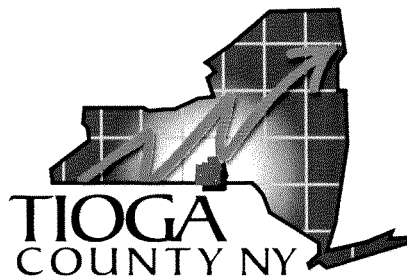


Infrastructure Master Plan 2004

Tioga County, New York



**CLOUGH, HARBOUR
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I. Executive Summary

The purpose of the Infrastructure Master Plan (IMP) is to provide strategies for implementing future improvements to Tioga County's water and sewer infrastructure. This plan will be used in coordination with the County's Future Land Use Plan as well as other existing municipal plans to manage growth and development based on infrastructure improvements. Through effective growth management, Tioga County's residents will experience an increase in the County's quality of life, realized most notably through the improvement of public health and safety. The IMP will also identify projects that will enhance the overall performance of the County's infrastructure in order to improve public health and safety and help to facilitate economic growth.

To accomplish the IMP's goals, the planning process was organized into the following phases:

1. Steering Committee Initiation
2. Review of Existing Information
3. Preparation of Base Mapping
4. Public Outreach
5. Data Analysis
6. Project Identification and Prioritization
7. Summary of Findings and Recommendations

It is the desire of the County Legislature to conduct the IMP as an open and inclusive public process to best meet the needs of the community. As a result of this initiative, a Task Force comprised of a Steering Committee was appointed to monitor the progress and content of the IMP. Members of the Steering Committee can be found in Appendix A, entitled *Key Personnel*.

Several existing plans were used as the basis for the IMP. These documents helped the County establish a blueprint for coordinated infrastructure growth by identifying a

number of economic, health, and safety concerns that are a result of limited public infrastructure. County officials have indicated an interest in updating these documents with the intent that the IMP will be incorporated into the appropriate revisions at a later date.

As part of the planning process, Clough, Harbour & Associates LLP (CHA) conducted a community-by-community review of the existing water and sewer facilities within the nine (9) towns and six (6) villages of Tioga County. The community review consisted of meetings with municipal officials to gather information relative to the existence, or lack of, public utilities. The focus of these meetings was to identify known or perceived health and safety issues that involve utility infrastructure. CHA also discussed economic development opportunities and future plans with the municipal officials.

A review of the community interview meeting minutes (see Appendix C, entitled *Interview Meeting Minutes*) has revealed a reoccurring need to improve health and safety, especially in the more densely populated areas of the County, by providing, upgrading, and/or expanding water and sewer systems. Moreover, the lack of sufficient infrastructure and/or the presence of older, outdated infrastructure have hindered economic development opportunities. Some of the municipalities expressed the need as well as their support for the consolidation of efforts among towns and villages.

CHA created maps that identified opportunities and constraints in order to identify water/sewer infrastructure priority areas to assist with the project prioritization procedure. Future land use and existing infrastructure maps were also referenced for these tasks. An infrastructure priority area map was created and later reviewed by representatives during the interview process to refine each community's priority area boundaries (see Figure 1, entitled *Infrastructure Priority Areas*).

CHA analyzed all of the data that were collected and produced. The results of this analysis are discussed in Chapter V, entitled *Analysis of Findings*.

CHA created a comparative utility rate study to analyze water/sewer rates in the County. These rates were compared to similar communities in Montgomery County, which indicated that Montgomery County residents pay on average 6% less to 1.5% more than a similar customer in Tioga County. The analysis included a review of the cost of alternative systems such as wells and raised-bed septic systems. The results concluded that the annual cost of alternative systems may be higher per household than annual costs for municipal systems.

The data analysis and community interviews exercise resulted in a list of potential infrastructure projects. These projects were prioritized using a ranking procedure by community representatives. The final ranked list of potential projects will guide decisions that impact future infrastructure and/or economic development projects in Tioga County. Various grants and other funding opportunities exist for the funding/financing of the identified water and wastewater projects in Tioga County.

The steering committee ranked the projects and the top fifteen highest priority projects have been considered for implementation. These projects generally begin with application for funding, followed by an engineering report, design and construction documents, and health department review and approval. Each project would be publicly bid (as required by law) and constructed by a reputable construction company.

II. Project Description

The Clough, Harbour & Associates LLP (CHA) project team (Appendix A, entitled *Key Personnel*) worked closely with Tioga County representatives and local officials to complete the Infrastructure Master Plan (IMP). The overall goal of this effort was to provide strategies that improve water and sewer facilities to effect positive change under two major categories:

1. Public Health and Safety
2. Economic Growth

Tioga County officials commissioned this plan in response to the concern over the absence of a well developed water and sewer infrastructure network throughout the region. Currently, Tioga County has about four percent (4%) of its area serviced by municipal water and sewer systems. This coverage includes a little more than one third (34.3%) of Tioga County's 18,800 households. An additional 1,000 households (5%) are served by municipal water and must rely on septic systems for sanitary sewage disposal. County officials also recognize numerous other challenges with respect to water and sewer infrastructure including, but not limited to: the risk of well contamination, the reliability of aging systems, and existing systems requiring upgrades. These conditions have the potential to impact the health and safety of County residents as well as hinder economic development.

The purpose of this plan is to provide strategies for implementing future improvements to Tioga County's water and sewer infrastructure. This plan will be used in coordination with the County's Future Land Use Plan as well as other existing municipal plans to manage growth and development based on infrastructure improvements. The IMP will help Tioga County increase its quality of life by identifying projects that will improve public health and safety. The IMP will also identify projects that will enhance the County's infrastructure and encourage economic growth.

To accomplish the goals of the IMP, the process was organized into the following phases:

1. Steering Committee Initiation
2. Review of Existing Information
3. Preparation of Base Mapping
4. Public Outreach
5. Data Analysis
6. Project Identification and Prioritization
7. Summary of Findings and Recommendations.

It is the desire of the County Legislature to conduct the IMP as an open and inclusive public process to best meet the community's needs. As a result of this initiative, a Steering Committee Task Force was appointed to monitor the progress and content of the infrastructure master plan. Members of the Steering Committee can be found in Appendix A, entitled *Key Personnel*.

The 1997 Tioga County Comprehensive Plan, the 1995 Economic Development Priorities and Policies document, and the 1998 Tioga County Future Land Use Plan were used as the basis for the IMP. These documents identified a number of economic, health, and safety concerns that are a result of limited public infrastructure. The review of these documents assisted the County with establishing a blueprint for coordinated infrastructure growth. County officials have indicated an interest in updating these documents with the intent that the IMP will be incorporated into the appropriate revisions at a later date.

Tioga County has a well developed Geographic Information System (GIS) that contains current information on the location of infrastructure throughout the County. Moreover, the Tioga County Planning Department has been successful at maintaining an updated GIS database as new infrastructure is developed. For the purposes of this study, the existing water and sewer system infrastructure was evaluated utilizing GIS to understand the extents of the existing water and sewer infrastructure. Under a

parallel process, an environmental constraints map was prepared based on existing GIS information such as the location of public roads, municipal boundaries, areas of steep slopes, floodplains, and economic development zone boundaries. The creation of the environmental constraints map, in concert with the existing utilities map was utilized to determine the current status of the County's infrastructure as well as to formulate recommendations on the likely development of future infrastructure.

Tioga County officials believe strongly in a collaborative planning process and, as a result, each of the villages and towns within Tioga County (as well as the Village of VanEtten and Broome County) were engaged in the process. Data that includes known health and safety concerns, opportunities for economic growth, and the strengths and weaknesses of existing infrastructure were collected and discussed. The public outreach process reached community leaders, utility operators, and concerned citizens during a period that lasted approximately three weeks. This effort provided the raw data that served as the basis for the remainder of the planning tasks. After the lengthy data collection process, data analyses were conducted combining GIS information and the local knowledge provided by the community involvement process. The data analysis focused on environmental constraints and opportunities with the goal of enhancing the quality of life in Tioga County.

Improvement of public health and safety while maximizing opportunities for economic development is the main goal of this plan. Therefore, recommendations that resulted from the IMP's analysis phase fall into one of two main categories:

1. Infrastructure Improvement / Upgrade Projects
2. Utility Provider "Best Practices"

Proposed infrastructure projects were developed following the community interviews and the detailed discussions with utility providers. Each proposed project is ranked based on criteria and is described in Appendix D, entitled *Project Ranking Materials*. A conceptual cost estimate and financial feasibility study was generated for each of the listed projects.

III. Goals and Objectives

This Infrastructure Master Plan is intended to organize a county-wide approach to improve the quality of life for Tioga County residents by managing infrastructure improvements and economic development. The IMP is intended to achieve the following interrelated goals for the County.

Goal 1: Describe an infrastructure improvement program that will protect the health and safety of Tioga County residents by creating infrastructure or improving the overall performance of existing infrastructure.

Objective: To create new sewer and water infrastructure to reduce the potential of contamination from wastewater and individual septic systems.

Objective: To upgrade and/or replace aging or failing sewer and water infrastructure.

Objective: To upgrade or expand water service for fire protection.

Objective: To provide security systems at public water supply locations.

Goal 2: Describe an infrastructure improvement program that promotes infrastructure investments to support economic development and encourage private investment in Tioga County, consistent with current County and municipal plans.

Objective: To create development potential by extending sewer and water infrastructure to developable locations.

Objective: To facilitate economic development by providing a safe, reliable and cost efficient sewer and water infrastructure.

Objective: To identify priority areas of the County that may provide economic development opportunities by identifying areas of need regarding sewer and water infrastructure.

Goal 3: Develop implementation strategies that will improve cost effectiveness and efficiency through the implementation of best practice initiatives within the various County service providers.

Objective: To institute more efficient procedures for metering and billing sewer and water usage.

Objective: To determine sewer and water infrastructure projects that are most feasible from a cost perspective.

Objective: To determine sewer and water infrastructure projects that are most feasible from an environmental perspective.

Objective: To provide ongoing maintenance of sewer and water operations systems.

Objective: To share resources (staff & equipment) among municipalities.

Objective: To analyze rate structures for town/village water and sewer infrastructure and compare to similar communities in other counties.

IV. Methodologies

A. Preliminary Project Identification

The Tioga County Infrastructure Master Plan process began by identifying projects that have the potential to receive funding from the United States Department of Agriculture (USDA). The Tioga County Rural Economic Area Partnership LDC (REAP) and the County's represented communities may be eligible for infrastructure improvement funding from the USDA program. Clough, Harbour & Associates LLP coordinated with Tioga County representatives to generate a preliminary list of 21 water and/or sewer infrastructure projects within the County. These projects were put in a matrix and rated on a scale of one to ten (1-10), with ten (10) being the most desirable. There were six (6) rating criteria for each project making a total possible score of 60. The final matrix, which posted the average ratings for each project, was completed by 14 municipal officials on the strategic committee that represented various municipalities within the County. The preliminary projects rating matrix can be found in Appendix D, entitled *Project Ranking Materials*.

Six criteria were used for the rating process which included project cost, health and safety, economics, municipal administration, environmental constraints, and schedule feasibility. A summary of the six criteria was provided to the 14 strategic committee representatives to assist with the proper rating of each category. The projects and criteria generated in this task were subject to change during community representative and utility provider interviews. The final matrix, which appears in Appendix D, prioritized the preliminary projects by ranking each by highest total score.

B. Opportunities and Constraints Mapping

Geographic Information Systems (GIS) played an important role in creating maps that illustrated opportunities and constraints for Tioga County. Opportunities and

constraints maps were created by utilizing data files provided by the Tioga County Department of Economic Development and Planning. These maps helped to identify potential areas of future development that require the creation or expansion of infrastructure. These areas are referred to as water and sewer infrastructure priority areas.

A constraints map was prepared to illustrate areas within the County that may be deemed unsuitable for development. Areas that are unsuitable or less likely to be developed are floodplains, wetlands, agricultural districts, steep slopes, archeologically important areas, public lands, and critical environmental areas. Some of these constraints were not presented on the final map due to their unavailability as GIS files.

After identifying areas that may be deemed inappropriate for development, an opportunities map was prepared in order to highlight the best possible areas for development. Criteria that were used to identify areas suitable for future development including Empire Zone properties, areas with existing water and/or sewer infrastructure, highway accessible areas, and areas unencumbered by environmental constraints.

C. Community Interviews

Representatives from the planning area's nine (9) towns and six (6) villages helped to identify infrastructure issues and opportunities. A CHA representative met with municipal officials to discuss known or perceived issues, needs, and concerns regarding infrastructure and economic development. Meeting minutes were taken during these sessions. In addition, summaries of the interviews with the municipal officials are provided in Appendix C, entitled *Interview Meeting Minutes*.

The purpose of these interviews was to acquire local knowledge of known infrastructure issues, needs, and, most importantly, health and safety issues that may

be present in respective communities, and further input on the Infrastructure Priority Areas Map. CHA also conducted meetings with United Water in Nichols and Owego to investigate infrastructure needs and to identify issues.

D. Comparative Utility Rate Study

CHA contacted appropriate water and sewer service representatives to acquire rate information for such services throughout the County. The rate information was compared to rate studies prepared by the NYS Association of Towns. CHA compared water and sewer rates to the rates found in other towns and villages of similar population within New York State. The Rate Study provides a benchmark to indicate how high or low the rates are for Tioga County municipalities in comparison to other areas of the state. The results of the Comparative Utility Rate Study are provided in Chapter V Section C.

E. Cost Estimation / Financial Feasibility

CHA reviewed the maps and data, prepared a financial feasibility study, and determined preliminary cost estimates for developing water and sewer infrastructure in each of the recommended locations. To estimate infrastructure cost, CHA considered the number of potential users and factored that number against the conceptual cost of improvement. Census data from the 2000 U.S. Census Bureau were utilized to obtain demographic information for each municipality. In addition, CHA also analyzed digital aerial orthophotos taken by New York State in 2002.

F. Utility Provider Coordination

The task of coordinating efforts with utility providers involved three (3) planning meetings with municipal utility organizations. The purpose of these meetings was to discuss the potential for inter-municipal agreements, which included the sharing of staff, equipment and/or resources within Tioga County.

G. Planning and Coordination Meetings

Six coordination meetings were held throughout the course of the planning process. In addition, numerous telephone conversations were required to accomplish many of the tasks mentioned in this section to keep the study moving forward.

H. Grants/Funding Opportunities

CHA investigated available funding sources (see Chapter V Section D, entitled *Grants/Funding Opportunities*) to implement the IMP and advised Tioga County as to the available funding that can be obtained to implement the various infrastructure improvements that are recommended in Chapter VI.

I. Finalized Project Identification and Priority Areas Map

A preliminary list of 21 potential projects was identified to meet the USDA funding deadline. The proposed projects were verified, deleted, altered, and added during the interview process with town, village, and utility provider representatives. A final list of 43 potential infrastructure and economic development projects were compiled after all comments were considered. These projects were then rated and ranked based on specific criteria that were developed during the ranking exercise. The final prioritized list will be used as a guide for future infrastructure and economic development projects.

The format used for the rating and ranking process and all of the materials given to the participating representatives are provided in Appendix D, entitled *Project Ranking Materials*. This process was completed using a matrix that was developed to rank the projects based on ratings given to each of the criteria. The five criteria were rated on a scale of one to three (1 to 3), three being the highest score. Each of the criteria were then given a weight, meaning that if a criteria was given more weight

then it would become more influential in the ranking procedure. The five criteria were given a weight of one to five (1-5), each number was only used once. The numbers generated for each project's criteria were totaled and divided by the number of criteria that were actually rated; criteria given NA (Not Applicable) were not counted. The projects were then ranked according to their weighted average score.

Land Use and Environmental Constraints were rated prior to the ranking exercise based upon mapping produced from Geographic Information System (GIS). The Tioga County Land Use Plan and the infrastructure priority map were utilized in ranking the land use criteria. CHA then used environmental constraints mapping to rate the Environmental Constraints criteria. These criteria were rated on a scale of 1-3, as shown below.

Land Use & Economic Development

- 3** = Highly compatible with future land use and high potential for economic development
- 2** = Compatible with future land use and possible potential for economic development
- 1** = Not compatible with future land use and no potential for economic development

Environmental Constraints

- 3** = Few or no constraints (Most Compatible)
- 2** = Somewhat constrained (Somewhat Compatible)
- 1** = Highly constrained (Least Compatible)

The infrastructure priority areas map, located in Chapter V, identifies key areas best suitable for infrastructure improvements and economic development opportunities. This map, which was derived from the opportunity (Appendix B), constraints (Appendix B), future land use (Figure 2), and infrastructure maps (Figures 3&4), was revised during the community interview process. CHA created a final infrastructure

priority area map based on the received comments. This map, along with the list of ranked top priority infrastructure projects in Tioga County, will provide guidance regarding future infrastructure development within the County.

V. Analysis of Findings

A. Opportunities, Constraints & Infrastructure Priority Areas Mapping

Constraints Map

The purpose of the constraints map is to identify those areas that are least likely to experiment significant development. The constraints that were mapped for this study include agricultural districts, floodplains, wetlands, public lands, and steep slopes. There are other types of constraints that can be taken into consideration for this type of mapping; however, additional constraints mapping was limited due to a lack of electronic data. Other constraints such as critical environmental areas, environmentally sensitive areas, and archeologically sensitive areas were considered, but are not illustrated on the maps.

A visual analysis of the constraints maps indicated that much of Tioga County is constrained by natural features as shown in Appendix B, entitled *Opportunity and Constraint Mapping*. There are numerous areas of steep slopes (20% or greater) which are unsuitable for development. Agricultural districts are set aside for the sole purpose of remaining in agriculture use. These districts occupy a large amount of land throughout the County and should not be considered for development. Wetland and floodplain areas are also not suitable for development. Public lands, including state reforestation areas, county forests, and municipal parks, cannot be used for development; these lands are for public use only. Rural areas that do not have adequate road infrastructure or direct access to a major route are also considered constrained areas. Areas that do not have constraints are considered areas of opportunity. Conversely, not all of these lands are best suited for development.

Opportunities Map

A constraints map serves as the base map for the opportunities map. Opportunities are then overlaid onto the constraints map to create a final map (as shown in Appendix B). Opportunities utilized for site selection include proximity to existing water and

sanitary services, proximity to major transportation routes, Empire Zone properties, and areas free of natural/environmental constraints. Recommendations for infrastructure improvements and economic development areas were based on local knowledge about health and safety considerations. This analysis can be viewed in Appendix D entitled *Project Ranking Materials*.

Infrastructure Priority Areas Map

CHA analyzed the maps and took all of the criteria into consideration to create a final infrastructure priority area map that highlights general areas to be considered for water and/or sewer infrastructure upgrades or installation (Figure 1). These areas are also considered to be the areas that are most suitable for economic development. Review of the Tioga County Future Land Use Map (Figure 2), Existing Water System Inventory (Figure 3), and Existing Sewer System Inventory (Figure 4) was a key part of this process.

Water and sewer infrastructure priority areas on the map represent potential economic development areas that currently lack water or sewer infrastructure. Water and sewer infrastructure priority areas are found on the outskirts of villages and along major routes. Water upgrade or new sewer priority areas are areas that are in need of water infrastructure upgrade or the creation of sanitary infrastructure. These areas include the villages of Newark Valley, Nichols, and Candor. Water and/or sewer upgrade priority areas are areas that may have water or sewer infrastructure, but are in need of repairs or upgrades. Water and/or sewer upgrade priority areas are found in the villages of Waverly and Owego, and in the Town of Owego.

The conclusion from analyzing the opportunities, constraints and infrastructure priority areas maps is that areas most suitable for development are found adjacent to major transportation routes and villages. Rural areas are not as practical for development due to the high cost of creating and/or extending infrastructure in these areas.

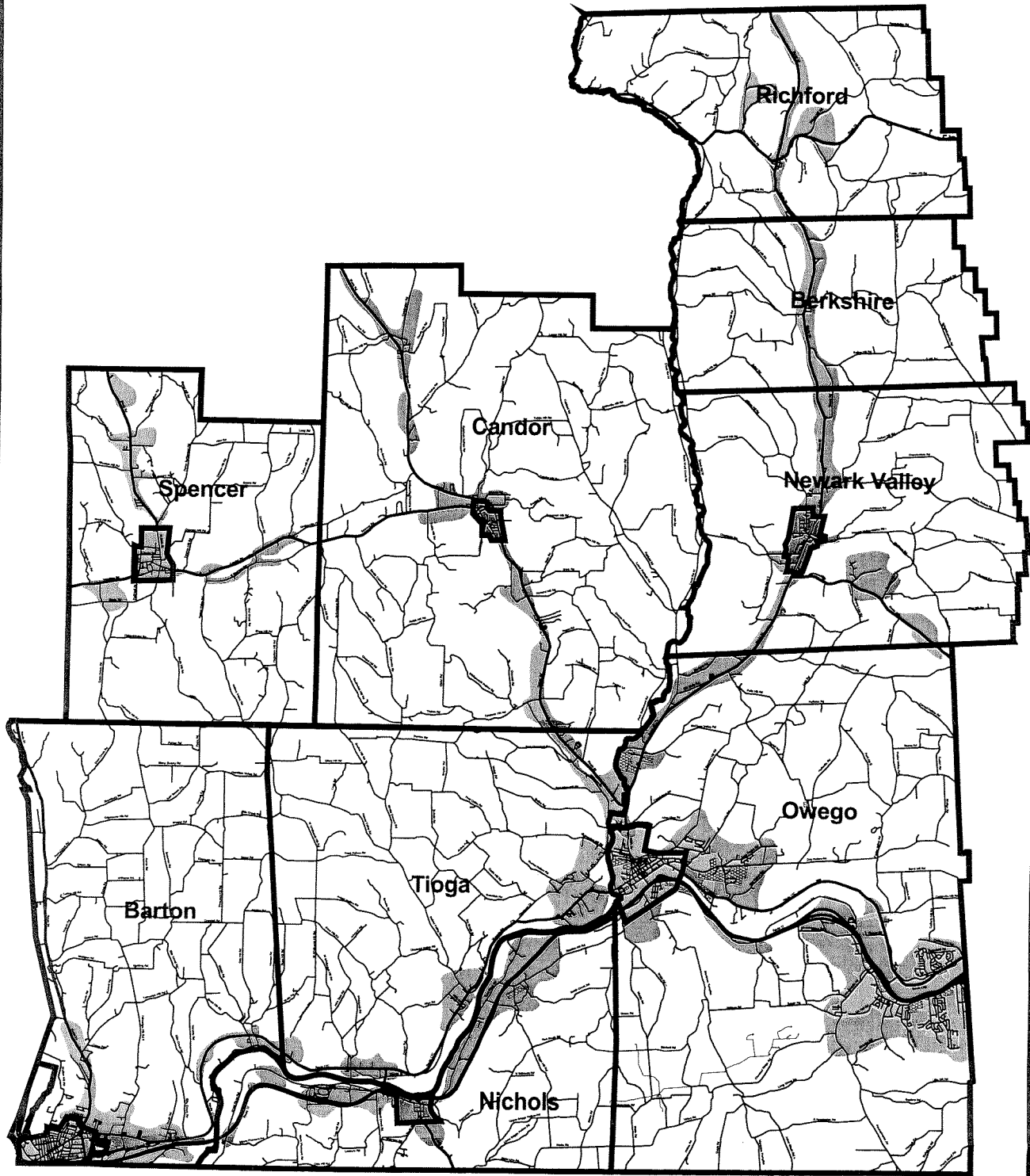


Figure 1



Infrastructure Priority Areas

Tioga County

* Based on community interviews and environmental constraints

Source: Tioga County Planning, 2003
 Disclaimer: This map is intended for planning purposes only. No warranties are expressed or implied. (Created July, 2003)



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- Municipal Boundary
- Routes
- Roads
- Empire Zone Properties
- Infrastructure Improvements
- Water and Sewer Infrastructure Priority Areas
- Water Upgrades or New Sewer Priority Areas
- Water and/or Sewer Upgrade Priority Areas

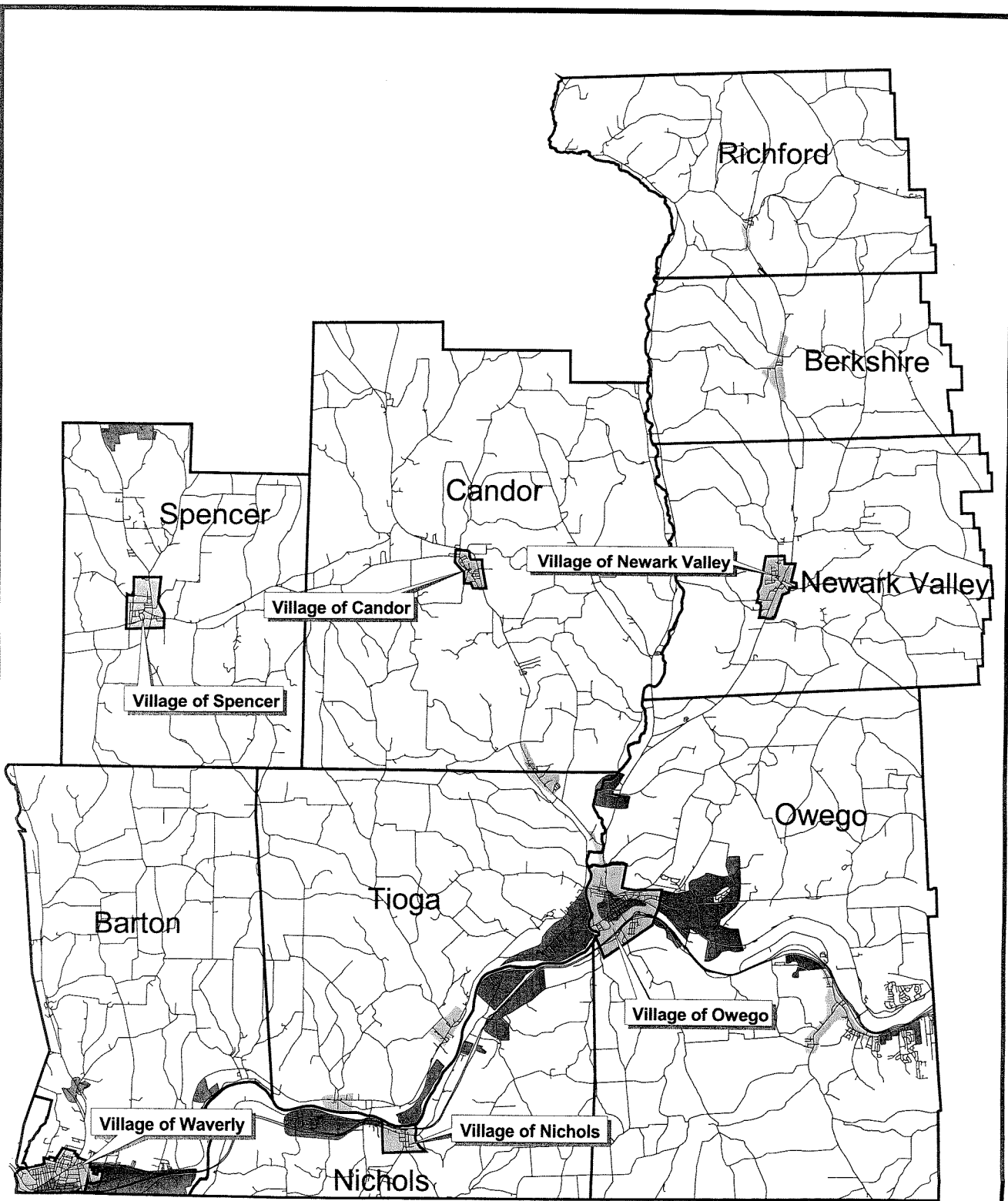
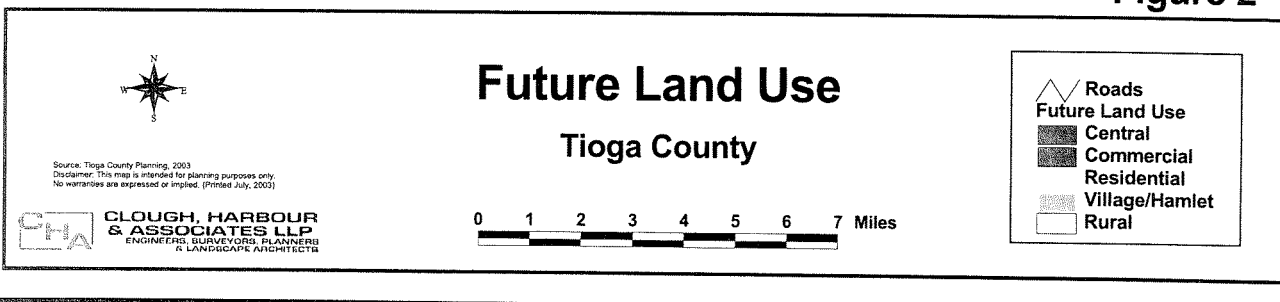


Figure 2



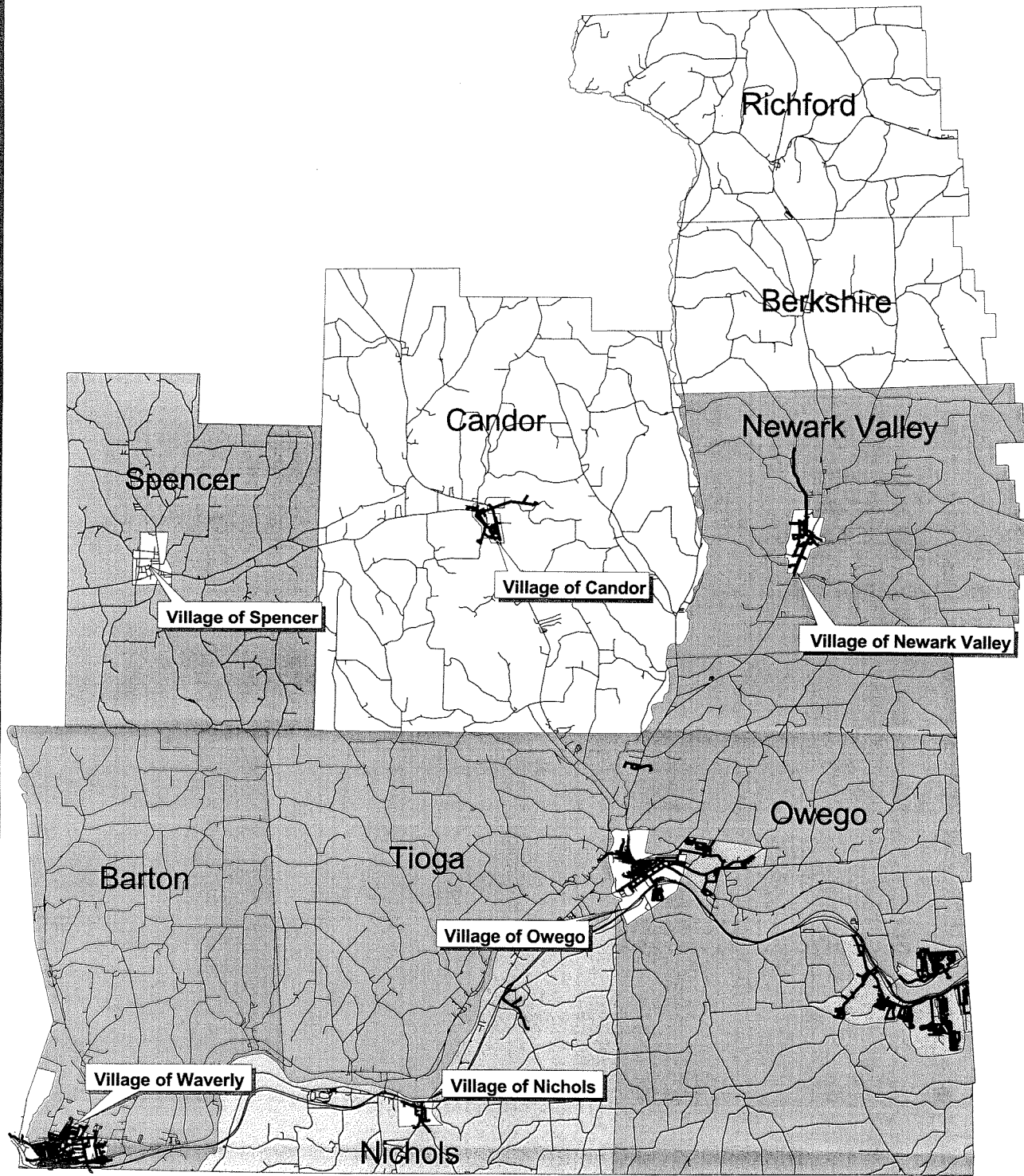


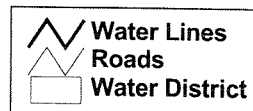
Figure 3

Existing Water System Inventory

Tioga County



Source: Tioga County Planning, 2003.
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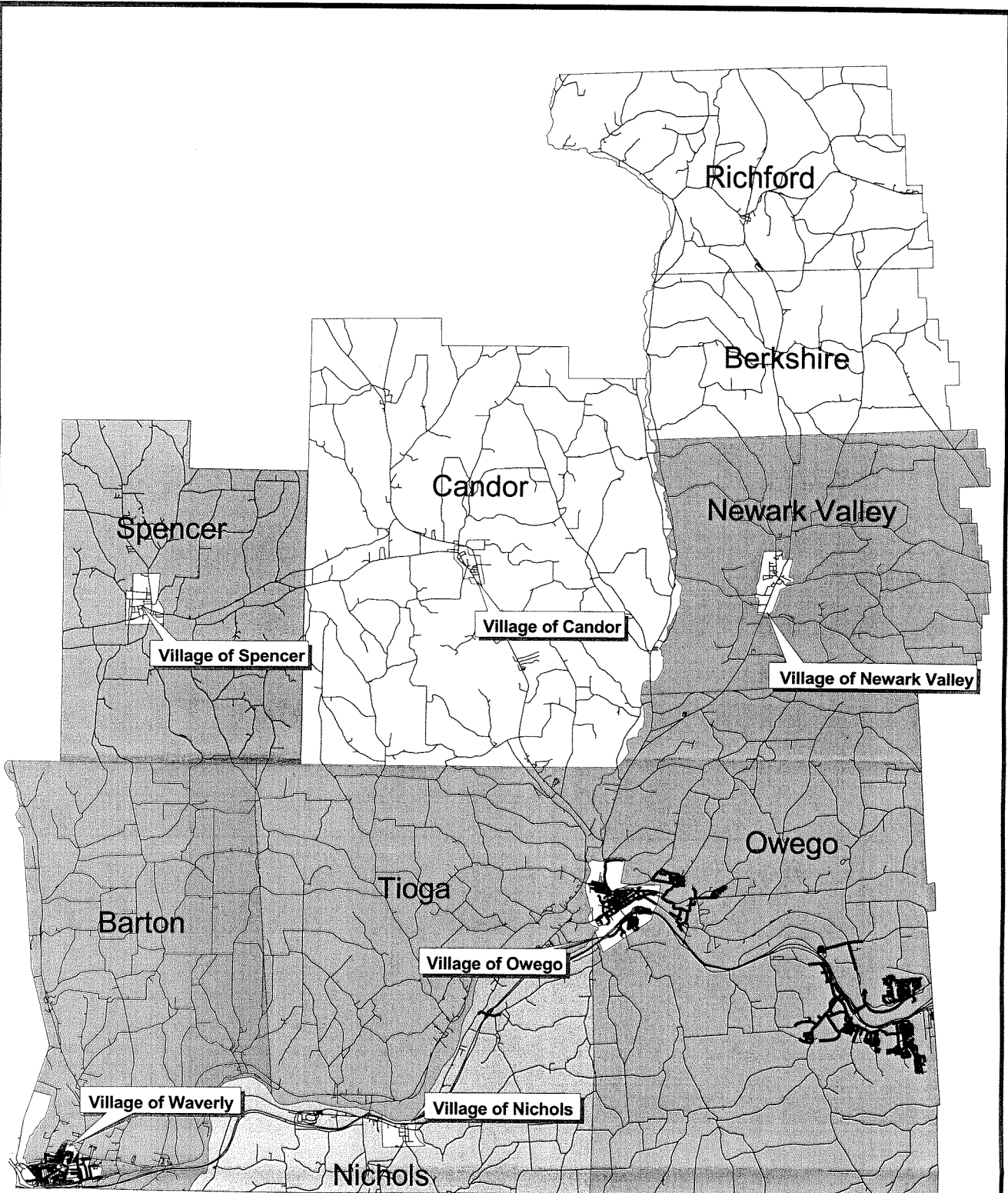


Figure 4

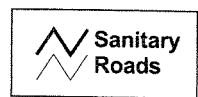
Existing Sanitary Sewer Inventory

Tioga County



Source: Tioga County Planning, 2003
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B. Community Interviews

The community interviews are provided in full and are summarized in Appendix C, entitled *Interview Meeting Minutes*. The community interviews provided local knowledge of issues, opportunities and needs within each of the communities. The following sections summarize the identified needs and major concerns of each community.

VILLAGE OF OWEGO

The Village of Owego's highest priority is the need to replace the trunk sewer on Front Street, which currently violates their SPDES discharge permit during wet conditions. In addition, the Village has indicated that approximately four private residential wells have tested positive for E. Coli bacteria. The following list represents the community's needs categorized into the topics of Economic Development, Maintenance/Replacement, and Other.

Economic Development

- Extend water and sewer infrastructure to the east of Johnson Pools
- Possible abandonment of septic system and installation of a holding tank at fairgrounds

Maintenance/Replacement

- Trunk sewer replacement on Front Street from Paige to Williams Street
- New mechanical bar screen at treatment plant
- Possible force main upgrade at Owego Middle School

Other

- Increase sewer pipe diameter between Dean Street and Thrift Store
- Creation of countywide compost facility
- Village would like to enter an inter-municipal agreement with the Town of Tioga for sewer main extensions along Glenmary Drive, Route 17C and Route

TOWN OF OWEGO

The Town of Owego's highest priorities include the development of the Route 434 corridor from the Broome County Line to Forrest Hill Road. The following list represents the community's needs categorized into the topics of Health & Safety, Economic Development, Maintenance/Replacement, and Other.

Health & Safety

- New reservoir on Forest Hill

Economic Development

- Development of Route 434 corridor from Broome County line to Forest Hill Road, including sewer extension from Hilton to Forest Road and between Johnson's Pools and the Village line
- Extend sewer up E. Campville to Caferty Hill through Campville Commons
- Utility extensions on Day Hollow Road near Visions Credit Union to Bodle Hill Road
- Additional flows to Route 38 industrial park (water and sewer force main)

Maintenance/Replacement

- Reservoir repairs and addition of emergency generators
- Construction of Digester Covers at the Apalachin Plant
- Reservoir upgrades and replacements and emergency power
- Water main replacement from Depot Street to Forest Hill

Other

- Countywide compost facility

TOWNS OF BERKSHIRE/RICHFORD

The water wells and septic systems do not have adequate separation and the potential for cross contamination is great within both towns. Both towns expressed that they are willing to work together to create an inter-municipal agreement for shared utility systems, with water being their priority for infrastructure improvements. The following list represents the communities' needs categorized into the topics of Health & Safety, and Economic Development.

Health and Safety

- Municipal infrastructure – water being the priority
- Inter-municipal agreement for shared utility systems
- Provide fire protection to Berkshire Furniture
- Repair failing septic systems

Economic Development

- Residential development

TOWN/VILLAGE OF CANDOR

The highest priority for the Town and Village of Candor is upgrading and expanding its current water system. Village representatives expressed the need of new wells and water tanks in order to support economic development. There is no need for public sewers at this time. The following list represents the communities' needs categorized into the topics of Health & Safety, Economic Development, Maintenance/Replacement, and Other.

Health and Safety

- Upgrade and expansion of water system; sewer is less important at this time

Economic Development

- Upgrade and expansion of water system, sewer is less important at this time
- New wells and tanks to support economic development

Maintenance/Replacement

- Modernize water meters and billing system
- Upgrade Owego Street from 2 inch PVC to 6 inch PVC for approximately 200 feet
- Replace existing 4 inch main – approximately 5,300 feet throughout Village

Other

- Water main loop on Royal Street

VILLAGE OF WAVERLY & TOWN OF BARTON

The highest concern for the Town of Barton and the Village of Waverly is the lack of water storage capacity and the disposal of sludge. Other improvements that the Town and Village would like to see include relining to repair leaking, replacement of approximately 4,000 feet of a four (4) inch diameter water main on Fulton Street and approximately 1,500 feet of a three (3) inch diameter main near Lyman Avenue, various water and sewer line extensions, disposal of sludge, and reconfiguration of the dam spillway. The sewer plant appears to have enough capacity to support significant economic development; however, the existing infrastructure network needs a few improvements as mentioned above. The following list represents the communities' needs categorized into the topics of Health & Safety, Economic Development, Maintenance/Replacement, and Other.

Health and Safety

- Reconfiguration of dam spillway to reduce turbidity
- Additional well with booster station

Economic Development

- Increase water storage capacity – Addition of two (2) million gallon reservoir
- New water line past the sewage treatment plant to the Hagen pet food plant – Approximately 8,000 feet of eight (8) inch main is required
- Additional sewer line to Leprino
- Additional well with booster station
- Extend water and sewer from the Elba Trailer Park farther east along Route 17C down to Ellis Creek that would expand service to Gail Ann Estates, Maple Lane and Sunset Trailer Parks, and Baggerly Subdivision

Maintenance/Replacement

- Replace three (3) inch main with 8 inch main throughout the Village – Approximately 1,500 feet
- Replace 4,000 feet of four (4) inch water main on Fulton Street
- New water main crossing by Broad Street extension bridge (Cayuta Creek)
- Sewer relining to fix leaking

Other

- Long term, low cost solution to sludge disposal
- County wide compost facility
- Upgrade pumps in chlorine contact tanks to support sewage treatment plant upgrade to 1.3 mgd

TOWN OF TIOGA

The highest priority issues for the Town of Tioga are concerns relating to health and safety. Existing septic systems have the potential to contaminate groundwater resources. The Town would like to investigate the feasibility of developing a municipal sewer system based on the existing infrastructure at the Tioga Center School sewage treatment plant. Town representatives expressed that economic development opportunities were lost in part due to the lack of water, sewer and bridge infrastructure. The following list represents the community's needs categorized into the topics of Health & Safety and Economic Development.

Health & Safety

- Develop a municipal sewer system for Tioga Center, based on existing sewage treatment plant at the Tioga Central School Complex

Economic Development

- Water and sewer upgrades on Glenmary Drive and Route 96
- Bridge to Lounsberry (river crossing)

TOWN/VILLAGE OF SPENCER

The top priority for the Town and Village of Spencer is to create a municipal water system as previous water tests have shown positive for nitrates. Town and Village representatives indicated an interest in forming an inter-municipal agreement with VanEtten to extend serves into Spencer. This would allow for economic and residential development opportunities for both communities. The following list represents the communities' needs categorized into the topics of Health & Safety and Economic Development.

Health and Safety

- Municipal water and sewer systems – water is highest priority
- Municipal agreement with VanEtten to extend water into Spencer

Economic Development

- Municipal water and sewer systems – water is highest priority
- Municipal agreement with VanEtten to extend water into Spencer
- Utilize reserves of undeveloped land for development
- Public water for businesses especially food service establishments

TOWN/VILLAGE OF NEWARK VALLEY

The Town and Village of Newark Valley's highest priority issues include water line extensions to the fire department and to the high school. Other issues include coliform contamination in the valley area, old fire hydrants, leaking sewers, the need for a new reservoir, a lack of security measures for water supply, and need to replace up to 75% of existing water lines. The following list represents the communities' needs categorized into the topics of Health & Safety, Economic Development, Maintenance/Replacement, and Other.

Health and Safety

- Water line extension to fire department and high school

Economic Development

- Water line extension to fire department and high school
- Extend sewer to ladder factory
- Public sewers to increase water quality and recreational use of Owego River

Maintenance/Replacement

- Replace four (4) inch mains
- Replace 67 old fire hydrants
- Replace water line that exits the village to the north – has numerous leaks

- New reservoir to replace existing, new access road to the tank and a new reservoir on the west side of the creek
- Replace up to 75% of old and vulnerable waterline

Other

- Provide fencing around wells and pump house for security

TOWN/VILLAGE OF NICHOLS

The largest threat for the Town and Village of Nichols is the risk of groundwater contamination due to several existing and formerly existing businesses as well as possible petroleum contamination. Village officials have indicated that they do not want to operate water and sewer systems, but they do support a county wide utility authority. The following list represents the communities' needs categorized into the topics of Health & Safety, Economic Development, and Other.

Health and Safety

- Stop or contain possible threats of contamination to the remaining municipal well and find a new well location for a new well
- Create/update water and sewer systems for future revitalization of industry, professional buildings, recreational facilities, and increase property values

Economic Development

- Create/update water and sewer systems for future revitalization of industry, professional buildings, recreational facilities, and increase property values

Other

- Creation of Village Comprehensive Plan

UNITED WATER OWEGO

United Water Owego supports the installation of a new Susquehanna River crossing and is also interested in extending services along Glenmary Drive to enhance economic development opportunities.

Economic Development

- Installation of a new river crossing and/or upgrading of existing eight (8) inch crossing
- Utilize excess capacity near Lockheed Martin and Sanmina to influence economic development
- Extension of services along Glenmary Drive – Replace small diameter pipe to the Glenmary Inn
- Service Canawanna area of the village with water and sewer
- Water line extension northward along the west side of Route 96 to service the Franzen Apartment Complex
- Extend water into neighboring communities via a wholesale agreement

UNITED WATER NICHOLS

United Water representatives noted that the highest priority for the Village of Nichols is to protect a single well that is located in an area that is known to contain contamination. Nichols has two wells. Well No. 1 located on Johnson Street is contaminated and Well No. 2 on River Street is threatened by the potential presence of gasoline and dry cleaning chemicals. The following list represents the needs categorized into the topics of Health & Safety, Economic Development, and Other.

Health and Safety

- Connect water line from Lounsberry to the Village of Nichols
- Stop or contain possible threats of contamination to wells

Economic Development

- Water line extensions as business venture
- Possible Tioga Park expansion

The reoccurring need for the majority of the towns/villages in Tioga County is to improve health and safety by providing and/or upgrading water and sewer systems, especially in more densely populated areas. Economic and residential developments are also being hindered by the lack and age of existing infrastructure. There is some

support for consolidation of efforts with adjacent towns/villages to reduce cost and maintenance.

C. Comparative Utility Rate Study

Overview

An important aspect in developing a water and wastewater system is to estimate revenues that will be collected to offset capital expenditures and operating expenses. In order to begin a preliminary assessment of potential revenues, CHA collected information from each municipal water and wastewater utility system in the Tioga County planning area. The rates in Tioga County typically include a fixed customer or minimum charge for each billing cycle and a volumetric charge based on the customer's actual water consumption. The rate structures used by these systems are similar to rates used by other water and wastewater systems in the State of New York and throughout the country. Table 1 shows a summary of the charges for each system. In addition to the monthly charges, CHA also collected information pertaining to connection charges or hookup fees.

CHA analyzed the rates charged by systems in Montgomery County, Schuyler County and the Town of Union. These systems were chosen because of the similar topography, population density, and proximity to Tioga County. The final aspect in this analysis involves comparing the cost of providing water and wastewater service through a centralized utility versus individual customers providing these services for themselves through wells and septic systems.

Water Rates

Seven systems within the Tioga County planning area provide water service. The systems have different structures in the rate tariff, which causes the quarterly charge to vary widely based upon the usage of the customer and the system from which the water is purchased. Table 2 shows the quarterly charge for water service by the level of consumption within that quarter. A typical residential household will use between

Table 1: Summary of Sewer and Water Rates in Tioga County

Water Rates

Line #	Village of Candor	Village of Newark Valley	Village of Waverly	Town of Barton*
1	Quarterly \$24.15	Semiannual \$54	Quarterly \$19.50	Quarterly \$19.50
2	Customer Charge 500-4,999 cf at \$0.02332	\$26/1,000 cf on all	801-5,000 cf at \$1.62/cf	801-5,000 cf at \$1.62/cf
3	Volumetric Charges	usage >1,000 cf	Over 5,000 cf at \$1.08/cf	Over 5,000 cf at \$1.08/cf
4				
5				
6				
7	Connection Fee \$0	\$20	\$0	\$0

Line #	Village of Nichols	Village of Owego	Town of Owego
1	Quarterly	Quarterly	Once Every 4 Months
2	Customer Charge \$57.00 Minimum	\$0	\$12
3	Volumetric Charges	First 2,800 cf at \$2.927681/ccf	\$2.72 per 1,000 gallons
4		Next 7,733 cf at \$2.25/ccf	
5		Next 16,134 cf at \$1.463/ccf	
6		Over 26,668 cf at \$1.31/ccf	
7	Connection Fee \$0	\$0	\$50

Sewer Rates

Line #	Village of Waverly	Village of Owego	Town of Owego	Town of Barton*
1	Quarterly	Quarterly	Once Every 4 Months	Quarterly
2	Customer Charge \$5.75	\$45 Minimum	\$12	\$5.75
3	Volumetric Charges \$1.45 per 100 cf	\$3.70 per 100 cf	\$3.10 per 1000 gallons	\$1.45 per 100 cf
4	Connection Fee \$0	\$300	\$50	\$0

* Proposed rates for Year 2005.

Table 2: Sampling of Rate Comparisons for Water Service for Tioga County

Line No.	Usage per Quarter (CF's)	Usage per Quarter (Gallons)	Village of Candor	Village of Newark Valley	Village of Waverly	Town of Barton	Village of Nichols	Village of Owego	Town of Owego	Average of Systems in Planning Area
	A	B	C	D	E	F	G	H	I	J
1	-	-	\$ 24.15	\$ 27.00	\$ 19.50	\$ 19.50	\$ 57.00	\$ -	\$ 9.00	\$ 22.31
2	250	1,870	\$ 24.15	\$ 27.00	\$ 19.50	\$ 19.50	\$ 57.00	\$ 7.32	\$ 14.09	\$ 24.08
3	500	3,740	\$ 24.15	\$ 27.00	\$ 19.50	\$ 19.50	\$ 57.00	\$ 14.64	\$ 19.17	\$ 25.85
4	750	5,610	\$ 29.98	\$ 27.00	\$ 19.50	\$ 19.50	\$ 57.00	\$ 21.96	\$ 24.26	\$ 28.46
5	1,000	7,480	\$ 35.81	\$ 27.00	\$ 22.74	\$ 22.74	\$ 57.00	\$ 29.28	\$ 29.35	\$ 31.99
6	1,250	9,350	\$ 41.64	\$ 33.50	\$ 26.79	\$ 26.79	\$ 60.13	\$ 36.60	\$ 34.43	\$ 37.12
7	1,500	11,220	\$ 47.47	\$ 40.00	\$ 30.84	\$ 30.84	\$ 72.15	\$ 43.91	\$ 39.52	\$ 43.53
8	2,000	14,960	\$ 59.13	\$ 53.00	\$ 38.94	\$ 38.94	\$ 96.20	\$ 58.55	\$ 49.69	\$ 56.35
9	2,500	18,700	\$ 70.79	\$ 66.00	\$ 47.04	\$ 47.04	\$ 120.25	\$ 73.19	\$ 59.86	\$ 69.17
10	3,000	22,440	\$ 82.45	\$ 79.00	\$ 55.14	\$ 55.14	\$ 144.30	\$ 86.47	\$ 70.04	\$ 81.79
11	3,500	26,180	\$ 94.11	\$ 92.00	\$ 63.24	\$ 63.24	\$ 168.35	\$ 97.72	\$ 80.21	\$ 94.12
12	4,000	29,920	\$ 105.77	\$ 105.00	\$ 71.34	\$ 71.34	\$ 192.40	\$ 108.97	\$ 90.38	\$ 106.46
13	4,500	33,660	\$ 117.43	\$ 118.00	\$ 79.44	\$ 79.44	\$ 216.45	\$ 120.22	\$ 100.56	\$ 118.79
14	5,000	37,400	\$ 129.09	\$ 131.00	\$ 87.54	\$ 87.54	\$ 240.50	\$ 131.47	\$ 110.73	\$ 131.12
15	10,000	74,800	\$ 203.04	\$ 261.00	\$ 141.54	\$ 141.54	\$ 346.15	\$ 243.97	\$ 212.46	\$ 221.39
16	15,000	112,200	\$ 276.99	\$ 391.00	\$ 195.54	\$ 195.54	\$ 421.65	\$ 321.32	\$ 314.18	\$ 302.32
17	30,000	224,400	\$ 498.84	\$ 781.00	\$ 357.54	\$ 357.54	\$ 648.15	\$ 535.67	\$ 619.37	\$ 542.59

60 and 80 thousand gallons each year. For our comparisons we have used approximately 15,000 gallons per quarter in order to be conservative in estimating revenues. Line 8 on Table 2 shows the total quarterly charge from each system for a residential household using an average volume of water. This average is \$56.35 for all of the systems, or an average of \$225.40 per customer annually. The quarterly charges range from a low of \$38.94 to a high of \$96.20. The table provides consumption in both cubic feet and gallons for ease of comparison. All but one of the systems in the survey (the Town of Owego) charges consumption based upon cubic feet.

A water system should consider two components in the rate design. The first cost component includes customer costs which are incurred to make service available to each customer. They include, but are not limited to, the capital costs of providing a tap to each service location, installing a meter, reading the meter, recording the usage, bill creation and mailing, accounting services for payment, and customer service functions. These costs are incurred by the water system each billing cycle for each customer regardless of the consumption during the period.

The second category of costs varies with consumption and the timing of the consumption. Included in this category would be chemicals, electricity to pump the water, on-going operations and maintenance for transmission and distribution mains, capital costs for storage tanks and other costs that increase as overall consumption increases, whether it is for an individual customer, a group of customers, or the entire utility.

A water utility must take into consideration both cost categories in designing rates, which is reflected in the rates shown in the survey. For example, if a water utility is built and customers are connected, those customers may or may not use water. The rate and connection fees should recover some or all of these costs without depending on consumption by individual customers to provide revenues.

The utility will also have incremental costs incurred as consumption increases and these costs should be recovered from customers with higher usage. This is done through a unit charge.

All of the systems in the survey except the Village of Owego have a fixed monthly or quarterly charge component in some form. These charges can be called a customer charge, a minimum monthly charge or some combination of the two. The two most notable examples are the Villages of Newark Valley and Nichols. Both systems have relatively high minimum charges, as shown in Table 2, and therefore the quarterly bill is the same for every customer until the minimum threshold is broken through at approximately 7,500 gallons per quarter. This, in effect, means that all customers on these systems will pay exactly the same amount each quarter unless they use more than the 7,500 gallons. This structure ensures that the two systems will recover a fixed amount of cost from each customer, even if those customers use little or no water. This has the benefit of providing a reliable revenue stream each billing cycle.

Each system charges a volumetric charge based on consumption during the billing cycle. In many cases, this charge has no impact until the fixed quarterly charge is exceeded (as in the example previously mentioned for Newark Valley and Nichols). Several systems have declining charges as consumption increases. This type of structure further recovers fixed costs and makes recognition of the fact that once a large portion of the fixed costs are recovered, the additional cost to provide another unit of consumption is lower.

Table 3 shows the cost per CCF of consumption for each system. Please note that the average price for all of the water systems decreases on a unit cost basis as consumption increases. This is consistent with the concept that each additional unit of consumption is cheaper to produce and deliver because the fixed costs have been substantially recovered. These are important items to consider in rate design.

Table 3: Sampling of Rate Comparisons for Water Service for Tioga County
Cost per CCF of Consumption

Line No.	Usage per Quarter (CF's)	Usage per Quarter (Gallons)	Village of Candor	Village of Newark Valley	Village of Waverly	Town of Barton	Village of Nichols	Village of Owego	Town of Owego	Average of Systems in Planning Area
	A	B	C	D	E	F	G	H	I	J
1	-	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	250	1,870	\$ 9.66	\$ 10.80	\$ 7.80	\$ 7.80	\$ 22.80	\$ 2.93	\$ 5.63	\$ 9.63
3	500	3,740	\$ 4.83	\$ 5.40	\$ 3.90	\$ 3.90	\$ 11.40	\$ 2.93	\$ 3.83	\$ 5.17
4	750	5,610	\$ 4.00	\$ 3.60	\$ 2.60	\$ 2.60	\$ 7.60	\$ 2.93	\$ 3.23	\$ 3.79
5	1,000	7,480	\$ 3.58	\$ 2.70	\$ 2.27	\$ 2.27	\$ 5.70	\$ 2.93	\$ 2.93	\$ 3.20
6	1,250	9,350	\$ 3.33	\$ 2.68	\$ 2.14	\$ 2.14	\$ 4.81	\$ 2.93	\$ 2.75	\$ 2.97
7	1,500	11,220	\$ 3.16	\$ 2.67	\$ 2.06	\$ 2.06	\$ 4.81	\$ 2.93	\$ 2.63	\$ 2.90
8	2,000	14,960	\$ 2.96	\$ 2.65	\$ 1.95	\$ 1.95	\$ 4.81	\$ 2.93	\$ 2.48	\$ 2.82
9	2,500	18,700	\$ 2.83	\$ 2.64	\$ 1.88	\$ 1.88	\$ 4.81	\$ 2.93	\$ 2.39	\$ 2.77
10	3,000	22,440	\$ 2.75	\$ 2.63	\$ 1.84	\$ 1.84	\$ 4.81	\$ 2.88	\$ 2.33	\$ 2.73
11	3,500	26,180	\$ 2.69	\$ 2.63	\$ 1.81	\$ 1.81	\$ 4.81	\$ 2.79	\$ 2.29	\$ 2.69
12	4,000	29,920	\$ 2.64	\$ 2.63	\$ 1.78	\$ 1.78	\$ 4.81	\$ 2.72	\$ 2.26	\$ 2.66
13	4,500	33,660	\$ 2.61	\$ 2.62	\$ 1.77	\$ 1.77	\$ 4.81	\$ 2.67	\$ 2.23	\$ 2.64
14	5,000	37,400	\$ 2.58	\$ 2.62	\$ 1.75	\$ 1.75	\$ 4.81	\$ 2.63	\$ 2.21	\$ 2.62
15	10,000	74,800	\$ 2.03	\$ 2.61	\$ 1.42	\$ 1.42	\$ 3.46	\$ 2.44	\$ 2.12	\$ 2.21
16	15,000	112,200	\$ 1.85	\$ 2.61	\$ 1.30	\$ 1.30	\$ 2.81	\$ 2.14	\$ 2.09	\$ 2.02
17	30,000	224,400	\$ 1.66	\$ 2.60	\$ 1.19	\$ 1.19	\$ 2.16	\$ 1.79	\$ 2.06	\$ 1.81

Overall, the systems within the planning area are generating \$2.82 per CCF for a typical residential household using 15,000 gallons per quarter (Line No. 8). This is just an average and the revenues for the individual systems vary from a low of \$1.95 to a high of \$4.81. Also, if the proposed water system would serve customers with significantly different consumption characteristics, the forecasted usage pattern would need to be further evaluated in the initial planning phases. Furthermore, in order to produce annual revenue projections for the planning area it may be necessary to estimate the total number of consumers served.

Sewer Rates

Only four systems provide sewer service within the planning district. These four systems are the villages of Waverly and Owego, and the towns of Owego and Barton. The rate structure of sewer service is similar to the water tariffs in most cases. Some systems will bill a flat charge for sewer service or use the overall usage on the metered water consumption as the basis for billing rather than separately monitoring actual wastewater volume. In some cases, such as irrigation or the filling of swimming pools, provisions will be made to account for water usage that does not also require wastewater treatment.

A comparison of the pricing of sewer service within the planning area is shown in Table 4. For a typical household using 15,000 gallons each quarter the average charge is \$49.72, or \$198.88 annually for the three systems. Again, there is a wide range between systems and the quarterly charge varies from a low of \$34.75 to a high of \$74.00 per quarter. The unit costs for each system are shown in Table 5. The volumetric charges for these comparisons range from a low of \$1.74 per CCF to a high of \$3.70 per CCF, with the average of the four systems being \$2.49 per CCF. It is important to note that none of the charges illustrated in these tables include debt service that may be incurred and paid via a user's tax bill rather than in their consumptive or service charges.

Table 4: Sampling of Rate Comparisons for Sewer Service for Tioga County

Line No.	Usage per Quarter (CF's)		Usage per Quarter (Gallons)	Village of Waverly			Village of Owego		Town of Barton		Town of Owego		Average of Systems in Planning Area
	A	B		C	D	E	F	G					
1	-	-		\$ 5.75	\$ 45.00	\$ 5.75	\$ 9.00	\$ 16.38				\$ 16.38	
2	250	1,870		\$ 9.38	\$ 45.00	\$ 9.38	\$ 14.80	\$ 19.64				\$ 19.64	
3	500	3,740		\$ 13.00	\$ 45.00	\$ 13.00	\$ 20.59	\$ 22.90				\$ 22.90	
4	750	5,610		\$ 16.63	\$ 45.00	\$ 16.63	\$ 26.39	\$ 26.16				\$ 26.16	
5	1,000	7,480		\$ 20.25	\$ 45.00	\$ 20.25	\$ 32.19	\$ 29.42				\$ 29.42	
6	1,250	9,350		\$ 23.88	\$ 46.25	\$ 23.88	\$ 37.99	\$ 33.00				\$ 33.00	
7	1,500	11,220		\$ 27.50	\$ 55.50	\$ 27.50	\$ 43.78	\$ 38.57				\$ 38.57	
8	2,000	14,960		\$ 34.75	\$ 74.00	\$ 34.75	\$ 55.38	\$ 49.72				\$ 49.72	
9	2,500	18,700		\$ 42.00	\$ 92.50	\$ 42.00	\$ 66.97	\$ 60.87				\$ 60.87	
10	3,000	22,440		\$ 49.25	\$ 111.00	\$ 49.25	\$ 78.56	\$ 72.02				\$ 72.02	
11	3,500	26,180		\$ 56.50	\$ 129.50	\$ 56.50	\$ 90.16	\$ 83.16				\$ 83.16	
12	4,000	29,920		\$ 63.75	\$ 148.00	\$ 63.75	\$ 101.75	\$ 94.31				\$ 94.31	
13	4,500	33,660		\$ 71.00	\$ 166.50	\$ 71.00	\$ 113.35	\$ 105.46				\$ 105.46	
14	5,000	37,400		\$ 78.25	\$ 185.00	\$ 78.25	\$ 124.94	\$ 116.61				\$ 116.61	
15	10,000	74,800		\$ 150.75	\$ 370.00	\$ 150.75	\$ 240.88	\$ 228.10				\$ 228.10	
16	15,000	112,200		\$ 223.25	\$ 555.00	\$ 223.25	\$ 356.82	\$ 339.58				\$ 339.58	
17	30,000	224,400		\$ 440.75	\$ 1,110.00	\$ 440.75	\$ 704.64	\$ 674.04				\$ 674.04	

**Table 5: Sampling of Rate Comparisons for Sewer Service for Tioga County
Cost per CCF of Treatment**

Line No.	Usage per Quarter (CF's) A	Usage per Quarter (Gallons) B	Village of Waverly C	Village of Owego D	Town of Barton E	Town of Owego F	Average of Systems in Planning Area G
1	-	-	N/A	N/A	N/A	N/A	\$ -
2	250	1,870	\$ 3.75	\$ 18.00	\$ 3.75	\$ 5.92	\$ 7.85
3	500	3,740	\$ 2.60	\$ 9.00	\$ 2.60	\$ 4.12	\$ 4.58
4	750	5,610	\$ 2.22	\$ 6.00	\$ 2.22	\$ 3.52	\$ 3.49
5	1,000	7,480	\$ 2.03	\$ 4.50	\$ 2.03	\$ 3.22	\$ 2.94
6	1,250	9,350	\$ 1.91	\$ 3.70	\$ 1.91	\$ 3.04	\$ 2.64
7	1,500	11,220	\$ 1.83	\$ 3.70	\$ 1.83	\$ 2.92	\$ 2.57
8	2,000	14,960	\$ 1.74	\$ 3.70	\$ 1.74	\$ 2.77	\$ 2.49
9	2,500	18,700	\$ 1.68	\$ 3.70	\$ 1.68	\$ 2.68	\$ 2.43
10	3,000	22,440	\$ 1.64	\$ 3.70	\$ 1.64	\$ 2.62	\$ 2.40
11	3,500	26,180	\$ 1.61	\$ 3.70	\$ 1.61	\$ 2.58	\$ 2.38
12	4,000	29,920	\$ 1.59	\$ 3.70	\$ 1.59	\$ 2.54	\$ 2.36
13	4,500	33,660	\$ 1.58	\$ 3.70	\$ 1.58	\$ 2.52	\$ 2.34
14	5,000	37,400	\$ 1.57	\$ 3.70	\$ 1.57	\$ 2.50	\$ 2.33
15	10,000	74,800	\$ 1.51	\$ 3.70	\$ 1.51	\$ 2.41	\$ 2.28
16	15,000	112,200	\$ 1.49	\$ 3.70	\$ 1.49	\$ 2.38	\$ 2.26
17	30,000	224,400	\$ 1.47	\$ 3.70	\$ 1.47	\$ 2.35	\$ 2.25

Comparison to Montgomery County Systems

Montgomery County has a similar topography and population density to Tioga County. The charges for the Montgomery County towns and villages that provide water and sewer service have been analyzed. To make these calculations CHA utilized the New York Conference of Mayors report on Water and Sewer Rates dated February, 1997. These rates have been applied to a customer using 15,000 gallons per quarter to match the rate comparison data for an average customer in Tioga County.

Water service is provided by five systems in Montgomery County. The quarterly charge for service for a household using 15,000 gallons per quarter is shown in Table 6 below.

Table 6: Montgomery County Water System Quarterly Charges

Canajoharie	Fonda	Fort Plain	Fultonville	Palatine Bridge	County-wide Average
\$48.75	\$14.38	\$60.60	\$57.68	\$84.00	\$53.08

The average of these systems, \$53.08, is slightly less than the rate charges in Tioga County. Overall, the Montgomery County systems charge \$212.32 annually compared to \$225.40 for Tioga County, or 5.8% lower.

A similar comparison has been made for the sewer service in Montgomery County as shown in Table 7 below. Five systems provide sewer service, but please note that Palatine Bridge does not provide sewer service, and it has been replaced by Hagaman, which provides sewer service but not water service. Also, Hagaman has a flat annual charge per customer and the rate shown is not dependent on the actual volume of water that is treated for each customer.

Table 7: Montgomery County Sewer System Quarterly Charges

Canajoharie	Fonda	Fort Plain	Fultonville	Hagaman	County-wide Average
\$59.62	\$27.30	\$24.47	\$50.85	\$90.00	\$50.45

The average charge for the three systems is \$50.45 per quarter, or \$201.80 annually. This is slightly higher than the charges shown for Tioga County of \$198.88 per year for an average household. The average customer in Tioga County pays \$2.92 less per year or 1.5% less than a similar customer in Montgomery County. These are only averages and customers on individual systems within each County may pay significantly more or less than the calculations shown.

Comparison to Schuyler County Systems & Town of Union System

Schuyler County also has a similar topography and population density to Tioga County. The charges for the Schuyler County towns and villages (as well as the Town of Union in Broome County) that provide water and sewer service have been analyzed. To make these calculations CHA utilized the New York Conference of Mayors report on Water and Sewer Rates dated February, 1997. These rates have been applied to a customer using 15,000 gallons per quarter to match the rate comparison data for an average customer in Tioga County.

Water service is provided by three systems in Schuyler County (plus the Town of Union in Broome County). The quarterly charge for service for a household using 15,000 gallons per quarter is shown in Table 8 below.

Table 8: Schuyler County Water System Quarterly Charges

Montour Falls	Odessa	Watkins Glen	Union	Average
\$34.88	\$18.50	\$38.13	\$31.23	\$30.69

The average of these systems of \$30.69 per quarter is significantly lower than the rate charges in Tioga County. Overall, the Schuyler County systems (plus Town of

Union) charge \$122.76 annually compared to \$225.40 for Tioga County, or 45.5% lower.

A similar comparison has been made for the sewer service in Schuyler County (and Town of Union) as shown in Table 9 below. Three systems provide sewer service, but please note that the Town of Odessa does not provide sewer service.

Table 9: Schuyler County Sewer System Quarterly Charges

Montour Falls	Watkins Glen	Union	Average
\$25.70	\$39.23	\$17.10	\$27.34

The average charge for the three systems is \$27.34 per quarter, or \$109.36 annually. This is significantly lower than the charges shown for Tioga County of \$198.88 per year for an average household. The average customer in Schuyler County (including Town of Union in Broome County) pays \$109.37 per year; or 45.1% less than a similar customer in Tioga County. These are only averages and customers on individual systems within each County may pay significantly more or less than the calculations shown.

Comparison of costs to private wells and septic systems

The final stage of this analysis compares the cost of providing water and sewer service to other available options, namely wells and septic systems. Not every customer has the option of drilling a well depending on the soil composition and depth of the water table. For residential customers that do have the option, wells can run anywhere from \$3,000 to \$6,000 or more, again depending on the depth of the water table and the soil composition. Assuming an average well cost of \$4,500 and a life expectancy of 30 years, the annual cost to the customer would be \$327 using a 6% discount rate. In addition, the well pump may need to be replaced after about 15 years. The cost of replacing the well pump is estimated at \$750. Therefore, the costs for a private well equate to approximately \$350 per year. In comparison, the costs for public water were shown above to average \$225.40 per year. In addition, many

households are paying debt service retirement, which is a fixed fee that is added to the tax bill to retire debt used for construction of new infrastructure. The debt service retirement varies greatly from location to location in Tioga County from \$0 (no debt service retirement) to \$400 per year. Adding the cost of the average debt service retirement to the costs for water consumption, the cost of public water ranges from approximately \$225 to \$625 per year, which may or may not be higher than the cost of installing a private well, depending on the amount of debt service retirement.

For septic systems, a similar analysis can be made. In reviewing the surficial geology within Tioga County, approximately 85% of the area is located on fine grained glacial till which is poor for sewage percolation and requires a raised bed system. A typical raised bed system would cost approximately \$10,000. The remaining area could utilize a typical leach field septic system which would cost approximately \$4,000 per installation. Using these estimates, the average customer in Tioga County would spend \$6,000 to install a septic system. Again assuming a life expectancy of 30 years and a 6% discount rate, the annual cost to the customer would be \$436 per year. In addition, the septic system is typically pumped out at least once every three years to remove the solids that have settled to the bottom of the septic tank. The cost for this is estimated at \$170 (once every three years). Therefore, the total cost for a private septic system is approximately \$493 per year. The cost of installing a private septic system can be compared to the cost of a public sewer system. As shown above, the cost for installing a private septic system averages \$493 per year. In comparison, the cost for public sewer facilities averages \$198.88. The debt service retirement ranges from \$0 to \$400 per year depending on location, making the public sewer system costs for the average residence \$199 to \$599 per year. The costs for a public sewer system may or may not be higher than the costs for installation and maintenance of a private septic system, depending on the amount of debt service retirement.

D. Grants/Funding Opportunities

Various opportunities exist for the funding of the identified water and wastewater projects in the Tioga County municipalities. Some of these opportunities are grants for partial (or full) funding, while others offer financing at reduced interest rates. As shown in the project costs, many of the projects are not financially feasible without significant funding.

The most traditional funding programs in New York State (NYS) are loans provided by the State Revolving Fund (SRF). These loans are administered by the NYS Environmental Facilities Corporation (EFC) for water and wastewater projects throughout the state. These loans are divided into two (2) categories, the Clean Water SRF and the Drinking Water SRF.

The Clean Water SRF provides low-interest rate financing to municipalities for water pollution control projects including wastewater treatment facilities, sewers, and non-point source projects such as salt storage facilities. The funding is in the form of interest-free short term loans with terms up to three (3) years and low-interest rate long term financing with terms up to thirty (30) years. Any project that will maintain or improve water quality in NYS is eligible for financing through this program.

Although similar to the Clean Water SRF, the Drinking Water SRF provides low-interest rate financing for drinking water projects including upgrades to a system, new treatment facilities, new storage facilities, new transmission and distribution system and the consolidation of multiple water supplies. This funding is in the form of interest-free short-term loans with terms up to three (3) years and low-interest rate long-term financings with terms up to twenty (20) years. All community water systems, whether publicly and privately owned and many non-community, non-profit projects are eligible for this funding, provided that they have a public health benefit. These projects are scored and prioritized by the NYSEFC, with participation from the NYS Department of Health (DOH). Most projects that are ready to proceed and score

above an established funding line are generally funded through this program. This program, however, does have only limited funds available to it.

Some wastewater projects may be eligible for hardship assistance through the Clean Water SRF. These programs are also administered by the NYSEFC and provide reduced interest rates (as low as 0%) for up to thirty (30) years. Municipalities with projects serving residential areas with estimated construction costs under ten (10) million dollars may be eligible. An additional requirement for eligibility is that the total estimated annual sewer service charge (including the debt retirement) must exceed a target service charge as determined by the NYSEFC. This target service charge is based upon median household income (MHI).

The NYSEFC, in cooperation with the NYSDOH, also provides Hardship Assistance for some water projects through the Drinking Water SRF. In addition to providing interest-free loans for twenty (20) to thirty (30) year financing periods, some grants may be awarded. If awarded, these grants may provide for up to 75% of the project costs (up to two (2) million dollars). As with the Hardship Assistance under the Clear Water SRF, the Drinking Water Hardship Assistance is only applicable for projects costing less than ten (10) million dollars. Grant money will only be awarded to projects that cannot achieve the established target user fee with no-interest financing. Communities that have MHI above the NYS average are not eligible for grants. In all cases, the project must score above the funding line for any funding through this program.

Projects in Tioga County may also be eligible for grants for public infrastructure projects that create an opportunity for economic development or eliminate a health and safety threat. The NYS Department of State provides one hundred and fifty thousand dollar (\$150,000) grants for projects under the Appalachian Regional Commission Area Development Program. All projects that address a public health and safety threat that have a consent order are considered by the program, and

projects that address an economic development issue with documented private job creation or retention outcomes are also likely to be funded through this program.

Several other agencies provide funding for water and wastewater projects, including US Department of Commerce Economic Development Administration, the NYS Empire State Development Corporation, and the NYS Energy Research and Development Authority (NYSERDA). The requirements for funding under these agencies vary, as do the awards. Generally, projects considered by these agencies need to be unique and address economic development and/or energy savings issues to be considered for funding.

The Governor's Office for Small Cities administers Small Cities Community Development Block Grants. These grants are for community and economic development activities, wastewater and drinking water facilities, housing and public infrastructure projects. In the public facilities category, grants up to four hundred thousand dollars (\$400,000) are available for cities, towns and villages and up to six hundred thousand dollars (\$600,000) for counties and joint applications. These grants are competitive and are awarded annually. Projects that create or retain jobs for low to moderate income persons may be eligible for grants from one hundred to seven hundred and fifty thousand dollars (\$100,000 - \$750,000) during the Economic Development Open Round. Projects that are considered for funding must primarily benefit low to moderate income persons and help to correct or prevent public health and safety problems, slums, or blight. Prior to requesting funding through the Community Development Block Grants program, the municipality should have made all of their applications to other public funding programs, as necessary. It should be noted that only non-entitlement communities, units of government with populations less than fifty thousand (50,000) and non-urban counties are eligible for grants through this program.

The United States (US) Department of Agriculture Rural Development (RD) offers loans and grants through the Rural Utilities Service Water and Wastewater Disposal

Loan and Grant Program. This program provides loans and grants to water and wastewater facilities and services to low income rural communities whose residents face significant health risks with service area populations up to ten thousand (10,000). Loans with terms up to forty (40) years are available with their interest rates indexed to the MHI of the service area. The loan rates vary with the Bank Rate every three (3) months. These programs are very competitive and the funds are applied to the most financially needy communities. The intention of the program is to provide reasonable user costs for the rural residents of the service area.

The Clean Water/Clean Air Bond Act also provides grants to municipalities for projects that improve water quality. These projects typically include wastewater treatment plant improvements, wastewater collection system improvements, and non-point source pollution abatement and control. Grants provided by the program, administered by the NYS Department of Environmental Conservation (DEC) are for up to 85% of the construction cost. Many of the funds that were previously available under this program have been utilized, but more funds may become available.

In addition to the funding sources listed above, the County should consider enlisting the services of a lobbyist. A lobbyist is a paid professional whose job is to be in constant contact with elected officials (senators, congressmen, etc.) in the hopes of persuading the officials to fund certain projects that the lobbyist brings before them. The lobbyist encourages the officials to add member item grants to bills passing through congress. The member item grants allow municipalities (such as Tioga County) to obtain funding that would otherwise be unavailable to them. Funding of the magnitude given in member item grants would aid the County in pursuing the costs of both health & safety and economic development projects by providing grants for design, construction, and administration.

VI. Recommendations

A. Priority Projects

This section outlines recommendations for water and sewer projects based on research, utility information, community interviews and other information provided in previous sections of this report. The steering committee identified the highest priority projects based on the project ranking found in Appendix D entitled *Project Ranking Materials*. The top fifteen highest priority projects are:

1) United Water Nichols - Second Well

Project involves the construction of a potable water well for redundancy in case the Village's only functioning well becomes contaminated. Project includes test well, one potable water well, 1,000 linear feet of water main, electrical, chemical feed system with building, telemetry from new well to existing water tank, and appurtenances.

2) V. of Waverly - 2 MG Reservoir

Project involves the construction of a two million gallon water storage tank to add to the water storage capacity that the Village has. The Village currently supplies more water than it can store. The project includes construction of a new water storage tank next to the existing tank, concrete foundation, site piping (500 linear feet assumed), and appurtenances.

3) V. of Newark Valley - Two New Reservoirs

Project involves the replacement of the Village's existing reservoir with a new reservoir as well as construction of an additional reservoir west of the creek. Project includes two 400,000 gallon (size assumed) water storage tanks, new access road at each tank site, approximately 2,000 linear feet of new water main, electrical, telemetry upgrades from the existing wells to the new tanks, and appurtenances.

4) T. of Barton - New Well and Booster Station

Project involves the construction of a new well and booster pump station for the Town's water system. Project includes test well, one potable water well, site piping, pre-packaged booster pump station, chemical feed system, electrical service, telemetry, site work and appurtenances.

5) T. of Nichols Waterline Extension - Lounsberry to Village of Nichols

Project involves extending public water from the Lounsberry water plant in the Town of Nichols, along East River Road, to the Village of Nichols (including Kirby Park). The existing well in the Village would be abandoned and the Village would

buy water directly from the Town. Project includes 25,000 linear feet of water main (along Stanton Hill Road and East River Road), 129 new water services (residents along East River Road), a meter pit (to meter and bill the water supplied to the Village), abandonment of the Village's water well, construction of a third potable water well for the Lounsberry water plant, and construction of a second water storage tank at the Lounsberry tank site.

6) V. of Candor - New Well

Project involves the construction of a new potable water well for the Village. Well is needed to support economic development by supplying additional quantities of water where needed. Project includes test well, one new potable water well, 500 linear feet of water main, chemical feed system with associated control building, electrical, telemetry from new well to water tank, and appurtenances.

7) County Wide Compost Facility

Project involves creation of a compost facility for sludge disposal. The facility would be available for use by county sewage treatment plants. The project includes a feasibility study, land acquisition, construction of a static pile compost facility, purchase of equipment (aerator, front end loader, dump truck, etc.), and appurtenances.

8) V. of Newark Valley - Water Main & Hydrant Replacement

Project involves the replacement of approximately 75% of the Village's water main along with 67 fire hydrants, due to their age. Project includes water main replacement (areas to be determined), fire hydrant replacement, site restoration, and appurtenances.

9) V. of Waverly - Water Main Extensions

Project involves extension of public water from the Village at the Broad Street Extension Bridge and from in front of the sewage treatment plant to the dog food plant. The project also involves replacement of water main on Fulton Street, Lyman Avenue, Spring Street, and Garfield Street. Project includes 9,000 linear feet of water main extension/replacement and appurtenances.

10) V. of Candor - Sewer System

Project involves the creation of a sanitary sewer system to cover the entire Village. Project includes 120,000 gpd sewage treatment plant, 25,000 linear feet of sewer main, sewer laterals, and appurtenances.

11) V. of Waverly - Sludge Disposal

Project involves dealing with the increasing problem of sludge disposal from the Village's wastewater treatment plant. The Village currently landfills the sludge from the plant but other

alternatives are needed. Project includes a feasibility study for disposal alternatives.

- 12) **T. of Owego - Rt. 38 Industrial Park Well Modifications**
Project involves modifying the Rt. 38 industrial park well to increase growth at the park by increasing the amount of water supplied by the well. Project includes well investigation, new well pump and motor, new electrical service, and appurtenances.
- 13) **V. of Nichols - New Plant and Sewer Creation in Village**
Project involves creating a new sewer district to serve the Village of Nichols. Project includes 18,500 linear feet of sewer main, 219 sewer laterals (including Kirby Park), two sewage pump stations, and a 120,000 gpd sewage treatment plant. This project would not serve any residences along East River Road outside the Village limits.
- 14) **V. of Waverly - Dam Spillway Reconfiguration**
Project involves the reconfiguration of the dam spillway, which is part of the Village's surface water system. The spillway needs to be reconfigured to reduce turbidity in the lower reservoir and allow the sand filter to operate more efficiently.
- 15) **V. of Newark Valley - Sewer System Creation**
Project involves the creation of a sanitary sewer system in the Village. Project includes 120,000 gpd sewage treatment plant, 32,000 linear feet of sewer main (to cover the entire Village), three pump stations, sewer laterals, and appurtenances

The following projects have been identified as Medium Priority Projects:

- 16) V. of Candor - New Water Tank
- 17) V. of Spencer - Water System Creation
- 18) V. of Owego - Sewer Main Upgrade for Owego Middle School
- 19) United Water to Owego Interconnect - Water main Extension from Dean Street to Metros
- 20) T. of Nichols Waterline Extension - Lounsberry to Village of Nichols and Tioga Park **
- 21) V. of Candor - Water main Replacements
- 22) T. of Richford & Berkshire - Sewer System
- 23) V. of Nichols - Water System Extension to Kirby Park
- 24) T. of Owego - Water & Sewer Extension to Day Hollow Rd.
- 25) V. of Spencer - Sewer System Creation
- 26) T. of Owego - New Reservoir at Forest Hill
- 27) United Water Owego - Water System Creation (Canawatee)
- 28) V. of Nichols - New Plant and Sewer Creation in Village and to Tioga Park **
- 29) T. of Tioga - Sewer System Upgrades

30) T. of Owego - Rt. 434 Water System (Hilton to Marshland)

The following projects have been identified as Low Priority Projects:

- 31) T. of Tioga - Water System Upgrades
- 32) V. of Newark Valley - Reeves WD Water main Replacement
- 33) T. of Richford & Berkshire - Water System
- 34) V. of Newark Valley - Water Extension to School & Belmont Billings
- 35) T. of Owego - Rt. 434 Sewer System (Hilton to Marshland)
- 36) T. of Owego - Sewer Extension to Caferty Hill
- 37) T. of Barton - Water System Extension
- 38) T/V. of Owego & T. of Tioga - Rt. 96 Tie in Water and Sewer to Metro Site
- 39) V. of Candor - Water Meter & Billing Software Replacement
- 40) V. of Newark Valley - Water Upgrade to Fire Station
- 41) T. of Barton - Sewer System Extension
- 42) T. of Nichols Waterline Extension - Lounsberry to Kirby Park **
- 43) T. of Nichols Sewer Extension - Lounsberry to Kirby Park **

** Mutually exclusive from another project

It is recommended that Tioga County implement the proposed projects, giving priority to the steering committee's top fifteen highest priority projects. Chapter VII describes the implementation process of the top fifteen projects in greater detail. In addition to the highest priority projects mentioned above, the County may wish to consider several additional opportunities.

B. Connecting Richford & Berkshire with Newark Valley

The original project description for creation of a new water system to serve the Towns of Richford and Berkshire included extending a watermain between the towns in lieu of each town having a separate water system. A watermain along State Route 38 was included to connect the two towns and the Village of Newark Valley has expressed an interest to be included in this new water district. The Village would supply the water to Richford and Berkshire through a watermain instead of water being supplied from wells in Richford as originally intended. The Village would benefit by the additional revenue of selling water to the two towns and the towns would benefit by not needing to construct and maintain a water supply source; they would only need to maintain their water distribution system.

C. Connecting the Existing Watermain on State Route 38 with State Route 96 in the Town of Tioga

State Route 96 in the Town of Tioga could be developed as a key economic corridor in Tioga County. Typically, economic growth is fostered by the introduction of water and sewer infrastructure in the area. We recommend that the County consider providing public water and sewer to this corridor by connecting it with the infrastructure on State Route 38 in the Town of Owego.

D. Study the Feasibility of Creating a Water and/or Sewer Authority

It is recommended that Tioga County study the feasibility of creating a Tioga County Water and/or Sewer Authority. A water/sewer authority would link all existing and proposed districts (both village and town) together under one organization. The authority would govern and control each district (through a board of directors) and would be responsible for day-to-day operations, money and asset management, and all other aspects of the districts (which would become one under the authority).

At present, water districts already exist in the towns of Barton, Nichols, Owego, Tioga, and the villages of Candor, Newark Valley, Nichols, Owego, and Waverly. Each of these districts would be combined to form the Tioga County Water Authority. In addition, possible future water districts in the towns of Richford, Berkshire, and Spencer would also become part of the authority.

Currently, the towns of Nichols, Owego, Tioga, & Barton, and the villages of Owego and Waverly have sewer systems. All these districts would become part of a sewer authority. In the future, the towns of Richford & Berkshire and the villages of Spencer, Newark Valley, Candor, and Nichols may create sewer systems and also become part of a sewer authority.

Another opportunity similar to the development of an authority would be to privatize water and sewer districts. This has been done in the villages of Owego and Nichols. Privatization means that a separate, privately owned, for-profit company is

responsible for operating and maintaining a water or sewer district through a contract with the town or village. Currently, only the villages of Owego and Nichols are privatized. In some cases, however, it has been shown that towns and villages that operate and maintain their own systems may be more cost-effective in the long run. Therefore, privatization in Tioga County is not recommended.

E. Best Management Practices

Best Management Practices (BMP's) are measures performed by municipalities and agencies that increase efficiency and productivity and can also protect the integrity of the system and the safety of the community.

Operations and Maintenance

BMP's for operations and maintenance of infrastructure systems allow for more efficient automated billing and metering, better GIS based system management, enhanced leak detection and mitigation, more efficient manhole and sewer inspections, scheduled and unscheduled maintenance, better health department and DEC monitoring, capital improvement planning and implementation, increased bonding authority, better public communication, and master plan review and updates. A more detailed discussion of implementing BMP's can be found in Chapter VII.

Municipal Governance Best Management Practices

In addition to the BMP's listed above, the County may wish to consider regulation of private septic systems. Private septic systems, although generally small in size, are considered a point source for groundwater pollution since they involve a subsurface discharge of sewage which is treated only for the removal of solids (in the septic tank). More importantly, septic systems which are aging or poorly constructed and are located near a surface water body can and do contribute to the pollution of the water body. Although wastewater treatment plants discharge their effluent into water bodies, the effluent is treated (including removal of solids, aerobic digestion, anaerobic digestion, and disinfection) such that the effluent water leaving the treatment plant does not contribute to the pollution of the water body. In addition,

wastewater treatment plants are regulated by the NYSDEC whereas private septic systems are generally not regulated.

Many communities, through watershed improvement groups, have been constructing public sewers to replace aging septic systems that contribute to the pollution level of lakes.

Finally, during the community interview process several municipalities indicated that their municipal wells are either contaminated or are currently experiencing a serious threat of contamination. One proactive method to prevent potential contamination of wellhead sites and direct zones of contribution is to manage growth through zoning. Local municipalities within New York State have the power to adopt Wellhead Protection Overlay Ordinances that are designed to protect municipal wells by regulating permitted uses and activates within delineated zones of contribution. Wellhead Protection Ordinances protect wellheads by restricting uses, establishing density limits, limiting lot coverage, regulating setbacks, imposing special use permits, and identifying performance standards. Wellhead Protection Ordinances are inherently a very effective best management practice (BMP) and, it is therefore recommended that municipalities review, update, or create a Wellhead Protection Overlay Ordinance to restrict uses and activities that contain pollutants, which may be a source of contamination that poses a threat to ground water resources.

F. Intermunicipal Agreements

Intermunicipal agreements between municipalities are recommended. Agreements can include objectives such as extending infrastructure services from neighboring districts (watermain connections) as well as written agreements between established districts. One situation in which intermunicipal agreements are advantageous is the provision of emergency back-up supply of potable water. For example, if an interconnection was formed between the Town of Nichols and the Village of Nichols, the Village could “buy” water from the Town in the event the Village well was out of service. The Village would not lose its entire water system due to a malfunction of its

only well, but would be serviced by the Town until the Village's well could be repaired or replaced. Intermunicipal agreements between the following municipalities are recommended:

1. Village of Nichols and the Town of Nichols.
2. Town of Owego and Broome County municipalities.
3. Village of Newark Valley and the Town of Owego (through future projects).
4. Village of Spencer and the Village of Van Etten (through future projects).
5. Town of Tioga and Town of Owego.
6. Village of Newark Valley and Towns of Newark Valley, Richford & Berkshire (through future projects).

G. Memoranda of Understanding

Memoranda of Understanding (MOU) are another example of intermunicipal cooperation that may be advantageous for the County. MOU's are similar to intermunicipal agreements but are generally limited to a specific project or time limit. As stated in the intermunicipal agreements paragraph, MOU's are a way of providing services and cooperation between neighboring districts and/or municipalities.

H. Funding Sources

It is recommended that Tioga County as well as its Towns and Villages pursue the funding sources that were previously discussed in Section V.

I. Reviewing/Updating the Infrastructure Master Plan

Tioga County should *review the IMP every year and update as necessary*, especially after infrastructure projects are completed and after new legislation and mandates are passed by governmental agencies that affect water and wastewater projects. *Major updates to the IMP should occur on five (5) year intervals* following the Plan's adoption by the County Legislature. It is important to note that master plans (including the IMP) are documents that must evolve (i.e. must be updated) as projects are implemented and when issues, laws, and mandates change. This allows

municipalities to address new issues as they arise, thereby being proactive and not reactive by informing decision makers about the most efficient expenditure of limited community resources.

VII. Implementation Strategies

A. Priority Projects

As mentioned in Chapter VI, the highest priority projects (as ranked by the steering committee) are:

- 1) United Water Nichols - Second Well
- 2) V. of Waverly – 2 MG Reservoir
- 3) V. of Newark Valley - Two New Reservoirs
- 4) T. of Barton - New Well and Booster Station
- 5) T. of Nichols Waterline Extension - Lounsberry to Village of Nichols
- 6) V. of Candor - New Well
- 7) County Wide Compost Facility
- 8) V. of Newark Valley - Watermain & Hydrant Replacement
- 9) V. of Waverly - Watermain Extensions
- 10) V. of Candor - Sewer System
- 11) V. of Waverly - Sludge Disposal
- 12) T. of Owego - Rt. 38 Industrial Park Well Modifications
- 13) V. of Nichols - New Plant and Sewer Creation in Village
- 14) V. of Waverly - Dam Spillway Reconfiguration
- 15) V. of Newark Valley - Sewer System Creation

A table showing the final rank for all projects can be viewed in Appendix D, entitled *Project Ranking Materials*. A discussion regarding the implementation of the highest priority projects are described below.

1. United Water Nichols – Second Well

This project received the highest ranking by the steering committee. The first step is to perform preliminary work for this project. Subsurface investigations and test wells need to be performed to determine a suitable location for a new well. The new well must provide the Village's required water quantity as well as the TCDOH required water quality (for drinking water).

Once a suitable well location has been identified, an engineering report needs to be prepared to outline the proposed work including permanent well drilling, piping, valves, chemical feed equipment, electrical & telemetry equipment, and

appurtenances. The report should also make recommendations for implementation of the proposed work, estimate construction costs, and propose an implementation schedule.

After completion of the engineering report and approval of the report by the TCDOH, design can begin. Design will include topographic survey, hydraulic calculations, construction document preparation and review by the TCDOH.

After design is complete and approved by the TCDOH, a public bidding process can be held. The process includes advertising the project in local newspapers and requesting sealed bids from qualified construction contractors. Once bids are submitted, construction contractors can be chosen for the work (based on the lowest responsible bid) and then construction can begin.

Through the design and construction process, the water system operators must be consulted to minimize delays and construction problems caused by the proposed construction work. In general, existing water and sewer systems must be kept “in-service” while construction is ongoing so that local residences are not without service.

2. Village of Waverly – Two Million Gallon Reservoir

This project includes the construction of a new two million gallon (MG) reservoir for water storage. The reservoir site has already been chosen (next to the existing reservoir) so the preliminary work is minor. An engineering report needs to be prepared detailing reservoir sizing, subsurface investigation, hydraulic calculations, estimated project costs, and proposed implementation schedule. The report should be reviewed and approved by the TCDOH.

After approval, the design will include: topographic survey, tank construction plans (with sections and details), construction document preparation, and appurtenances.

We anticipate the need for only one construction contract to complete the work. The design should be reviewed by the TCDOH prior to construction.

After approval, the project should be publicly bid as outlined in project number 1 shown above.

3. Village of Newark Valley – Two New Reservoirs

This project includes the construction of two new water storage reservoirs for the Village's water system. Preliminary work includes finding a location for one new reservoir (the other reservoir will replace an existing tank and will be located next to the existing reservoir) and subsurface investigations. After the preliminary work is complete, an engineering report should be prepared which outlines the proposed work, including reservoir siting, hydraulic calculations, reservoir sizing, access road to the new reservoir, and electrical/telemetry upgrades. The report should be reviewed and approved by the TCDOH.

Following the completion of the engineering report and approval of the report by the TCDOH, design can begin. Design will include topographic survey, hydraulic calculations, construction document preparation, and review by the TCDOH. After design is complete and approved by the TCDOH, a public bidding process can be held as described in previous paragraphs.

4. Town of Barton – New Well and Booster Pump Station

This project involves the construction of a new potable water well and a new water booster pump station to supplement the Town's existing water system. For the new well, subsurface investigations and test wells will need to be performed to determine a suitable location.

Once a suitable well location has been identified, an engineering report needs to be prepared to outline the proposed work including permanent well drilling, piping, valves, chemical feed equipment, booster pump station components and location,

electrical & telemetry equipment, and appurtenances. The report should be reviewed and approved by the TCDOH.

Once the report is approved, design of the project can begin. The design will include topographic survey, hydraulic calculations, and construction document preparation. The construction documents need to be reviewed and approved by the TCDOH.

After approval, the project should be publicly bid as described in previous paragraphs.

5. Town of Nichols Waterline Extension – Lounsberry to the Village of Nichols

This project involves the conveyance of potable water from the Town of Nichols water system (in Lounsberry) to the Village of Nichols to provide the Village with an alternative source of potable water. The project includes watermain extension and the construction of a new potable water well. Preliminary investigation will include subsurface investigation and test wells to determine a suitable location for a third well (to supplement the town's two existing wells). The engineering report for this project will include a description of the routing of a new watermain along East River Road to the Village, parameters of the new well, hydraulic calculations, electrical/telemetry upgrades, metering pit (to meter water conveyed to the Village from the Town), and appurtenances. Design of the project will include topographic survey, hydraulic calculations, and construction document preparation. Both the engineering report and the construction documents will need to be approved by the TCDOH.

In addition to the engineering report, a Map, Plan & Report needs to be prepared to create a water district and/or improvement area along East River Road, such that the residents along East River Road may connect to the new watermain. This report is required by Town Law when extending a water and/or sewer district/improvement area. The Map, Plan & Report would include background information, description of the proposed action, estimated construction and operation & maintenance (O&M) costs, equivalent dwelling units (EDUs) served, and cost per single family residence.

The cost per year per single family residence must be less than a threshold amount (approximately \$500) or the report must be reviewed and approved by the New York State Department of Audit and Control.

After all approvals are obtained, the project can be publicly bid as described in previous paragraphs.

6. Village of Candor – New Well

This project is similar to the project described in project number 1 shown above in that the Village wishes to construct a new potable water well to supplement the existing water system. The implementation of this project (preliminary work, report, design, bidding, etc.) is identical to the new well project for United Water described in project number 1.

7. Countywide Compost Facility

This project involves the implementation of a county-wide compost facility. In order to progress this project, a suitable site will need to be obtained based on calculated acreage needs (for each sewage treatment plant). The County would need to have the proposed site approved by the New York State Department of Environmental Conservation (NYSDEC). After approval is obtained, the County can purchase the property. Once the property is purchased, the County will need to purchase equipment (skidsteer, backhoe, etc.) for spreading the sludge deposited by sewage treatment plants. In addition, the County should adopt a standard operating procedure for the use of the compost facility.

8. Village of Newark Valley – Watermain and Hydrant Replacement

This project involves the replacement of approximately 75% of the Village's watermain and 67 hydrants due to their age. This project should begin with research of the Village's records to ascertain which watermain sections and hydrants are the highest priority for replacement (based mainly on age and repair history). The water

system operator should also be consulted on the prioritization of the replacements, since he/she may have additional information not contained in records.

Once the prioritization is complete, the design can begin. Note that an engineering report is not required in this case, since the project is considered a replacement-in-kind. Design will include topographic survey and construction document preparation. The construction documents will need to be reviewed by the TCDOH. After approval, the project should be publicly bid as described in previous paragraphs.

9. Village of Waverly – Watermain Extensions

This project involves the replacement and extension of public water service in several areas of the Village. While the watermain replacements are considered a replacement-in-kind, the extension involves new watermain, which in turn, requires an engineering report. Design will include hydraulic calculations and construction document preparation. Both the report and the construction documents will need to be approved by the TCDOH. After approval, the project should be publicly bid as described above.

10. Village of Candor – Sewer System

This project involves the creation of a public sewer system within the Village of Candor. The first step is to locate a suitable site for a new sewage treatment plant (generally located near a body of water). An engineering report will need to be prepared which describes the proposed sewer system, including hydraulic calculations, full description of the proposed sewage treatment plant, locations of the new sewer mains, etc. This report will need to be reviewed and approved by the TCDOH. After approval, the design of the project can begin. The design includes construction document preparation (sewage treatment plant work, sewer main & manhole work, electrical & process controls, site work, etc.). The construction documents will need to be submitted to the TCDOH for review and approval. After approval, the project should be publicly bid as described in previous sections. In this

case, multiple construction contracts would be needed (General Construction Contract, Electrical Contract, Plumbing Contract & HVAC Contract).

Please note that this is the first of the high priority projects described which requires the municipality to hire or contract the services of a sewer system operator. This operator will need to be a New York State Department of Health Certified Sewer Operator.

11. Village of Waverly – Sludge Disposal

This project involves the preparation of an engineering report to address the growing concerns over the disposal of sludge from the Village's sewage treatment plant. The report should include several options on alternative methods of sludge disposal along with recommendations and proposed implementation strategies. The report should be coordinated with the TCDOH and the NYSDEC.

12. Town of Owego – Route 38 Industrial Park Well Modifications

This project involves the modification of the existing Route 38 potable water well to provide additional quantities of water. The project should begin with well testing to determine how much additional capacity can be obtained from the well. The design should include construction documents needed to replace the well pump and motor larger units as well as upgrade the electrical service to the motor. Construction documents would need to be approved by the TCDOH. After approval, the project would be publicly bid as described in previous paragraphs.

13. Village of Nichols – New Plant and Sewer Creation in the Village

This project is similar to the project described in project number "10" above. The Village of Nichols would like to create a public sewer system for the Village. The project components and implementation are identical to the project in Candor.

14. Village of Waverly – Dam Spillway Reconfiguration

This project involves the reconfiguration of the Village's dam spillway to reduce turbidity and allow the Village's sand filter to work more efficiently. Engineering studies have previously been performed for this project through the U.S. Army Corps of Engineers. Design will include preparation of construction documents, which will need to be approved by the TCDOH. Once approval is obtained, the project should be publicly bid as described above.

15. Village of Newark Valley – Sewer System Creation

This project is similar to the project described in project number "10" above. The Village of Newark Valley would like to create a public sewer system for the Village. The project components and implementation are identical to the project in Candor.

In addition to the projects listed as high priority, CHA advises the County to consider implementation of two projects that did not make the high priority list, but that are still worth considering in the near future. They are:

- *Village of Spencer – Water System Creation*
- *Towns of Richford and Berkshire – Water System Creation*

Both projects would increase the economic development of their respective areas as well as protect the health and safety of the residents by providing public drinking water in lieu of the use of private wells.

In addition to the high priority projects and the two additional projects mentioned above, the County should consider the following:

B. Connecting Richford & Berkshire with Newark Valley

As discussed in the Recommendations section of this report, the Village of Newark Valley has expressed an interest in providing potable water to the Towns of Richford and Berkshire. In order to progress this project, an engineering study of the Village's water system would need to be undertaken in order to understand the extent of the upgrades that the Village would need in order to be able to supply potable water not

only to Village residences but also to Richford and Berkshire. It is very likely that at least one additional potable water well and one additional water tank is required.

Once the engineering study is complete, an engineering report and two “Map, Plan & Reports” would need to be completed as the basis for an intermunicipal agreement. The engineering report would need to include the results of preliminary investigations for locations of a new well in the Village. Once the reports are approved, the design could begin. The design will include topographic survey, hydraulic calculations, and construction document preparation. The construction documents need to be reviewed and approved by the TCDOH. Once the construction documents are approved, the project would be publicly bid as described in previous paragraphs.

C. Connecting the Existing Water and Sewer on State Route 38 with State Route 96 in the Town of Tioga

If the proper infrastructure existed, State Route 96 (and State Route 38) could be a location for major economic development. The watermain (and sewermain) in the Town of Owego could be extended into the Town of Tioga to provide the necessary infrastructure to stimulate economic growth in this area. As mentioned in previous sections, an engineering report would be needed to detail the work, including preliminary water and sewermain routing, estimated project costs, hydraulic calculations and pipe sizing, and an implementation schedule. The report would need to be reviewed and approved by the TCDOH. This report would become the basis for an intermunicipal agreement.

After the report has been approved, the design should include watermain routing, pipe and valve sizing, construction document preparation, and appurtenances. The design will need to be approved by the TCDOH prior to construction. After approval, the project can proceed to the bidding and construction phases as described in previous sections.

D. Study the Feasibility of Creating a Water and/or Sewer Authority

Currently, several small water and sewer districts exist in Tioga County, each operating independently. A water and/or sewer authority could be formed under New York State's Public Authorities Law that combines all the districts into one authority. The authority would be charged with the day-to-day operations and maintenance of its district. Several "Best Management Practices" could be achieved with the formation of an authority. (Please see Section E, entitled *Best Management Practices*.)

The creation of a water and/or sewer authority gives the County's current water and sewer districts several advantages. The key advantage is financial. While a town or village is limited to a set amount for bonding (borrowing money), the money bonded by an authority is not counted in each towns' (or villages') bond limit. In effect, an authority may have greater bonding power than several small towns and villages. Another advantage is consolidation of services. While each town and village with a water district currently has its own governing board, a water authority would eliminate the need for separate governing boards and replace it with one governing board. In addition, each town and village would have access to all authority owned equipment (water/sewer mains, valves, construction equipment, utility trucks, etc.).

The process of documenting the steps necessary to create a water/sewer authority is beyond the scope of this report and should be completed by an attorney (County's attorney and an attorney from each municipality affected).

A good example of a water authority is the Onondaga County Water Authority (OCWA), which serves most of Onondaga County (excluding the City of Syracuse) as well as parts of Oswego, Oneida, and Madison counties. OCWA currently serves 340,000 customers with more than 44 million gallons per day through more than 1,500 miles of watermain. OCWA boasts a strong association with several sources of water (in the event of an emergency, water can be diverted from other areas that OCWA serves), an association organized to provide virtually uninterrupted potable

water supply with excellent operation & maintenance, and an easy-to-pay billing structure. The benefit to the communities served by OCWA include removing the need for each municipality to operate and maintain a water district, excellent emergency response for maintenance problems, and possibly lower billing rates than would have been realized with individual water districts. Through consolidation of services and equipment, OCWA is able to keep its residential billing rates to approximately \$1.84 per 1,000 gallons or approximately \$33 per quarter (for 15,000 gallons water usage per quarter). This is approximately 44% lower than the average bill for residents in Tioga County. In general, OCWA's clients are satisfied with the service provided. More information can be found on OCWA's website at www.ocwa.org or by contacting Tony Geiss, P.E. at (315) 455-7061.

E. Best Management Practices

Best Management Practices (BMP's) are work tasks performed by municipal agencies that increase the efficiency and productivity of their system. Both formation of a water and/or sewer authority and the use of intermunicipal agreements could include BMP's to aid in the day-to-day and long term operations and maintenance of Tioga County's water and sewer systems. BMP's for water and sewer districts include:

- Automated billing and metering: The County could begin a county-wide metering and billing system for all county water and sewer facilities. The County would need to begin by changing many of the current water meters such that every meter in the County would be identical. As meters are updated, the County could begin to automate and consolidate billing services. The billing records would be kept on one computer system and the bills would be generated and mailed by the one system. As a result, there is a reduction in the duplication of services as only one database/system is required to meter, read, and bill. The water meters in the County would be gradually updated until every meter in the County was linked to the County-wide metering and billing system.
- GIS based system management: The Geographic Information System (GIS) is an ideal method for keeping records of existing infrastructure. Under this system,

each existing water and sewer district in the County would provide the GIS preparer with details on their water system and sewer system which would be entered into the GIS database. System information would include location, size, date of installation, and maintenance records of pipes, valves, pumps, tanks, manholes, etc. The advantage of the GIS is that it not only keeps records of infrastructure components, it assists the water and sewer district personnel in locating the components (such as finding the nearest water valves during a watermain break).

- Leak detection and mitigation: The County could begin a leak detection program to be proactive on detecting and repairing watermain leaks. The first step would be to research each water district's records to prioritize the leak detection process. Each water district would provide (based on their records) a list of probable leaking watermains. These watermains would then be tested for leaks and repaired as necessary. Prioritizing the leak detection process would allow the County to spend valuable time and resources on only the most necessary watermain sections. Sections tested and/or repaired could be added to the GIS described above for record keeping purposes.
- Manhole and sewer inspections: In addition to leak detection, the County could begin a manhole and sewer inspection. Each sewer district would submit a list of probable leaking sewer sections and manholes. These lists would be used to create a prioritized list for investigation and repair. Investigations would include television inspections, flow monitoring, visual inspections of manholes, and smoke testing. Repairs would be made on an as-needed basis, based on the results of the investigation. Results of the investigation and repairs made could be added to the GIS system described above.
- Scheduled and unscheduled maintenance: Pooling of resources between individual water and/or sewer districts would allow the County to perform scheduled and unscheduled maintenance in a more efficient manner. Resources (manpower and equipment) could be pulled from other districts where needed.
- Health department and DEC monitoring: Both the health department and the Department of Environmental Conservation require monitoring of water and

wastewater facilities. A county-wide water or sewer district would allow the County to more efficiently comply with the regulation requirements.

- Capital improvement planning and implementation: Capital improvement planning involves planning and timing of required utility upgrades (water and sewermain replacements, water tank replacements, water or sewer plant rehabilitation, etc.) such that the finances and resources are used most efficiently. In addition, through a County-wide system, individual water and sewer districts that struggled to maintain their systems would be in a better position for planned maintenance and improvements through the sharing of resources.
- Bonding authority: As discussed in previous sections, a county water or sewer authority may have bonding power greater than that of the individual water and/or sewer districts. This increased bonding authority could be used for capital improvement and planning as well as scheduled maintenance.
- Public communication: As an authority, the County could handle all communication with the public more efficiently than individual water and/or sewer districts. Examples would include: public notifications, water/sewer billings, water or sewer authority web site, and public education programs (such as for water conservation).
- Master plan review and updates: Review and updating of the County's master plan is essential in that it allows the County to actively respond to the needs and opportunities of its constituents.
- Septic System Regulations: Tioga County should consider the regulation of private septic systems in two distinct manners. First, the Tioga County Health Department should review the alternate design septic systems, which is required by the Public Health Law of New York, Appendix 75-A. Secondly, the Tioga County Health Department should develop a method to educate appropriate municipal officials on the importance of proper septic system maintenance and encourage the development of septic system maintenance ordinances that would require periodic septic system pumping, among other practices.

Additionally, a study should also be conducted to inventory water bodies, groundwater, and septic system density within the County and determine where public sewers would benefit the communities by reducing the pollution effects on water bodies and groundwater due to the private septic systems. Two good examples of areas to be included in the study would be the residents along East River Road in the Town of Nichols and Village of Nichols (within 100-feet of the Susquehanna River) and residents in the Village of Spencer, where the wells and septic systems are in close proximity.

- Wellhead Protection Overlay Ordinance: The Town of Owego within Tioga County has a wellhead overlay ordinance that restricts development within 2,500 feet of a wellhead and the Village of Nichols has village-wide regulations restricting certain land use activities. Both wellhead ordinances can be used as models to help protect groundwater resources. When reviewing, updating, or creating a Wellhead Ordinance, a local municipality should establish a steering/advisory committee comprised of County officials from the Department of Health, Agriculture, Planning, and Economic Development, local planning staff, local business and property owners, and the municipal attorney. Often, professional expertise is solicited for delineating zones of contribution within an aquifer based on estimated times of travel for pollutants to reach a wellhead. The municipality will then use the information to create new zoning overlay districts that will manage growth by restricting uses and activities that threaten the wellhead. Wellhead overlay ordinances should be reviewed and updated as new information regarding groundwater flow, direct zones of contribution, and development patterns is obtained. Town or Village Boards will have to review and adopt any changes to, and/or the establishment of, a Wellhead Protection Ordinance. Municipal Law also requires the County to review proposed ordinances (or proposed changes to existing ordinances) and allows for recommendations prior to adoption by the local municipality.

F. Intermunicipal Agreements

Creating intermunicipal agreements between water and/or sewer districts or facilitating the extension of water and/or sewer infrastructure is beneficial in that they provide the framework for an agreement to provide water and/or sewer services to neighboring communities in the event of a failure of a part of the neighbors' water and/or sewer system or in the absence of infrastructure altogether. The framework for an intermunicipal agreement, whether between existing districts or an improvement area extension, should be drafted by an attorney. Several "Best Management Practices" could be realized from the use of intermunicipal agreements. (Please see Section E, entitled *Best Management Practices*.)

A good example of an intermunicipal agreement for water services is between Broome County, the Town of Union and the Village of Johnson City. Broome County recently constructed a new potable water system to provide water to the County airport and landfill. Under this agreement, the County buys water for its system from the Town of Union, who buys the water from the Village of Johnson City. In addition, the water system operator from Johnson City also operates and maintains the County's water system under this agreement. Each municipality benefits from this agreement. The County benefits by not having to construct a potable water well of its own (since it buys water from Union) and not having to hire a water system operator, since Johnson City operates the system. The Town of Union benefits by profiting from the sale of water to the County. The Village of Johnson City's benefit is the profit realized from providing the water operation & maintenance services as well as the profit from selling water to the County through the Town. Although this intermunicipal agreement is only a few years old, it appears that all involved parties are amenable to it. Two good contacts regarding this agreement would be Ray Standish, P.E., Deputy Commissioner of Engineering for Broome County (607-778-2909) and Robert Bennett, P.E., Water System Operator for the Village of Johnson City (607-797-3031).

A second example of an intermunicipal agreement is for the provision of water and sewer from the Village of Waverly to the Town of Barton. Water and sewer infrastructure has just been recently extended from the Village line northward along Route 34 and westerly along Route 17C. The Town, which has created a town-wide improvement area, contracts with the Village for operation and maintenance of the Town's water and sewer systems in the improvement area. In addition, the Town and Village have an agreement that allows one municipality to buy water from the other in case of an emergency. This benefits both municipalities by having a back-up source of potable water.

G. Memoranda of Understanding

Similar to intermunicipal agreements, a memoranda of understanding (MOU) is an efficient way to share services between water and/or sewer districts. A MOU is a temporary agreement between districts for services. For example, a water district may create an MOU with a neighboring water district/improvement area for emergency assistance in repairing watermain breaks. In this case, each district would share manpower and equipment for a common goal. As stated above for intermunicipal agreements, an MOU should be drafted by an attorney.

H. Funding Sources

Funding sources were previously discussed in Section V. The municipality should consider applying for funding as soon as possible, since funding may or may not be available when required.

I. Reviewing/Updating the Infrastructure Master Plan

Reviewing and updating Tioga County's IMP follows a similar process as described above in Section "J" entitled Wellhead Protection Overlay Ordinance. Upon reviewing and updating the IMP, Tioga County should form a steering/advisory committee that will guide the review process and make recommendations for any changes that are identified during the review process. Professional assistance may be required to help facilitate the process and provide another layer of expertise when

reviewing the plan. The County Legislature must then review any proposed changes and adopt amendments and updates as deemed appropriate to enhance the IMP. Please note that the IMP should be reviewed on an annual basis and updated as necessary. Major updates should be made every five (5) years following its initial adoption.

Appendix A

Key Personnel

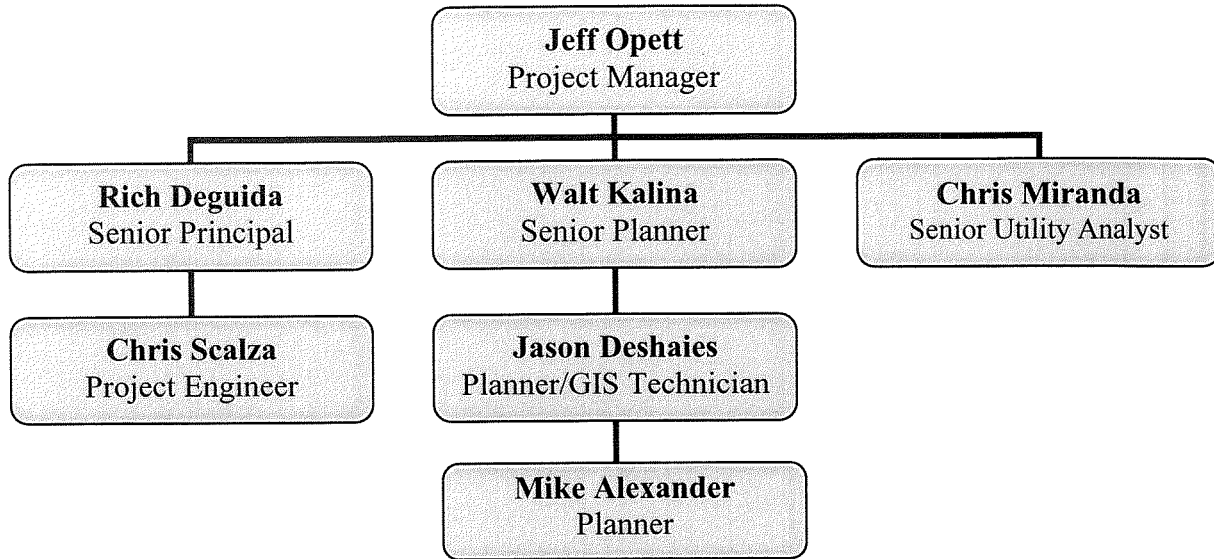
Tioga County Water and Sewer Study Steering Committee

NAME	AFFILIATION
Ron Dougherty	REAP
Mic Trivisonno	Town of Owego
Skip Hartwig	Town of Berkshire
Bill Hotchkiss	Town of Barton
Bill Caloroso	Town of Nichols
Peter Ward	Town of Candor
Jeff Barnes	Town of Tioga
Richard Harrington	Town of Richford
Mike Steck	Village of Waverly
Scot Coombs	Town/Village of Newark Valley
Dan Cafone	Town/Village of Nichols
Kevin Perry	Village of Spencer
Ron Horton	Village of Owego
Scott Mueller	RCAP
Larisa Avellaneda	REAP
Ken DelBianco	Tioga County Public Works
Doug Barton	Tioga County EDP
LeeAnn Tinney	Tioga County IDA
Elaine Jardine	Tioga County EDP

Tioga County Infrastructure Master Plan

Clough, Harbour & Associates LLP

Project Organizational Chart



Project Tasks

Jeff Opett	Project management, coordination, community interviews, and report preparation.
Rich Deguida	Coordination, water and sewer project identification, and infrastructure analysis.
Chris Scalza	Project identification, cost estimation, grant/funding opportunity research.
Walt Kalina	Project Quality Assurance/Quality Control (QA/QC).
Jason Deshaies	Geographic Information System (GIS) mapping/analysis and report preparation.
Chris Miranda	Comparative utility rate study and report preparation.
Mike Alexander	Report preparation and report review.



JEFFREY M. OPETT, P.E.
PROJECT MANAGER

Education

Syracuse University, NY/B.S. Civil
Engineering/1991

**Professional
Registration and
Activities**

P.E.-NY
American Society of Civil
Engineers

Mr. Opett currently leads our Central New York Civil Engineering and Planning Group on large and complex projects for industry, government and private clients. His experience includes all aspects of Civil Engineering from concept design through permitting and construction. Specific experience includes bridge and highway design, industrial site development, water and sewer infrastructure design and municipal planning projects. An experienced project manager, Mr. Opett has a proven track record to progress large and complex projects to successful completion

Tioga County Industrial Devel. Agency, Business Park. Project Manager responsible for the permitting, planning and design services in support of the development of a 200 acre industrial park. Specific tasks included the planning and design of the municipal infrastructure required in support of Best Buy's new 1,000,000 square foot northeast regional distribution facility. Additional tasks also included the preparation of the Environmental Impact Statement, planning and design of roads, water and sewer facilities (a 40,000 GPD wastewater treatment plant as well as potable water production and storage), extensive wetland mitigation and permitting. The project was advanced on a fast track schedule and is expected to be the cornerstone for economic development in Tioga County.

Romano Law Offices, Site Development Plan for 500 Acres. Mr. Opett provided conceptual engineering design services in support of the preliminary design of a 500 acre residential / mixed use development located in Old Forge NY. The project includes the design of water, sewer, storm and roadway improvements in support of the project. Extensive coordination with regulatory agencies including the Adirondack Park Agency was required for this project.

Ianno, Victor, Butters Farm Subdivision. Mr. Opett is the project manager for the concept planning, permitting and design of this 30 lot subdivision in the Town of Skaneateles. The scope of work includes: civil/site engineering, roadway design, water system design, stormwater management, preparation of an EIS and municipal approvals.

City of Watertown, Public Square Streetscape. Mr. Opett is project manager for the reconstruction of the Public Square area of the City of Watertown. Progressed as a federally aided, locally administered project, the scope of work includes: streetscaping, street lighting, curb and sidewalk replacement, road and utility reconstruction as well as the reconfiguration of the traffic flow in the vicinity. The project is located in a dense urban area and a great deal of public involvement and regulatory agency review was required.



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