Debt)

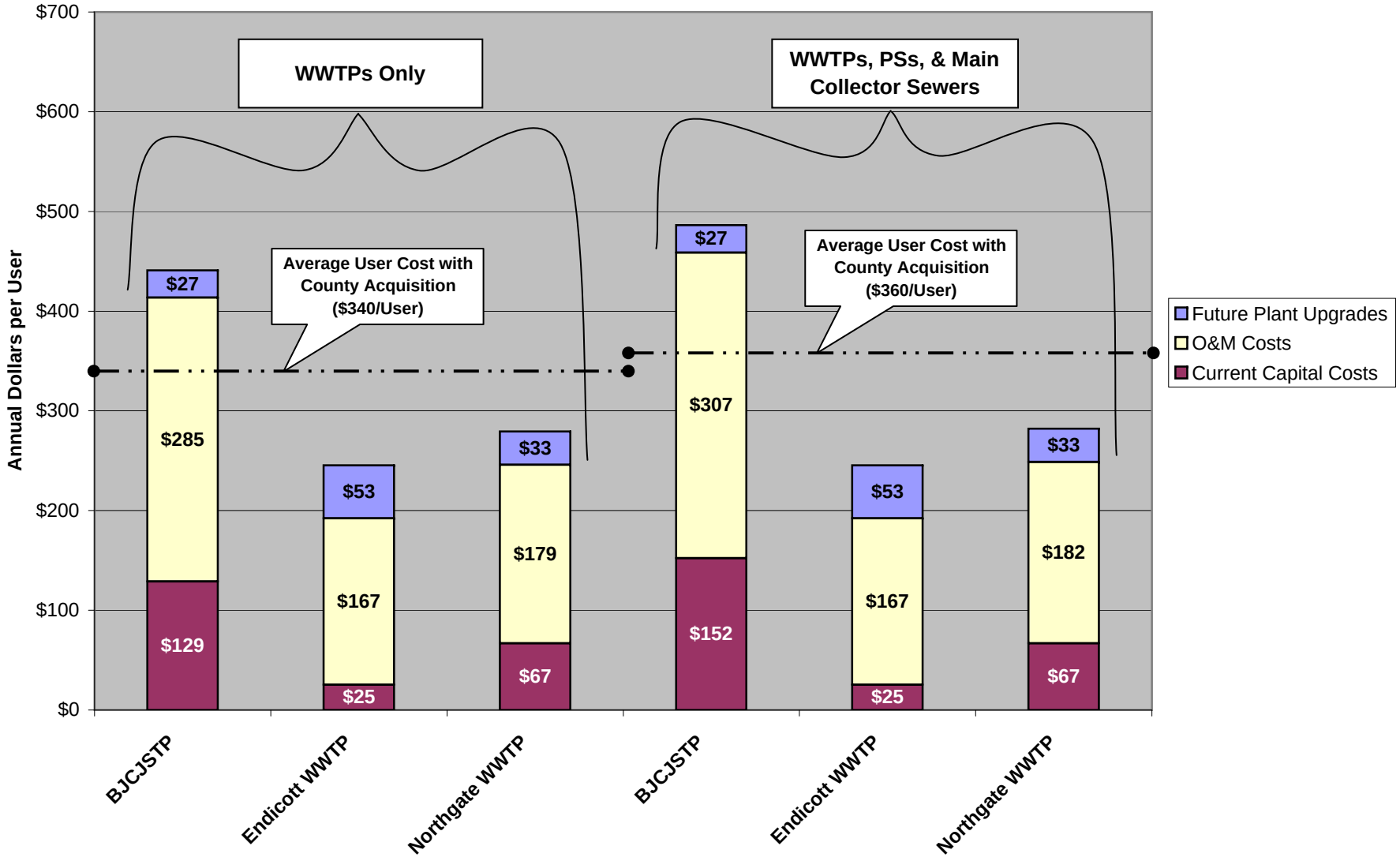



Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
J:\60000\61099\10\Engineering\User Costs rev 10-10-07 (30yr).xls

# 30-Year Financing at 4% Interest
# Estimated Future User Fees for Chesapeake Bay Initiative Improvements without County Acquisition of Wastewater Infrastructure

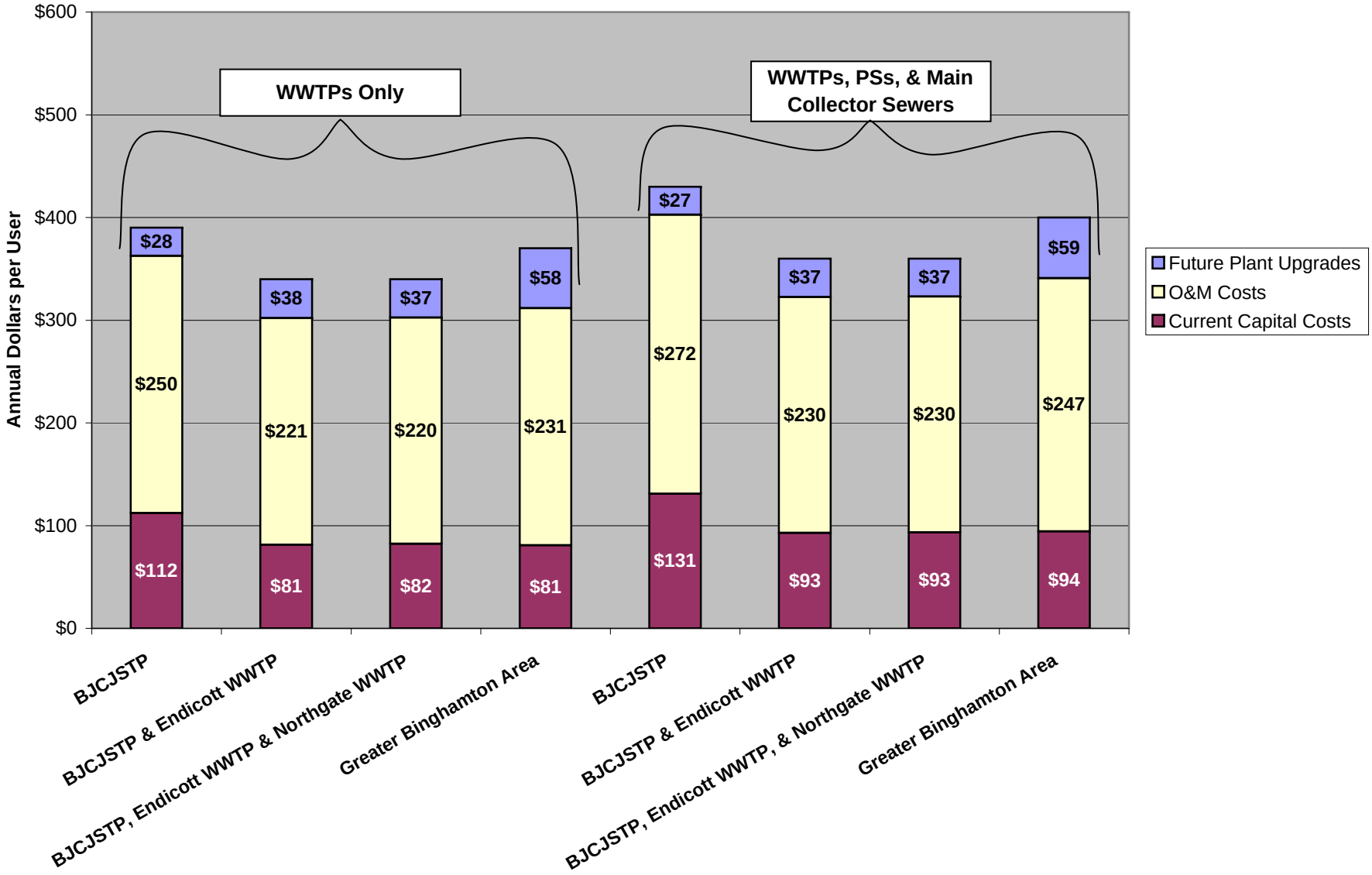
**(Based on current Municipal Debt & estimated future costs for Chesapeake Bay Initiative)**




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
J:\60000\61099\10\Engineering\User Costs rev 10-10-07 (30yr).xls

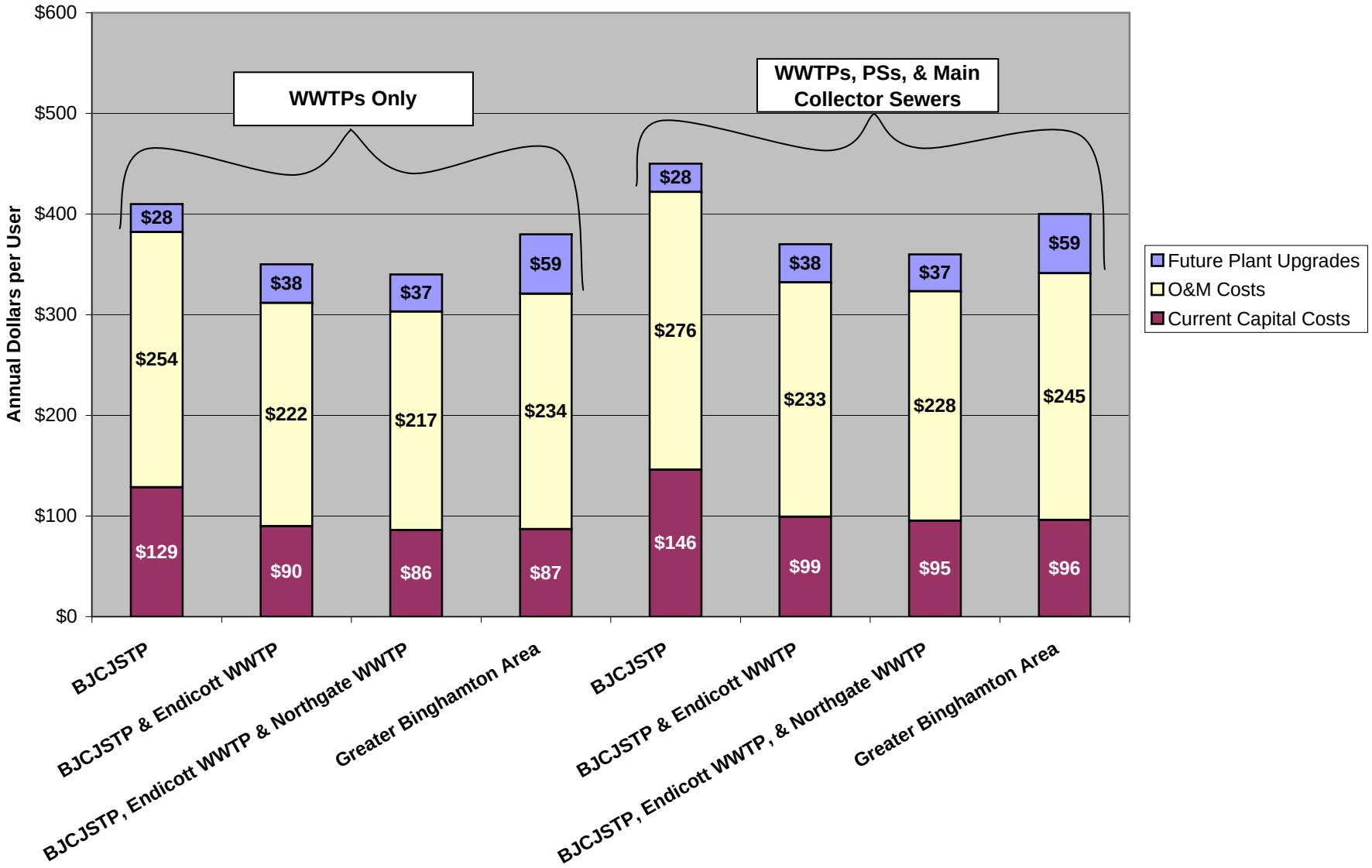
# 40-Year Financing at 5% Interest
## Estimated Future User Fees for County Owned Wastewater Infrastructure
**(Based on "Year Constructed" Dollar Values for Acquisition)**




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
J:\60000\61099\10\Engineering\User Costs rev 10-10-07 (40yr).xls

# 40-Year Financing at 5% Interest
## Estimated Future User Fees for County Owned Wastewater Infrastructure
### (Based on County Acquisition of Municipal Debt)




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
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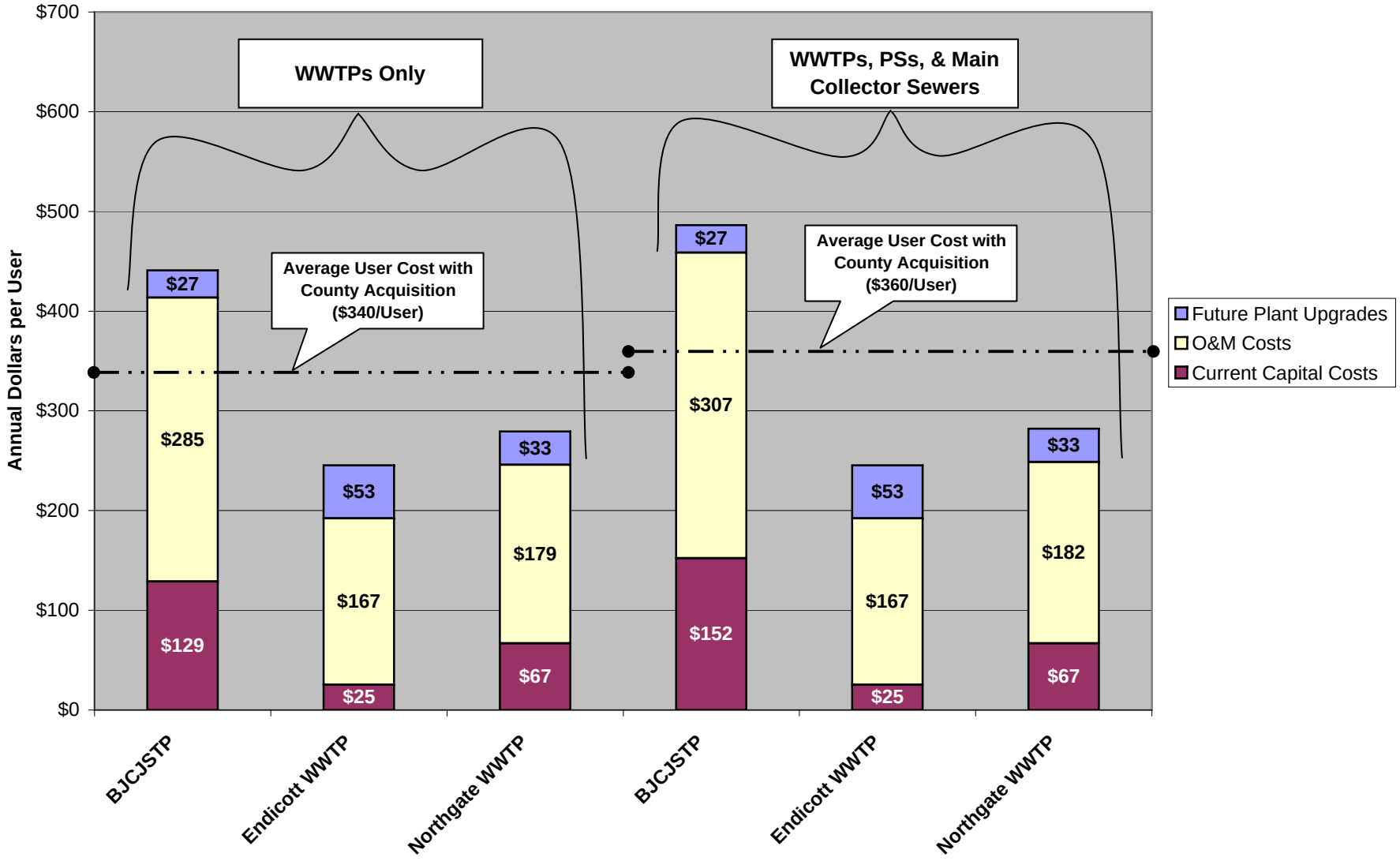
# 40-Year Financing at 5% Interest
# Estimated Future User Fees for Chesapeake Bay Initiative Improvements without County Acquisition of Wastewater Infrastructure

**(Based on current Municipal Debt & estimated future costs for Chesapeake Bay Initiative)**




Stearns & Wheler, LLC
Job No: 61099

Date - 2/4/2008
J:\60000\61099\10\Engineering\User Costs rev 10-10-07 (40yr).xls

# APPENDIX E

## WWTP FLOWS AND LOADS

# Broome County - Financial Feasibility Study

## Wastewater Treatment Plant Data - Flows & Loads

| Facility | Plant Flow (MGD) | | | Biochemical Oxygen Demand Concentration (mg/L) [1] | | | | Total Suspended Solids Concentration (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Maximum 12-Month Rolling Average | Maximum Month | Permit Limit [2] | Annual Average Influent | Annual Average Effluent | Maximum Month Effluent | Permit Limit [3] | Annual Average Influent | Annual Average Effluent | Maximum Month Effluent | Permit Limit [3] |
| **Binghamton-Johnson City Joint STP [4, 5]** | 23.1 | - | 35 | 157 | 105 | 172 | 18 | 141 | 44 | 84 | 20 |
| **Endicott WWTP [6]** | - | 14.0 | 10 | 166 | 8 | 19 | 25 | 231 | 12 | 24 | 30 |
| **Northgate (Chenango) WWTP [7]** | - | 0.94 | 0.8 | 274 | 8 | 13 | 30 | 349 | 6 | 11 | 30 |

Notes:

1. The Binghamton-Johnson City Joint STP and the Endicott WWTP are permitted for $CBOD_5$, while the Northgate WWTP is permitted for $BOD_5$, but the Binghamton-Johnson City Joint STP data presented is for $BOD_5$ as this facility has recently modified their permit from $BOD_5$ to $CBOD_5$.
2. Binghamton-JC Joint STP has a 12-month rolling average permitted flow while the Endicott and Northgate (Chenango) treatment plants each have a maximum monthly permitted flow.
3. All three wastewater treatment plants are permitted for BOD/CBOD and TSS on a maximum month basis.
4. Treatment plant is presently upgrading and is only performing primary treatment at this time. The permit limits presented are for the upgraded Binghamton-Johnson City Joint STP (after completion of the current upgrades).
5. Plant flow, $BOD_5$, and TSS data for the Binghamton-Johnson City Joint STP is as reported on facility DMRs for the time period of November 2003 thru October 2006.
6. Plant flow, $BOD_5$, and TSS data for the Endicott WWTP is as reported on facility DMRs for the time period of December 2003 thru September 2006.
7. Plant flow, $CBOD_5$, and TSS data for the Northgate WWTP is as reported on facility DMRs for the time period of December 2003 thru November 2006.

# Broome County - Financial Feasibility Study

## BINGHAMTON-JOHNSON CITY JOINT SEWAGE TREATMENT PLANT

### Wastewater Treatment Plant Data - Flows & Loads

| Date | Average Flow (MGD) | 12-Month Rolling Average Flow (MGD) | Peak Day Flow (MGD) | Influent Average $BOD_5$ (mg/L) | Effluent Average $BOD_5$ (mg/L) | Percent Removed $BOD_5$ | Influent Average TSS (mg/L) | Effluent Average TSS (mg/L) | Percent Removed TSS | Average Effluent Concentration (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Total Kjeldahl Nitrogen | Ammonia Nitrogen | Total Phosphorus |
| Nov-03 | 21.2 | - | NA | 145 | NA | NA | 135 | 18 | 87% | NA | 9.1 | NA |
| Dec-03 | 21.6 | - | NA | 143 | NA | NA | 128 | 19 | 85% | NA | 7.6 | NA |
| Jan-04 | 22.2 | - | NA | 143 | NA | NA | 125 | 20 | 84% | NA | 12.1 | NA |
| Feb-04 | 22.3 | - | NA | 145 | NA | NA | 120 | 18 | 85% | NA | 14.6 | NA |
| Mar-04 | 23.1 | - | NA | 141 | NA | NA | 117 | 19 | 84% | NA | 9.4 | NA |
| Apr-04 | 23.6 | - | NA | 139 | NA | NA | 121 | 17 | 86% | NA | 10.0 | NA |
| May-04 | 23.3 | - | NA | 142 | NA | NA | 127 | 18 | 86% | NA | 11.8 | NA |
| Jun-04 | 22.1 | - | NA | 150 | NA | NA | 135 | 17 | 87% | NA | 13.7 | NA |
| Jul-04 | 20.1 | - | NA | 167 | 54 | 68% | 149 | 27 | 82% | 16.0 | 13.0 | 2.5 |
| Aug-04 | 21.5 | - | NA | 112 | 91 | 19% | 106 | 50 | 53% | 13.0 | 9.4 | 1.4 |
| Sep-04 | 24.3 | - | NA | 110 | 92 | 16% | 105 | 52 | 50% | 14.2 | 9.0 | 2.0 |
| Oct-04 | 19.5 | 22.0 | NA | 170 | 112 | 34% | 163 | 54 | 67% | 16.5 | 12.1 | 2.9 |
| Nov-04 | 19.3 | 21.9 | NA | 170 | 121 | 29% | 147 | 57 | 61% | 19.3 | 11.7 | 2.5 |
| Dec-04 | 25.5 | 22.2 | NA | 117 | 93 | 21% | 108 | 53 | 51% | 14.0 | 7.0 | 1.8 |
| Jan-05 | 26.1 | 22.5 | NA | 117 | 87 | 26% | 112 | 56 | 50% | 7.4 | 7.4 | 1.9 |
| Feb-05 | 22.9 | 22.6 | NA | 158 | 96 | 39% | 144 | 55 | 62% | 16.0 | 9.0 | 1.8 |
| Mar-05 | 23.1 | 22.6 | NA | 149 | 94 | 37% | 134 | 56 | 58% | 14.0 | 9.2 | 2.0 |
| Apr-05 | 29.5 | 23.1 | NA | 126 | 81 | 36% | 167 | 70 | 58% | 13.0 | 7.0 | 1.9 |
| May-05 | 16.4 | 22.5 | NA | 230 | 137 | 40% | 187 | 61 | 67% | 19.0 | 12.0 | 2.6 |
| Jun-05 | 14.4 | 21.9 | NA | 256 | 172 | 33% | 201 | 70 | 65% | 23.0 | 14.0 | 3.0 |
| Jul-05 | 14.2 | 21.4 | NA | 215 | 140 | 35% | 192 | 64 | 67% | 22.0 | 12.9 | 3.0 |
| Aug-05 | 13.1 | 20.7 | NA | 226 | 149 | 34% | 222 | 84 | 62% | 20.0 | 14.8 | 3.0 |
| Sep-05 | 13.5 | 19.8 | NA | 205 | 141 | 31% | 169 | 81 | 52% | 24.0 | 15.1 | 3.5 |
| Oct-05 | 21.4 | 20.0 | NA | 139 | 98 | 29% | 128 | 68 | 47% | 17.2 | 11.0 | 2.3 |
| Nov-05 | 22.4 | 20.2 | NA | 117 | 76 | 35% | 103 | 44 | 57% | 15.1 | 8.4 | 2.0 |
| Dec-05 | 22.7 | 20.0 | NA | 119 | 87 | 27% | 103 | 47 | 54% | 15.9 | 8.5 | 2.1 |
| Jan-06 | 26.9 | 20.0 | 52.7 | 92 | 70 | 24% | 84 | 46 | 45% | 12.1 | 7.0 | 2.0 |
| Feb-06 | 21.3 | 19.9 | 34.5 | 121 | 78 | 36% | 114 | 46 | 60% | 16.0 | 9.7 | 2.0 |
| Mar-06 | 17.0 | 19.4 | 23.3 | 176 | 108 | 39% | 163 | 56 | 66% | 19.0 | 13.0 | 3.0 |
| Apr-06 | 18.3 | 18.5 | 31.1 | 182 | 107 | 41% | 175 | 36 | 79% | 19.2 | 12.6 | 2.2 |
| May-06 | 16.2 | 18.5 | 22.8 | 200 | 126 | 37% | 147 | 37 | 75% | 22.7 | 13.2 | 2.7 |
| Jun-06 | 19.8 | 18.9 | 34.3 | 174 | 108 | 38% | 143 | 33 | 77% | 16.0 | 9.7 | 2.2 |
| Jul-06 | 20.5 | 19.4 | 33.0 | 147 | 102 | 31% | 159 | 41 | 74% | 12.9 | 7.1 | 2.2 |
| Aug-06 | 19.4 | 19.9 | 42.6 | 183 | 125 | 32% | 148 | 37 | 75% | 16.0 | 9.6 | 2.0 |
| Sep-06 | 19.3 | 20.4 | 35.0 | 181 | 106 | 41% | 173 | 37 | 79% | 15.8 | 10.7 | 2.1 |
| Oct-06 | 21.4 | 20.4 | 39.6 | 161 | 86 | 47% | 139 | 32 | 77% | 17.1 | 10.3 | 1.9 |
| **Average** | **20.8** | **20.8** | **34.9** | **157.4** | **104.9** | **0.3** | **141.5** | **44.3** | **0.7** | **16.7** | **10.6** | **2.3** |
| **Maximum** | **29.5** | **23.1** | **52.7** | **256.0** | **172.0** | **0.7** | **222.0** | **84.0** | **0.9** | **24.0** | **15.1** | **3.5** |

# Broome County - Financial Feasibility Study

## ENDICOTT SEWAGE TREATMENT PLANT

### Wastewater Treatment Plant Data - Flows & Loads

| Date | Average Flow (MGD) | Peak Day Flow (MGD) | Influent Average $CBOD_5$ (mg/L) | Effluent Average $CBOD_5$ (mg/L) | Percent Removed $CBOD_5$ | Influent Average TSS (mg/L) | Effluent Average TSS (mg/L) | Percent Removed TSS | Average Effluent Concentration (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Total Kjeldahl Nitrogen | Ammonia Nitrogen | Nitrate Nitrogen | Total Phosphorus |
| Dec-03 | 9.4 | NA | 190 | 6 | 97% | 220 | 9 | 96% | NA | NA | NA | NA |
| Jan-04 | 6.6 | NA | 120 | 11 | 91% | 160 | 16 | 90% | NA | NA | NA | NA |
| Feb-04 | 5.4 | NA | 180 | 5 | 97% | 180 | 7 | 96% | NA | NA | NA | NA |
| Mar-04 | 14 | NA | 180 | 7 | 96% | 230 | 13 | 94% | NA | NA | NA | NA |
| Apr-04 | 8.2 | NA | 210 | 6 | 97% | 300 | 11 | 96% | NA | NA | NA | NA |
| May-04 | 8.1 | NA | 190 | 8 | 96% | 230 | 19 | 92% | NA | NA | NA | NA |
| Jun-04 | 6.6 | NA | 230 | 10 | 96% | 240 | 22 | 91% | NA | 0.7 | NA | NA |
| Jul-04 | 7.8 | NA | 160 | 10 | 94% | 200 | 24 | 88% | NA | 1.1 | NA | NA |
| Aug-04 | 8.3 | NA | 160 | 6 | 96% | 140 | 8 | 94% | NA | 0.6 | NA | NA |
| Sep-04 | 11 | NA | 150 | 6 | 96% | 230 | 7 | 97% | NA | 0.7 | NA | NA |
| Oct-04 | 6.5 | NA | 200 | 9 | 96% | 230 | 7 | 97% | NA | 0.6 | NA | NA |
| Nov-04 | 7.2 | NA | 150 | 9 | 94% | 240 | 13 | 95% | NA | NA | NA | NA |
| Dec-04 | 11 | NA | 110 | 7 | 94% | 140 | 15 | 89% | NA | NA | NA | NA |
| Jan-05 | 11 | NA | 110 | 5 | 95% | 150 | 12 | 92% | NA | NA | NA | NA |
| Feb-05 | 9.1 | NA | 130 | 5 | 96% | 140 | 5 | 96% | NA | NA | NA | NA |
| Mar-05 | 10 | NA | 140 | 9 | 94% | 360 | 11 | 97% | NA | NA | NA | NA |
| Apr-05 | 12 | NA | 140 | 10 | 93% | 400 | 14 | 97% | NA | NA | NA | NA |
| May-05 | 5.6 | NA | 230 | 15 | 93% | 400 | 22 | 95% | NA | NA | NA | 2.6 |
| Jun-05 | 6.2 | NA | 220 | 8 | 96% | 320 | 10 | 97% | 2.4 | 0.8 | 13.0 | 2.8 |
| Jul-05 | 6.2 | NA | 270 | 7 | 97% | 300 | 10 | 97% | 1.9 | 0.5 | 16.0 | 2.7 |
| Aug-05 | 6.2 | NA | 230 | 6 | 97% | 220 | 8 | 96% | 2.5 | 1.0 | 13.0 | 2.3 |
| Sep-05 | 5.3 | NA | 240 | 7 | 97% | 200 | 6 | 97% | 1.9 | 0.8 | 18.0 | 2.4 |
| Oct-05 | 9.7 | 25.4 | 324 | 7 | 98% | 299 | 13 | 96% | 1.6 | 0.9 | 13.0 | 2.0 |
| Nov-05 | 9.8 | 25.0 | 189 | 14 | 93% | 327 | 11 | 97% | 2.4 | 0.6 | NA | 1.8 |
| Dec-05 | 9.6 | 17.4 | 202 | 19 | 91% | 160 | 13 | 92% | 2.0 | 3.3 | NA | 1.4 |
| Jan-06 | 11.8 | 22.9 | 111 | 8 | 93% | 181 | 11 | 94% | 2.1 | 1.1 | NA | 1.8 |
| Feb-06 | 8.9 | 15.9 | 109 | 5 | 95% | 179 | 11 | 94% | 2.5 | 1.0 | NA | 2.0 |
| Mar-06 | 7.5 | 12.6 | 155 | 5 | 97% | 187 | 11 | 94% | 2.0 | 0.9 | NA | 2.3 |
| Apr-06 | 6.7 | 11.8 | 152 | 5 | 97% | 153 | 10 | 93% | 2.2 | 0.7 | NA | 2.2 |
| May-06 | 5.7 | 7.1 | 97 | 6 | 94% | 231 | 10 | 96% | 2.3 | 0.8 | NA | 2.3 |
| Jun-06 | 7.9 | 18.1 | 75 | 4 | 95% | 188 | 14 | 93% | 2.1 | 0.9 | 14.0 | 2.1 |
| Jul-06 | 9.1 | 17.5 | 55 | 5 | 91% | 147 | 11 | 93% | 1.7 | 0.8 | 10.0 | 1.4 |
| Aug-06 | 6.5 | 12.2 | 113 | 5 | 96% | 320 | 9 | 97% | 2.4 | 0.9 | 13.0 | 1.6 |
| Sep-06 | 6.3 | 11.7 | 134 | 4 | 97% | 249 | 9 | 96% | 3.1 | 1.7 | 16.0 | 2.5 |
| **Average** | **8.3** | **16.5** | **166** | **8** | **95.1%** | **231** | **12** | **94.5%** | **2.2** | **1.0** | **14.0** | **2.1** |
| **Maximum** | **14.0** | **25.4** | **324** | **19** | **97.8%** | **400** | **24** | **97.2%** | **3.1** | **3.3** | **18.0** | **2.8** |

# Broome County - Financial Feasibility Study

## NORTHGATE (CHENANGO) WASTEWATER TREATMENT PLANT

### Wastewater Treatment Plant Data - Flows & Loads

| Date | Average Flow (MGD) | Peak Day Flow (MGD) | Influent Average $BOD_5$ (mg/L) | Effluent Average $BOD_5$ (mg/L) | Percent Removed $BOD_5$ | Influent Average TSS (mg/L) | Effluent Average TSS (mg/L) | Percent Removed TSS | Average Nitrate Nitrogen Concentration (mg/L) | Maximum Effluent Concentration (mg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Total Kjeldahl Nitrogen | Ammonia Nitrogen | Total Phosphorus |
| Dec-03 | 0.60 | NA | 209 | 9 | 96% | 772 | 5 | 99% | NA | 5.5 | 0.9 | NA |
| Jan-04 | 0.52 | NA | 134 | 13 | 90% | 165 | 5 | 97% | NA | 8.1 | 4.7 | NA |
| Feb-04 | 0.48 | NA | 203 | 13 | 94% | 264 | 9 | 97% | NA | 38.6 | 26.4 | NA |
| Mar-04 | 0.57 | NA | 1721 | 6 | 100% | 319 | 10 | 97% | NA | 26.2 | 31.6 | NA |
| Apr-04 | 0.52 | NA | 133 | 6 | 95% | 429 | 11 | 97% | NA | 20.4 | 12.7 | NA |
| May-04 | 0.55 | NA | 113 | 6 | 95% | 219 | 7 | 97% | NA | 21.5 | 8.2 | NA |
| Jun-04 | 0.53 | NA | 119 | 6 | 95% | 312 | 5 | 98% | NA | 5.2 | 0.7 | NA |
| Jul-04 | 0.55 | NA | 68 | 6 | 91% | 222 | 5 | 98% | NA | 4.4 | 0.1 | NA |
| Aug-04 | 0.54 | NA | 123 | 6 | 95% | 187 | 5 | 97% | NA | 2.7 | 0.1 | NA |
| Sep-04 | 0.55 | NA | 98 | 6 | 94% | 176 | 5 | 97% | NA | 2.0 | 0.1 | NA |
| Oct-04 | 0.37 | NA | 211 | 9 | 96% | 255 | 6 | 98% | NA | 3.1 | 0.1 | NA |
| Nov-04 | 0.53 | NA | 79 | 8 | 90% | 179 | 6 | 97% | NA | 3.8 | 0.7 | NA |
| Dec-04 | 0.68 | NA | 545 | 9 | 98% | 194 | 7 | 96% | NA | 5.2 | 2.1 | NA |
| Jan-05 | 0.94 | NA | 136 | 10 | 93% | 252 | 6 | 98% | NA | 6.5 | 4.8 | NA |
| Feb-05 | 0.78 | NA | 764 | 13 | 98% | 351 | 6 | 98% | NA | 17.1 | 14.2 | NA |
| Mar-05 | 0.59 | NA | 204 | 11 | 95% | 273 | 6 | 98% | NA | 18.7 | 17.9 | NA |
| Apr-05 | 0.71 | NA | 207 | 8 | 96% | 159 | 5 | 97% | NA | 14.8 | 12.5 | NA |
| May-05 | 0.58 | NA | 171 | 6 | 96% | 187 | 5 | 97% | NA | 2.8 | 0.4 | 0.3 |
| Jun-05 | 0.59 | NA | 945 | 6 | 99% | 354 | 6 | 98% | 7.4 | 3.2 | 0.4 | 1.6 |
| Jul-05 | 0.55 | NA | 268 | 6 | 98% | 217 | 5 | 98% | 9.8 | 7.7 | 0.8 | 0.9 |
| Aug-05 | 0.57 | NA | 182 | 6 | 97% | 225 | 5 | 98% | 0.2 | 6.4 | 0.2 | 4.0 |
| Sep-05 | 0.67 | NA | 128 | 6 | 95% | 254 | 6 | 98% | 28.1 | 4.9 | 0.1 | 4.4 |
| Oct-05 | 0.75 | NA | 172 | 8 | 95% | 203 | 5 | 98% | NA | 6.6 | 0.2 | NA |
| Nov-05 | 0.67 | NA | 804 | 7 | 99% | 179 | 11 | 94% | 9.3 | 5.8 | 0.4 | NA |
| Dec-05 | 0.66 | 2.45 | 229 | 9 | 96% | 547 | 5 | 99% | 9.8 | 5.6 | 2.8 | 0.8 |
| Jan-06 | 0.71 | 2.84 | 291 | 6 | 98% | 273 | 7 | 97% | 0.2 | 4.6 | 3.0 | 0.3 |
| Feb-06 | 0.61 | 2.56 | 153 | 7 | 95% | 370 | 5 | 99% | 1.8 | 24.1 | 23.3 | 0.4 |
| Mar-06 | 0.54 | 2.88 | 86 | 8 | 91% | 266 | 9 | 97% | 0.3 | 43.6 | 27.3 | 0.8 |
| Apr-06 | 0.54 | 2.48 | 189 | 6 | 97% | 387 | 10 | 97% | 0.7 | 24.6 | 22.6 | 0.5 |
| May-06 | 0.56 | 2.48 | 161 | 5 | 97% | 171 | 5 | 97% | 2.0 | 19.0 | 21.0 | 0.3 |
| Jun-06 | 0.79 | 2.88 | 145 | 6 | 96% | 154 | 6 | 96% | 6.6 | 3.4 | 0.4 | 1.3 |
| Jul-06 | 0.75 | 2.88 | 192 | 6 | 97% | 203 | 5 | 98% | 3.2 | 2.4 | 0.1 | 0.4 |
| Aug-06 | 0.62 | 2.88 | 144 | 6 | 96% | 193 | 5 | 97% | 5.0 | 3.4 | 0.2 | 3.0 |
| Sep-06 | 0.60 | 2.84 | 89 | 6 | 93% | 195 | 5 | 97% | NA | 1.7 | 0.4 | 1.2 |
| Oct-06 | 0.60 | 2.84 | 166 | 10 | 94% | 1177 | 5 | 100% | 18.3 | 3.4 | 0.8 | 2.3 |
| Nov-06 | 0.70 | 2.88 | 295 | 11 | 96% | 2285 | 5 | 100% | 4.7 | 1.5 | 0.3 | 0.2 |
| **Average** | **0.61** | **2.74** | **274.36** | **7.64** | **0.95** | **349.11** | **6.18** | **0.98** | **6.71** | **10.51** | **6.74** | **1.32** |
| **Maximum** | **0.94** | **2.88** | **1721.00** | **13.00** | **1.00** | **2285.00** | **11.00** | **1.00** | **28.10** | **43.60** | **31.60** | **4.40** |

# APPENDIX F

## COST ESTIMATES
## TOWN OF KIRKWOOD AND AIRPORT CORRIDOR

# APPENDIX F

## COST ESTIMATES – TOWN OF KIRKWOOD AND AIRPORT CORRIDOR

### Town of Kirkwood - Wastewater Infrastructure

| DESCRIPTION | TOTAL COST (PRELIMINARY ESTIMATE) |
|---|---|
| **Option One - Sewer to BJCJSTP** (1) | |
| Gravity sewer and force main | $8,200,000 |
| Pumping station | 3,700,000 |
| **TOTAL PROJECT COST** | **$11,900,000** |

| | |
|---|---|
| **Option Two - Package WWTP** (2) | |
| Wastewater treatment plant | $9,700,000 |
| **TOTAL PROJECT COST** | **$9,700,000** |

(1) Length of gravity sewer estimated from City of Binghamton Sanitary Sewer Map (revised 2007) and NYS GIS Aerial Mapping System. Assumes sewer would be run from discharge point of existing force mains coming from the Town of Kirkwood (15- and 18-inch force mains).

(2) Includes site work (excavation, backfill, etc.), WWTP foundation, Administration Building, influent pumping station, equipment, and interconnecting piping and wiring.

## Option One
## Town of Kirkwood - New Sewer to BJCJSTP

| DESCRIPTION | GRAVITY SEWER LINES AND FORCE MAINS (PRELIMINARY ESTIMATE) | PUMPING STATION (PRELIMINARY ESTIMATE) |
|---|---|---|
| Materials and equipment | $5,400,000 | $1,920,000 |
| **SUBTOTAL CAPITAL COSTS** | **$5,400,000** | **$1,920,000** |
| Site work (7%) | - | 130,000 |
| Electrical (15%) | - | 290,000 |
| Instrumentation (5%) | - | 100,000 |
| **SUBTOTAL CAPITAL COSTS** | **$5,400,000** | **$2,440,000** |
| Mobilization/Demobilization (5%) | 270,000 | 120,000 |
| **SUBTOTAL CAPITAL COSTS** | **$5,670,000** | **$2,560,000** |
| Contingency (25%) | 1,400,000 | 640,000 |
| **TOTAL CAPITAL COSTS** | **$7,100,000** | **$3,200,000** |
| Engineering/Legal/Administrative (15%) | 1,100,000 | 480,000 |
| **TOTAL PROJECT COST** | **$8,200,000** | **$3,700,000** |
| **Combined Total Project Cost** | **$11,900,000** | |

## Option Two
## Town of Kirkwood - Packaged Wastewater Treatment Plant

| DESCRIPTION | TOTAL COST (PRELIMINARY ESTIMATE) |
|---|---|
| Package WWTP | $5,050,000 |
| **SUBTOTAL CAPITAL COSTS** | **$5,050,000** |
| Site work (7%) | 350,000 |
| Electrical (15%) | 760,000 |
| Instrumentation (5%) | 250,000 |
| **SUBTOTAL CAPITAL COSTS** | **$6,410,000** |
| Mobilization/Demobilization (5%) | 320,000 |
| **SUBTOTAL CAPITAL COSTS** | **$6,730,000** |
| Contingency (25%) | 1,700,000 |
| **TOTAL CAPITAL COSTS** | **$8,400,000** |
| Engineering/Legal/Administrative (15%) | 1,300,000 |
| **TOTAL PROJECT COST** | **$9,700,000** |

## Airport Corridor - Packaged Wastewater Treatment Plant

| DESCRIPTION | COLLECTION SYSTEM | WWTP |
|---|---|---|
| Materials, equipment, and tankage | $3,400,000 | $1,500,000 |
| **SUBTOTAL CAPITAL COSTS** | **$3,400,000** | **$1,500,000** |
| Site work (7%) | - | 110,000 |
| Electrical (15%) | - | 230,000 |
| Instrumentation (5%) | - | 80,000 |
| **SUBTOTAL CAPITAL COSTS** | **$3,400,000** | **$1,920,000** |
| Mobilization/Demobilization (5%) | 170,000 | 100,000 |
| **SUBTOTAL CAPITAL COSTS** | **$3,570,000** | **$2,020,000** |
| Contingency (25%) | 890,000 | 510,000 |
| **TOTAL CAPITAL COSTS** | **$4,460,000** | **$2,530,000** |
| Engineering/Legal/Administrative (15%) | 670,000 | 380,000 |
| **TOTAL PROJECT COST** | **$5,100,000** | **$2,900,000** |
| **Combined Total Project Cost** | **$8,000,000** | |

# APPENDIX G

## SUMMARY OF SELECTED SEWER AND WATER DISTRICTS OR AUTHORITIES IN NEW YORK STATE

# APPENDIX G

## SUMMARY OF SELECTED SEWER AND WATER DISTRICTS OR AUTHORITIES IN NEW YORK STATE

I. Rockland

A. Rockland County Sewer District #1

a. Board of Commissioners – 13 members

1. Commissioner Kevin P. Connell
2. Commissioner Ted DeGuzman
3. Mayor George O. Darden - Village of Spring Valley
4. Supervisor Alex Gromack (Assist. Chairman) - Town of Clarkstown
5. Supervisor Thom Kleiner - Town of Orangetown
6. Commissioner Seth Lehman
7. Commissioner Brendel Logan
8. Councilman John Maloney - Town of Clarkstown
9. Mayor Brian Miele - Village of Hillburn
10. Trustee Dennis Rose - Village of Sloatsburg
11. Supervisor Christopher P. St. Lawrence - Town of Ramapo
12. Legislator VJ Pradhan - Town of Clarkstown - Leg. Chairman - Budget and Finance Committee
13. Chairman Julius Graifman

b. Relevant Law

Rockland County Sewer Use Law

A local law establishing rules and regulations governing the discharge of sewage, industrial waste, and other waste, into the Rockland County Sewer District No.1, and sewers tributary thereto, providing for the establishment and collection of charges for use of such sewer system and sewers, and prescribing penalties for the violation of such rules and regulations, and does hereby supersede local law number 19 if nineteen hundred and ninety-seven, as amended by local law number three of nineteen hundred seventy-seven, local law number nine of nineteen hundred seventy seven, local law number five of nineteen hundred seventy-eight, local law number two of nineteen hundred eighty-four and local law three of nineteen hundred ninety-three.

II. Onondaga County

A. Metropolitan Water Board

1. Members

a) 7 members of which not more than 5 shall be from the same political party. Chairman of Onondaga County Water Authority is a member; 3 must be City residents (with advice of Mayor) and 2 County residents living outside the City. The Legislature Chairman appoints the Chairperson. Members serve for a 3-year terms.

2. Purpose

a) the Board shall act as the administrative body of the Onondaga County Water District.

B. Onondaga County Water District

1. Board Members

1. Stephen Rogers, Chairman
2. Ferdinand L. Picardi, Vice Chairman
3. David E. Fitch, Administrative Director
4. Robert A. Terrinoni, Asst. Administrative Director
5. Justine P. Bush, Member
6. Terence A.J. Mannion, Member
7. Fernando Ortiz, Member
8. Harold E. Rook, Member
9. Robert F. Tomeny, Member

2. Mission

To purify, store and deliver the required amount of drinking water from Lake Ontario to meet the demands of residential, commercial, institutional and industrial consumers in Onondaga County, the City of Syracuse and Central New York. The Onondaga County Water District, which is administered by the Metropolitan Water Board, serves the role of supplementing the area's primary upland water sources of Skaneateles and Otisco Lakes, which have limited capacities. The Lake Ontario system has the capacity to produce up to 50 million gallons/day and store in excess of 165 million gallons of water for emergencies, including fire protection and periods of drought. The County Water District also provides the community with a means to finance large water system improvements through an ad valorem assessment on real property (when this method is needed).

C. Onondaga County Water Authority

1. Members

a) 5 members appointed for 3-year terms by the Chairman of the County Legislature, with Legislative confirmation.

2. Purpose

a) OCWA is organized as a public benefit corporation and was created in 1951 to engage in the construction, maintenance and operation of a water supply and distribution system for the benefit of the people of Onondaga County.

3. Board members

1) Robert Tomeny Chairman
2) Thomas Pasqua, Attorney
3) Holly Rosenthal, Treasurer
4) Wayne Simmons, Secretary

5) Claude Incaudo, Board Member
6) Anthony J. Geiss, Jr., PE, Deputy Executive Director
7) Michael E. Hooker, Executive Director
8) Fred Picardi, Vice Chairman

III. Erie County

A. Division of Sewerage Management (DSM)

1. 7 Erie County Sewer Districts

a. Responsible for the construction and maintenance of sanitary sewer systems and wastewater treatment facilities

b. The ECSD are governed by Boards of Managers appointed by the County Executive and confirmed by the Erie County Legislature.

c. The ECSD are self-supporting entities with the power to assess appropriate service fees and levy local sewer charges. Capital construction is eligible for both federal and state aid when available. At present, only low interest loans are available.

d. Rules and Regulations of an Erie County Sewer District (27 page doc)

2. Member of Board of Managers for Erie County Sewer District #5

a. Daniel A. Herberger, Supervisor, Town of Clarence

IV. Orange County

A. Orange County Water Authority

1. Board of Directors

1) Marcia Jacobowitz, Esq., Chairwoman
2) Thomas DeBenedictus, Treasurer
   a. Accountant, Chamber of Commerce of Orange County, Inc. Newburgh NY—Director Emeritus
3) Jonah Mandelbaum
   a. Real Estate Developer
4) R Michael Worden
   a. Former Mayor of Port Jervis, NY
5) Daniel E. Patenaude, P.E
   a. Vice-President New York Bituminous Products Corp.
6) David Church, AICP - Interim Executive Director, Commissioner of Planning, County of Orange

3. Purpose

OCWA was created to address the long-term water needs of Orange County, New York. OCWA and 38 other communities in the county are Groundwater Guardians.

V. Suffolk County
- A. Suffolk County Water Authority
  - 1. Board Members
    1) Michael A. LoGrande, Chairman
       a. Former Suffolk County Executive, and Supervisor of the Town of Islip
    2) Bernard Brady, Secretary
       a. high school business teacher
    3) George Proios
       a. Chief Environmental Analyst for Suffolk County and Chairman of the County's Soil and Water Conservation District
    4) Patrick G. Halpin
       a. Former Suffolk County Executive and NYS Assemblyman
    5) Michael Deering
       a. Vice President for Government Affairs of the Long Island Association, former Commissioner of Suffolk County's Department of Environment and Energy
  - 2. History
    1) New York State's first public benefit corporation for water service began operations on June 1, 1951
    2) The new not-for-profit entity has since become the model for numerous other water authorities
- B. Suffolk County Sewer Agency
- C. Suffolk County Sewer Districts

VI. Nassau County
- A. Nassau County Sewer and Storm Water Finance Authority (NCSSWFA)
- B. Nassau County Sewer Districts
- C. Long Island American Water
- D. Water Authority of Western Nassau County

# APPENDIX H

# GLOSSARY OF TERMS

# APPENDIX H

## GLOSSARY OF TERMS

**BAF** – Biological aerated filter

**Biochemical Oxygen Demand (BOD)** – Measurement of the dissolved oxygen required by microorganisms in the biochemical oxidation of the organic matter contained in the wastewater.

**BJCJSB** – Binghamton-Johnson City Joint Sewage Board

**BJCJSTP** – Binghamton-Johnson City Joint Sewage Treatment Plant

**Carbonaceous Biochemical Oxygen Demand** (**CBOD) –** Measurement of the dissolved oxygen required by microorganisms in the biochemical oxidation of the carbon containing compounds in the wastewater.

**County Sewer District** - An area or areas of land located within a county which has been designated and established for the purpose of: (a) the conveyance from other municipalities and districts within the county of sewage, and treatment and disposal thereof; (b) collection; or (c) both such conveyance and such collection.

**County Sewer Authority** - A public benefit corporation, created by an Act of the Legislature, authorized to, among other powers, borrow money and issue bonds or other obligations and to enter into contracts and to execute all instruments necessary or convenient or desirable for the purposes of the authority to carry out any powers expressly given it, including the power to purchase any sewage facility and any improvements, extensions and betterments situated wholly within the district; to construct, improve, maintain, develop, expand or rehabilitate sewage facilities; and to construct, improve or rehabilitate distribution and transmission facilities.

**Fecal Coliform** – Group of bacteria that inhibit the intestines of humans and animals. Presence in water or sludge is an indicator of pollution and possible contamination by pathogens.

**Flow** – The movement of a fluid from place to place

**mgd** – Million gallons per day

**mg/L** – Milligrams per liter, industry standard unit of measurement used for expressing the concentration of a given wastewater constituent.
`

1 mg/L = 1 part per million (ppm)
1 pound per gallon = 120,000 mg/L

**Nutrient Removal** – Removal of nitrogen, phosphorus, or both from the wastewater.

**NYSDEC** – New York State Department of Environmental Protection

**pH** – A measure of the acidity of a solution (7 is neutral)

**Primary Treatment** – Removal of a portion of the suspended solids and organic matter from the wastewater.

**SCADA** – Supervisory Control and Data Acquisition

**Secondary Treatment** – Removal of biodegradable organic matter (in solution or suspension) and suspended solids. Disinfection is also typically included in the definition of conventional secondary treatment.

**Settlable Solids** – Substance in wastewater that will not stay suspended in a sample, but settle to the bottom.

**SPDES** – State Pollutant Discharge Elimination System

**Total Kjeldahl Nitrogen (TKN)** – The combined amount of organic and ammonia nitrogen.

**Total Cyanide** – Concentration of cyanide in a solution

**Total Mercury** - Concentration of mercury in a solution

**Total Nitrogen** – Concentration of nitrogen in a solution

**Total Residual Chlorine** – Amount of chlorine remaining in the environment after natural or technological processes.

**Total Suspended Solids (TSS)** – The residue remaining after a filtered wastewater sample has been evaporated and dried at a specified temperature.

**USEPA** – United States Environmental Protection Agency

**WWTP** – Wastewater treatment plant