

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

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## STUDY OVERVIEW

The communities of Tompkins County have a successful history of delivering water and sewer services to the growing demands of residential, commercial, institutional and industrial customers. Already there are many partnerships and other cooperative efforts between municipalities to provide these services efficiently in response to the changing needs of a community. Maintaining aging infrastructure and adapting facilities to comply with evolving regulatory requirements amidst uncertain economic times will continue to challenge system operators to contain costs. Further, decisions to invest additional public funds in new infrastructure to expand service areas should be guided by land use plans that have adequately considered the potential impacts of development on other local and regional services. Consistent with the principles and policies of the Tompkins County Comprehensive Plan<sup>1</sup>, an assessment of the municipal water and sewer systems from a regional perspective will prove a useful tool for communities as they develop plans for individual and inter-municipal improvements.

It was recognized in a 1994 infrastructure analysis prepared by PERC and Novelli<sup>2</sup>, as part of the Tompkins County Economic Development Strategy, that “*Municipal water and sewer services are considered essential by many of the existing manufacturing businesses in the County and by those who are engaged in the selection and marketing of potential development sites*”. Water and sewer infrastructure is essential to support investments in focused, higher density residential, institutional, commercial and industrial projects.

In 2006, an Affordable Housing Needs Assessment completed for the Tompkins County Planning Department by Economic & Policy Resources<sup>3</sup> identified an existing shortfall of affordable residential units and forecasted that the need for such housing would continue to increase into the next decade. Among other strategies, fostering higher density development in the urban core, in the County’s villages, and in new growth areas is considered an effective way to meet the housing demand. Such density will inherently rely on having reasonable access to the available capacity in municipal water and sewer systems.

Other contemporary studies, such as the Route 96 Corridor Management Study<sup>4</sup> and the NYS Route 13/366 Corridor Management Plan<sup>5</sup>, present approaches for managing possible mixed-use growth along the respective transportation corridors using nodal development strategies. Again, the presence or creation of municipal water and sewer service will be critical to implementing these new approaches.

The scope of this Study includes an inventory and technical examination of the municipal water and wastewater facilities in the urban, suburban and rural communities of the County; an evaluation of potential capacity in existing systems to support future growth in rural centers and possible development nodes; the identification of limitations to system expansion including physical factors and governance issues that may hinder a community’s access to water and sewer

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<sup>1</sup> Tompkins County Planning Department 2004. Tompkins County Comprehensive Plan, Planning for Our Future.

<sup>2</sup> PERC and Novelli & Co., 1994. Tompkins County Economic Development Strategy, Infrastructure Analysis.

<sup>3</sup> Economic & Policy Resources, Inc. 2006. Affordable Housing Needs Assessment.

<sup>4</sup> Bergman Associated and SRF Associates, 2008. Route 96 Corridor Management Study, Technical Report #1.

<sup>5</sup> Fisher Associates and Trowbridge & Wolf, 2008. NYS Route 13/366 Corridor Management Study.

service; the identification of Potential Development Focus Areas; an estimation of the potential number of new housing units in the focus areas that could access existing capacities in water and wastewater treatment facilities; a general assessment of infrastructure investments that may be necessary to support planned growth objectives, and; documentation of the stated infrastructure needs of communities without public water and sewer services.

## **STUDY APPROACH**

The examination of each community's water and sewer infrastructure relied upon the active participation of utility system operators, municipal leaders, administrators, engineers and planners. Facility tours and personal interviews were conducted by the Consultants to collect the following information:

- Current rated capacity of water and wastewater treatment systems.
- Principal treatment processes and mechanical systems.
- Scheduled or anticipated facility upgrades or new construction.
- Scheduled or anticipated water distribution or wastewater collection system upgrades or new construction.
- Historical problems and obstacles including operational difficulties, regulatory compliance, land-use restrictions, public impact or complaints.
- Current population served by the utility and the number of service connections.

The information was entered into individual interview forms and reviewed again with the municipality for accuracy and consensus. Any system limitations of a physical or regulatory nature that were revealed during the interviews are noted in the forms appended to this Study. The data retrieved from the interview process was compiled into a comprehensive matrix that reflects the status of each municipal water and sewer system as of December 2009.

The existing systems matrix became the benchmark for assessing a community's ability to meet the infrastructure demands of current and future development. It was also realized that many communities are either actively studying or actually undertaking physical improvements to enhance system capacity, operation or regulatory compliance. This dynamic introduced the element of time into the analysis of community infrastructure accessibility. After consideration of existing system conditions and pending improvement projects, rural centers and nodes considered candidates for possible development were identified. Collectively termed "Potential Development Focus Areas," the rural centers and nodes were segregated into likely periods of time during which water and sewer services could reasonably become accessible. There are many Potential Development Focus Areas requiring only customary extensions of water and/or sewer mains with some additional investment in system-wide operation and maintenance improvements that can support development needs during the next five years. The remaining Potential Development Focus Areas are expected to require significant investments in either repairs or capital improvements that could delay delivering both water and sewer service beyond five years. In these cases, the Study includes very general estimates of project costs for the expansion of municipal infrastructure that will afford the community or service area access to water and sewer systems.

Specific to the water supply and wastewater treatment facilities, the evaluation quantified the variations between permitted capacity and current use. Communities with surplus capacity in

both water and sewer facilities have a more immediate opportunity to support growth within the Potential Development Focus Areas. For the purpose of comparing the affordable housing unit demand to surplus or unused facility capacity, the volume basis of measuring capacity was converted to an estimated number of equivalent single-family homes, or Equivalent Dwelling Units (EDUs). Distribution of the EDUs had to account for the municipal ownership interests and the geographical relationships of the Potential Development Focus Areas to the treatment facilities.

## **EXISTING WATER AND SEWER INFRASTRUCTURE**

### **GENERAL**

For the purposes of this Study the term “Infrastructure” refers to water supply facilities (groundwater wells, infiltration galleries, reservoirs, and surface water intakes), water or wastewater treatment facilities, water transmission and distribution systems (pump stations, storage tanks, and pipe) and wastewater collection systems (septic tanks, pump stations, force mains, manholes and pipe).

The sixteen municipalities comprising Tompkins County include: the City of Ithaca, the Towns of Caroline, Danby, Dryden, Enfield, Groton, Ithaca, Lansing, Newfield and Ulysses and the Villages of Cayuga Heights, Dryden, Freeville, Groton, Lansing and Trumansburg. There are also a number of rural Hamlets dotting the County map. Of these municipalities the City of Ithaca, Towns of Dryden, Ithaca, Lansing and Newfield and the Villages of Cayuga Heights, Dryden, Groton, Lansing and Trumansburg have to some extent both municipal water and sewer infrastructure. The Towns of Caroline, Enfield and Groton have no municipal water or sewer infrastructure. The Town of Danby has water infrastructure in the Hamlet of West Danby and the Town of Ulysses has water infrastructure along NYS Route 96 from the Town of Ithaca line to and including the Hamlet of Jacksonville. The Village of Freeville has only sewer infrastructure. In most instances, a municipality with water and sewer infrastructure does not provide service or access to all of the properties within the incorporated boundaries or benefit districts. The extent of municipal water and sewer service areas at the time of this Study is illustrated in Appendix A.

There are seven municipal water supply and treatment facilities serving twelve municipalities. Six of these facilities are owned and operated by individual municipal entities including: the City of Ithaca, Town of Danby, Village of Dryden, Village of Groton, Town of Newfield and Village of Trumansburg. Of these six municipalities the City of Ithaca and Villages of Dryden and Trumansburg supply water to users outside of their municipal boundaries. The sixth water supply and treatment facility is the Southern Cayuga Lake Intermunicipal Water Commission (Bolton Point), which is owned and operated by five member-municipalities including: the Village of Cayuga Heights, Town of Dryden, Town of Ithaca, Town of Lansing and the Village of Lansing. This facility is by far the largest of the six facilities with a greater total permitted production capacity than the other five facilities combined. It is noted that the Town of Ulysses purchases water through the Town of Ithaca but is not a member of Bolton Point. Treated water is stored and then distributed to customers of each of the eleven municipalities through individual water distribution systems.

There are seven municipal wastewater treatment facilities that serve eleven municipalities. Six of these facilities are owned and operated by individual municipalities including the Village of Cayuga Heights, Village of Dryden, Village of Freeville, Village of Groton, Town of Newfield, and Village of Trumansburg. Of these six municipalities only the Villages of Cayuga Heights, Dryden and Freeville treat wastewater from users outside of their municipal boundaries. Portions of the Towns of Ithaca, Lansing and Dryden and the Village of Lansing contribute wastewater to the Village of Cayuga Heights Wastewater Treatment Plant but are not owners of that facility. Discharges to this plant are approved by the Village of Cayuga Heights on a project-by-project basis through the purchase of sewer units. The seventh wastewater treatment facility is the Ithaca Area Wastewater Treatment Facility (IAWTF), which is owned and operated by three municipalities including: the City of Ithaca, Town of Ithaca and Town of Dryden. The IAWTF is the largest of the seven facilities with a greater total permitted treatment capacity than the other six facilities combined. The individual municipalities own and operate their own wastewater collection systems.

Table 1 summarizes the numerous inter-municipal relationships that currently exist to share water supply and wastewater treatment facilities.

Water Supply and Treatment Facility	Municipalities Served	Joint Agreements and Shared Facilities
Town of Danby	West Danby Water District	None
Village of Dryden	Village of Dryden, Town of Dryden Areas (Serves TC3, Dryden Middle and High Schools, and North Street north of Lee Road)	None
Village of Groton	Village of Groton	None
Town of Newfield	Town of Newfield Water Districts (#1, # 2 and the Frandsen Extension)	Water Districts #2 and the Frandsen Extension have purchase agreements with Water District #1.
Village of Trumansburg	Village of Trumansburg, Town of Ulysses Water Districts (#1 & #2 adjacent to Village), Commercial area on Seneca Road in Seneca County	None
Southern Cayuga Lake Intermunicipal Water Commission (SCLIWC)	SCLIWC members: Town of Ithaca (Serves Ithaca College), Village of Lansing, Village of Cayuga Heights, Town of Lansing Water Districts, Town of Dryden Water Districts (6 Water Districts bordering the Town of Ithaca), Town of Ulysses (Water Districts #3 & #4), City of Ithaca (Limited Area of Oakwood Lane, Hector Street, Warren Place, Sunrise Road and Richards Place)	SCLIWC members own the Bolton Point Treatment Facility, the Transmission Main, and three storage tanks: Burdick Hill Tank, the Sheldon Road Tank and the East Hill Tank.
Cornell University	Cornell University Campus, City of Ithaca (Serves a Limited Area of Cornell Heights), Town of Ithaca (Serves a Limited Area of Forest Home on the south Side of Fall Creek)	None
City of Ithaca	City of Ithaca (Except Small Areas Noted Above), Town of Ithaca (Along East Shore Drive, Renwick Heights, and Taughannock Boulevard)	None
Wastewater Treatment Facility	Municipalities Served	Joint Agreements and Shared Facilities
Village of Cayuga Heights	Village of Cayuga Heights, Village of Lansing (A Portion), Town of Dryden (SD # 1), Town of Ithaca (Warren and Hanshaw Road Area), Town of Lansing (Small Area)	Intermunicipal agreements control access to the VCHWTP. The Kline Road by-pass takes sewage that would normally be treated at VCHWTP to the IAWTF.
Village of Dryden	Village of Dryden, Town of Dryden (Cortland Road SD)	Shares a common outfall to Fall creek with the Village of Freeville.
Village of Freeville	Village of Freeville, William George Agency for Children's Services	Shares a common outfall to Fall creek with the Village of Dryden.
Village of Groton	Village of Groton	None
Town of Newfield	Hamlet of Newfield	None
Village of Trumansburg	Village of Trumansburg	None
Ithaca Area Wastewater Treatment Facility	Joint Owners: City of Ithaca (Including Cornell University Campus), Town of Ithaca (Including Cornell University Campus), Town of Dryden (5 Sewer Districts), Also some flow from Kline Road by-pass	Ownership: City of Ithaca 56%, Town of Ithaca 42%, Town of Dryden 2%. Multiple agreements for joint ownership of interceptor sewers between the City of Ithaca/Town of Ithaca as well as The Town of Dryden/Cornell University.

Table 1 – Intermunicipal Water Supply and Wastewater Treatment Summary

The following descriptions of water and sewer infrastructure in each municipality were generated from personal interviews conducted with utility system operators, municipal leaders, administrators, engineers and planners. The complete collection of municipal infrastructure interview forms can be found in Appendix B.

## **CITY OF ITHACA**

### ***Water***

The source of supply for the City system is Six Mile Creek. The Sixty-Foot Reservoir (also known as the Potters Falls Reservoir) has a reported safe yield of at least 5.4 MGD. The existing water treatment plant at Water Street has a capacity rating of 7.0 MGD. The current process includes chemical coagulation, flocculation, sedimentation, filtration and disinfection. Recent planning and detailed environmental examination of water supply options has been concluded and the selected alternative is to replace the existing plant with a membrane filtration plant capable of producing 4.0-6.0 MGD. The anticipated full scale membrane plant design will include complete coagulation, multi-stage flocculation and high rate clarification. The membrane technology will be either microfiltration or ultrafiltration. Disinfection will follow this new treatment process.

Most of the water produced by the existing treatment plant is distributed by gravity from the two clearwell storage reservoirs at the facility site. The combined capacity of the clearwells is 1.43 MG. The Elm Street tank at the western limit of the City's gravity zone is a companion tank to the clearwells and has a storage volume of 1.5 MG. Two pumps at the plant draw water directly from the clearwells and discharge into higher tank zones. The 'Mitchell Street' pump station fills the Cornell Street (1.0 MG) and Coddington Road (1.0 MG) tanks. The 'East Ithaca' pump station fills the Maple Avenue (0.615 MG) tank. The third pump station at Vinegar Hill pumps water from the gravity zone into the Oakwood Lane (0.75 MG) tank and the Cliff Park (0.15 MG) tank. In total, there is a gross storage volume of over 6.4 MG in the City system. Given the loss of demand by Town of Ithaca customers in the Inlet Valley and West Hill areas, the City has temporarily drained the Elm Street tank until average daily consumption within the balance of the gravity zone increases and causes a satisfactory turnover of water in the tank. The transmission and distribution mains in the gravity system are relatively well looped. Larger diameter mains generally run north/south along the primary City streets with smaller mains running east/west. That portion of the City distribution system north of Fall Creek in the Cornell Heights neighborhood is presently served by Cornell University. Following the completion of the City's treatment plant upgrades and improvement in distribution system water quality, service to the neighborhood from the City system will likely be restored.

### ***Sewer***

Refer to the section titled "Ithaca Area Wastewater Treatment Facility" for a discussion of the City's ownership interest and operational roles in the treatment plant and jointly owned interceptor sewers.

## VILLAGE OF CAYUGA HEIGHTS

### **Water**

The Village of Cayuga Heights provides water service throughout the Village via the Sheldon Road tank operated by Bolton Point. The Sheldon Road Tank is a 500,000-gallon welded steel tank that was rehabilitated in 2007. The Sheldon Road Tank service area is bound on the east by Triphammer Road (south of Upland Road) and The Parkway and Highgate Road (north of Upland Road). It extends to the north and south Village boundaries and west to Remington Road.

Prior to 2006 the piping network was comprised of three distinct zones. A large diameter main running in an east-west direction along the Upland Road corridor; a network south of the Upland Road corridor comprised of medium to small diameter pipes; and a network north of the Upland Road corridor consisting of small diameter pipes. In 2007 the Village completed Phase 1 of a water system improvement project south of Upland Road. This phase included the installation of 8-inch piping on Cayuga Park Circle, 10-inch piping on Kline Road and several hydrants. In 2009 the Village completed Phase 2 of the water system improvement project north of Upland Road. This phase included the installation of 8-inch piping on Highgate Road and Highgate Place, 10-inch piping on Cayuga Heights Road, Highgate Road, Remington Road and The Parkway and several hydrants. These improvements resulted in improved fire flows throughout the Village.

### **Sewer**

The wastewater treatment plant for the Village of Cayuga Heights is a trickling filter plant with tertiary phosphorus removal, which treats flow from the Village of Cayuga Heights, part of the Town of Ithaca, parts of the Village and Town of Lansing and the Town of Dryden. The 2.0 million gallons per day (mgd) capacity of the wastewater treatment plant at the Village of Cayuga Heights and the permitted flows allowed by the New York State Department of Environment and Conservation (NYSDEC) allow some additional wastewater to be treated without any major upgrades. The plant has recently been upgraded to improve the Phosphorus removal capability and it is currently operating within the limits set by the New York State Discharge Permit.

The wastewater collection system is a gravity system and has no identified deficiencies that would preclude additional flow. Currently, between 0.10 and 0.20 MGD of sewage is diverted out of the Villages collection system and directed to the IAWTF via the Kline Road diversion. If the diverted flow is ever re-directed to the Village of Cayuga Heights Wastewater Treatment Plant (VCHWTP) the surplus capacity at the plant will be reduced.

### **Identified Physical Factors and Governance Issues Limiting System Expansion**

- There is capacity within the existing wastewater treatment plant to accept additional flow. If additional capacity were required over and above the current permit limit of 2 mgd upgrades would be required to the final settling tanks. Due to site limitations a new tank may need to be constructed over the existing access road and a new access to the site constructed.

## **TOWN OF CAROLINE**

### ***Water***

Landowners throughout the Town, including the rural Hamlets of Slaterville Springs and Brooktondale rely upon private water supplies and on-site sewage disposal systems. Although there have not been formal requests to pursue the creation of municipally owned and operated water and sewer systems in these hamlets, it is not beyond possibility that at least public water systems could be an important service in the future.

In Slaterville Springs, recent documentation of the shallow artesian aquifer condition beneath Six Mile Creek raises concerns for those existing properties tapped into this source. As experienced with the Buffalo Road bridge reconstruction in 1993, the integrity of the confining overburden soils can be jeopardized and once breached, leaves many adjacent residents without their artesian water supply.

In Brooktondale, anecdotal evidence suggests there are multiple occasions of neighbors sharing a common groundwater supply and plumbing. Often, the water source is a spring located on the adjacent hillside. Further, the separation distances between individual onsite wastewater treatment systems and adjacent water supplies are reduced by the housing density inherent of the hamlet. If the decline in quality and quantity of the existing individual sources affects enough landowners in the future, a small rural water system comparable to the West Danby Water District may be an appropriate municipal solution.

### ***Sewer***

The Town of Caroline does not have a municipal sewer system.

## **TOWN OF DANBY**

### ***Water***

The Town of Danby currently has one water district that serves the Hamlet of West Danby. This district is served by a single drilled well at the Sylvan Lane pump station and can pump 100 gpm. Groundwater quality is good and the water is treated with liquid chlorine for disinfection. Water quality and levels have remained consistent over the last 40 years.

The distribution system is a combination of 8-, 6- and 3-inch pipe and includes only three fire hydrants. The well pumps water to a 50,000 gallon welded steel tank, which is more than adequate for the domestic demand but offers limited fire flow duration.

The Hamlet of Danby does not presently have municipal water service; however, Town officials have expressed interest in understanding the pros and cons of creating a small, rural water system within the hamlet utilizing a groundwater source or extending the Bolton Point supply from the Town of Ithaca. With respect to the availability of a local groundwater source, an investigation of the valley-fill aquifer in the Upper Buttermilk Creek/Danby Creek valleys by the United States Geological Survey is currently in process. The objective of the study is to improve the understanding of the geohydrology of the valley-fill deposits. The information provided will be useful when considering the aquifer as a potential municipal source of supply.

## **Sewer**

The Town of Danby does not have a municipal sewer system.

### **Identified Physical Factors and Governance Issues Limiting System Expansion**

- Water capacity to provide for additional use is limited by not having enough pumping capacity to provide for the peak day demands with the “best” well out of service. This condition, combined with the lack of storage for fire flow, will create restrictions for development outside the current district.

## **TOWN OF DRYDEN**

### **Water**

The majority of the Town of Dryden is served by private wells. The areas that receive municipal water are served from either the Village of Dryden or Bolton Point. Properties north of the Village of Dryden (including the Dryden High School/Middle School (Dryden HS/MS), Tompkins Cortland Community College (TC3) and properties north of Lee Road) receive water from the Village of Dryden.

The western boundary of the Town of Dryden includes 6 water districts that receive water through Bolton Point. Water District No. 1 serves the Varna area and is supplied by a 500,000-gallon tank located on Sapsucker Woods Road and operated by the Town of Ithaca. The Snyder Hill Water District serves properties along Snyder Hill Road and Peregrine Way and is supplied water from a 500,000-gallon Town of Ithaca tank located on Hungerford Hill Road. A booster-pump station increases main pressure for domestic demands in this district but cannot provide fire flow.

The remaining four water districts are served by two Town of Dryden tanks located on the New York State Electric & Gas (NYSEG) property, which have capacities of 200,000 and 400,000 gallons. The NYSEG tanks are filled through the Varna Pump Station at the east end of Water District No. 1.

The Monkey Run Water District serves properties on Rte 366 north of Varna, Barr Road and Abbott Road. The Hall Road Water District serves the Vanguard property adjacent to Rte 13. The Turkey Hill Water District serves properties on Rte 366, Mount Pleasant Road, Turkey Hill Road, Observatory Circle, Forest Lane and Monkey Run Road. The Royal Road Water District serves 6 commercial properties on Royal Road.

The NYSEG tanks and the distribution systems are in generally good condition and both NYSEG tanks have been inspected in the past year.

### **Sewer**

The majority of the Town parcels are served with individual onsite wastewater treatment systems. The areas that are served by municipal sewer discharge to one of three wastewater treatment facilities: the VCHWTP, the IAWTF or the Village of Dryden plant. The Town of Dryden currently has 7 sewer districts.

Sewer District No. 1 serves Meadowlark Road, Cardinal Drive and properties on the east side of Sapsucker Woods Road and runs by gravity to the Town of Ithaca system. Flows then travel through the Town of Ithaca and Village of Cayuga Heights collection systems to the VCHWTP.

Sewer District No. 2 serves the Varna area and runs by gravity to the Varna Pump Station, which lifts sewage to the joint Cornell/Dryden transmission main on NYS Route 366. Flows then travel through the Cornell and City of Ithaca collection systems to the IAWTP. Agreements currently exist between the Town and Cornell for apportioning of capacity in the joint transmission main and any upgrades to the Varna Pump Station and Force Main. This district also has a small pump station, which serves Freese Road south of Fall Creek and pumps to the gravity main on NYS Route 366.

The Snyder Hill Sewer District serves properties in the Peregrine Subdivision and runs by gravity to the Town of Ithaca system. Flows then travel through the Town and City of Ithaca collection systems to the IAWTP. This system will require the installation of a flow meter at the Town of Ithaca line if the district is enlarged.

The Monkey Run Sewer District serves properties on Route 366 north of Varna, Barr Road and Abbott Road. The Monkey Run Road area runs by gravity to the Sewer District No. 2 gravity system and the Varna Pump Station. The Hanshaw Road (Armory) area runs by gravity to the Lower Creek Road Pump Station then is pumped through a force main to the Monkey Run gravity system on Route 366.

The Turkey Hill Sewer District serves properties on Route 366, Mount Pleasant Road, Turkey Hill Road, Observatory Circle, Forest Lane and Monkey Run Road. The district runs by gravity to the Monkey Run gravity system.

The Royal Road Sewer District serves 6 commercial properties on Royal Road. The distribution system includes a force main and individual pump stations. The force main connects to the Monkey Run gravity system that flows to the Lower Creek Road pump station.

The Cortland Road Sewer District serves the area of the Town north of the Village of Dryden including TC3, Dryden HS/MS and the commercial properties along North Road. Sewage flows by gravity to the Village of Dryden and is treated at the Village of Dryden Wastewater Treatment Plant (VDWTP). This district also has a small pump station, which serves part of Mott Road and pumps to the gravity near the intersection of North Road.

The Vanguard property adjacent to Route 13 is an out-of-district user. This property gravity feeds to its own pump station then sends sewage through a force main across Route 13 to the Monkey Run Sewer District.

Approximately 4-6 properties along Sapsucker Woods Road are served as out-of district users by the Town of Ithaca. A force main pumps sewage to the Town of Ithaca system.

#### ***Identified Physical Factors and Governance Issues Limiting System Expansion***

- The Town is investigating the creation of a new Cortland Road Water District to serve

the area of town north of the Village of Dryden. However, this area of the Town would need to get water from the Village of Dryden or install its own water supply. The Village of Dryden water system is unsuitable for supplying water outside the Village boundaries at this time. The Town is working with the Village to explore inter-municipal solutions to the Village water supply limitations.

- Any future extensions to the Monkey Run, Hall Road, Turkey Hill Road and Royal Road districts that rely on capacity from the NYSEG tanks may require the construction of an additional tank in order to provide additional storage for fire flow.
- Extensions of the Snyder Hill Water District would provide domestic water only. The lack of pressure in that area does not allow for the system to provide fire flow to the area.
- Expansion of the Town's Sewer District No. 1 will require an inter-municipal agreement with the VCHWTP to access additional sewer capacity.
- Any sewer extensions that will exceed the pumping capacity of the Varna Pump Station will require upgrades to the station as well as possible upsizing of the Cornell/Dryden Transmission main. These improvements will require the approval of Cornell University and new agreements will need to be drafted.

## **VILLAGE OF DRYDEN**

### ***Water***

In 2009 the Village hired the MRB Group of Rochester New York to prepare an Engineer's Report to evaluate the existing water system. This report was completed in January 2010 and investigated drilling a new well(s), repairing or replacing both the Lee Road and Ferguson Road storage tanks, replacing undersized mains, and other improvements.

The Village of Dryden operates 4-drilled wells at three sites within the Village. The South Street well, approved for 100-gallons per minute (gpm) but pumping at 120-gpm, provides nearly 60% of the Village's needs, with the well at Jay Street providing the other 40%. Jay Street is permitted for up to three wells and 150-gpm, but the expected yield has never materialized and only one well is used at 80-gpm. Two wells on Lake Road provide only 1% of the water because the iron and manganese content affects the quality. Treatment for iron removal would allow greater use since the wells have pumps for 80- and 85-gpm and are permitted for over 100-gpm each. All the wells are treated with gas chlorine for disinfection and a chemical is added to help prevent iron from precipitating. All wells pump directly into the distribution system.

Two water storage tanks store over three days of average daily use. The 500,000-gallon Lee Road reservoir is in marginal condition. It was built in the early 1890s as an open reservoir then, in the 1970s, a metal building was erected over it. The 300,000-gallon concrete Ferguson Road tank was originally at ground level, but is now covered with earth to protect the concrete.

The Village distribution system is generally in good condition with many mains updated in recent years. The water distribution system provides water to the Village, but service also

extends outside the Village into the Town of Dryden in three areas. These areas include the TC3 campus, the Dryden MS/HS and a commercial area off Lee Road. The major user is TC3, which is on its own pressure system and is served by pumps and a 350,000-gallon storage tank owned by the college. The Dryden MS/HS are served directly by the Village system. A small area of the Town of Dryden north of Lee Road and east of NYS Route 13 is provided water through an old 1-1/2" main that is in poor condition. The Village has been maintaining this line but may discontinue this service with appropriate notice to the affected users.

### **Sewer**

The existing 400,000-gpd wastewater treatment plant serving the Village and parts of the Town of Dryden will be upgraded in 2010 and 2011. The main driver behind the new plant is a new lower phosphorus limit. The new plant will be based on the Sequencing Batch Reactor (SBR) process and will produce a better quality effluent than that which is being discharged currently. It is expected that the new plant will be operational by the middle of 2011. The new plant will have a capacity of 600,000-gpd after construction.

The collection system is mainly gravity. There is one pump station in the Village that serves 6 dwellings. There are no known issues within the wastewater collection system that will preclude flow to the plant up to the new plant's capacity.

### **Identified Physical Factors and Governance Issues Limiting System Expansion**

- Water capacity to provide for additional use is limited by not having enough pumping capacity to provide for the peak day demands with the "best" well out of service. A small number of new units can be accommodated by the system, but a large project or a water main extension would likely require a detailed review to determine if the capacity is sufficient.
- Extension of water mains outside the Village can only be done by the creation of a Town Water District. An additional well(s) is needed to increase the ability to provide for peak flows with one well out of service. The major difficulty lies in finding a place to drill a well that has satisfactory yield and quality. A new well will likely need to be located outside the Village. An area of the Village off Ferguson Road near the Ferguson Road tank could be developed if a pump station was constructed near the tank to create another pressure zone.
- The Elm Street sewer main is undersized and would need to be increased if flows from outside the Village were allowed to connect to it.

## **TOWN OF ENFIELD**

### **Water**

Landowners throughout the Town rely upon private water supplies and individual on-site wastewater treatment systems. While there has not been a documented need or public request for municipal water and sewer services there are existing patterns of development that may in the future benefit from the creation of a small rural water system or extension of neighboring municipal water system. Municipal officials interviewed recall that a feasibility study for

extending municipal water from the Town of Ithaca had been prepared in the past. Specific to Enfield Center, the separation distances between individual onsite wastewater treatment systems and adjacent water supplies are reduced by the housing density inherent of the hamlet. In a recent circumstance, the Enfield Center Baptist Church at 174 Enfield Main Road has relocated to a different building given the lack of available land for a sewage disposal system. If a decline in individual water source quality affects enough landowners in the future, a small rural water system could be considered. If a groundwater source were to be pursued it would be necessary to better understand the extent and capacity of the Enfield Creek valley aquifer. According to the USGS<sup>6</sup> an undifferentiated sand and gravel aquifer exists north and south of the hamlet.

### ***Sewer***

The Town of Enfield does not have a municipal sewer system.

## **VILLAGE OF FREEVILLE**

### ***Water***

The Village of Freeville has no municipal water infrastructure.

### ***Sewer***

The Village of Freeville's 125,000-gpd wastewater treatment facility serves most of the Village of Freeville and the William George Agency for Children's Services (WGAFCS) in the Town of Dryden which is an out-of-district user. The Village's facility consists of two aerated lagoons, which operate in series. The effluent from the plant is chlorinated with sodium hypochlorite and then discharged to the outfall (shared with the Village of Dryden) to Fall Creek about 2 ½ miles away. There is some additional capacity in the existing plant.

The Wastewater collection system contains 11 pumping stations, which transport the flow from the Village. All sewage from the WGAFCS flows by gravity to the plant.

### ***Identified Physical Factors and Governance Issues Limiting System Expansion***

- There are no known limitations in the system that would prevent expansion of the sewer system. However, expansion of the system outside of the Village would require the creation of a Town sewer district.

## **TOWN OF GROTON**

### ***Water***

The Town of Groton has no municipal water infrastructure.

### ***Sewer***

The Town of Groton does not have a municipal sewer system.

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<sup>6</sup> Miller, T.S., 2000. Unconsolidated Aquifers in Tompkins County, New York.

## VILLAGE OF GROTON

### *Water*

The water service area in the Village of Groton is currently restricted to the Village but also serves approximately 15 out-of-district users located in the Town of Groton. The Village regularly uses two sources of water; the Morton Works Facility and the Conger wells. The Morton Works, a series of infiltration galleries collecting shallow ground water outside the Village along Old Stage Road, is used to the maximum extent. Reliable flow is about 100-gpm but often 140-gpm or more is available, depending on rainfall and ground water level.

Water flows by gravity to a microfiltration and hypo chlorination treatment plant on Clark Street, and then to the Clark Street water tank, which provides pressure to the majority of the Village. Nitrate in the Morton Works water is approximately 5 mg/l, which is half of the maximum contamination level, so it is monitored quarterly. Nitrate is not affected by the microfiltration treatment process. Three drilled wells are located on Conger Boulevard, but only the two larger ones, fitted with 250 gpm pumps each, are currently used. Some days these pumps do not run because the Morton Works supplies all the water needed. These wells pump directly into the distribution system after being treated with gas chlorine for disinfection. A chemical is also added to help prevent iron from precipitating.

A 500,000 gallon tank on Clark Street serves the majority of the Village and a 200,000 gallon storage tank on Elm Street serves a higher pressure zone for the east side of the Village. The Elm Street tank is fed from a pump station at Clark Street. Both the 500,000-gallon Clark Street tank and the Elm Street water storage tanks are in good condition. The water flows by gravity from the Morton Works to the Clark Street tank through a meter and overflows the tank when demand is less than the flow. This condition results in wasted measured water and inflated reported average and maximum day water flows.

The distribution system is generally considered in good condition. Some older smaller mains could be replaced that would improve distribution.

### *Sewer*

The existing 350,000-gpd wastewater treatment plant serving the Village of Groton is an extended aeration activated sludge plant. It is about to be upgraded to a Sequencing Batch Reactor (SBR) plant with a capacity of 500,000-gpd. The expected date when the upgraded plant will be operational is spring 2011.

The plant upgrade is being carried out due to a new limit on the phosphorus in the discharge permit and to increase the flow capacity in the plant. The upgraded plant will have excess flow capacity when the upgrade is complete.

The existing wastewater collection system in the Village of Groton consists of gravity sewers (i.e., no wastewater pumping stations) and is around 40 years old. There were no major issues reported by the Village other than issues due to the age of the system.

**Identified Physical Factors and Governance Issues Limiting System Expansion**

- Current meter readings indicate the water supply does not have enough pumping capacity to provide for the peak day demands with the “best” well out of service. However, water capacity to provide for additional use is not as limited as the calculations indicate because of the wasted measured water noted above.
- Extension of water mains outside the Village could only be done by the creation of a Town Water District or annexation of additional land to the Village.

**TOWN OF ITHACA****Water**

The Town of Ithaca is a single, town-wide water district; however, not all lands in the Town presently have access to municipal water. The majority of Town customers are supplied treated water from Bolton Point. Lakeshore properties along East Shore Drive and Taughannock Boulevard, together with the Renwick Heights neighborhood and several properties on Trumansburg Road near the City boundary, are supplied treated water from the City of Ithaca.

There are eleven Town owned water storage tanks with a combined volume over 4.75 million gallons. The 18-inch and 16-inch diameter transmission mains owned and operated by Bolton Point stretch from the Burdick Hill Storage Tank in the Town of Lansing to the Pearsall Place pump station on South Hill. Town owned transmission mains extend from South Hill through the Inlet Valley to West Hill which link the Town’s storage tanks and distribution systems in those areas to the Bolton Point supply. The Town of Ulysses’ water system is supplied by Bolton Point water through the Town of Ithaca’s Woolf Lane pump station. The 200,000-gallon Town of Ulysses storage tank on Van Dorns Corners Road provides domestic and fire water storage for Town of Ithaca customers in the vicinity of Trumansburg Road and Iradell Road.

Ithaca College is connected to the Town’s Danby Road tank zone and pumps Bolton Point water to their independently owned and operated 500,000-gallon storage tank and campus distribution system.

On East Hill, the Town’s 500,000-gallon Hungerford Hill tank zone supplies water to the Town of Dryden Snyder Hill Water District. The 200,000-gallon Pine Tree Road tank zone currently serves the Cornell University properties along Pine Tree Road including the East Hill Plaza.

In the Northeast area, that portion of the Cornell Business and Technology Park in the Village of Lansing and south of NYS Route 13 is connected to the Town’s 500,000-gallon Sapsucker Woods tank zone. This tank zone is also the source of supply for the Town of Dryden Water District No. 1 (Varna area).

The distribution main on Danby Road in the South Hill area is 6-inch diameter between West King Road and the Ithacare Facility and is not looped. The small diameter main limits available fire flow along this stretch of Danby Road. The Town is planning to replace the main with at least an 8-inch pipe. Also, in the South Hill area, there are low static and residual pressures in the Southwoods Subdivision on East King Road, which is served by the 150,000 gallon Troy

Road tank zone. Available fire flow within the development is limited. The Town is presently evaluating what system improvements to implement to enhance fire protection.

The Pine Tree Road tank zone includes a length of 6-inch diameter pipe between Snyder Hill Road and Ellis Hollow Road that limits the available fire flow to the commercial and high-density residential properties surrounding the East Hill Plaza. The recent construction of the Bolton Point 1.0 MG East Hill Tank on Hungerford Hill affords an opportunity to create a new higher- pressure zone for these customers and should be considered for any subsequent developments.

The Distribution main on East Shore drive is an old 6-inch cast iron pipe and is a dead-end main. The small diameter line and the lack of a looped system limit fire flow and the fragility of the old pipe limits the amount of pressure and hydraulic surges that the pipe can handle. Because of the limitations of the pipe, the Town is currently supplying the area from the City of Ithaca gravity system. The Town has prepared plans to replace the water main with a 12-inch pipe which will allow the main to be connected to the Remington Road water main which is supplied from the Village of Cayuga Heights distribution system which is part of the Bolton Point system. This will provide adequate pressure and fire flow. The 12-inch main has been sized to provide for future supply needs if it is extended to the Bolton Point water plant in the future.

### **Sewer**

The Town of Ithaca is a single, town-wide sewer district; however, not all lands in the Town presently have access to municipal sewer. There are six distinct geographic service areas.

The West Hill collection system serves properties on and adjacent to Trumansburg Road, Mecklenburg Road, West Haven Road and Elm Street. The sewer mains along these highway corridors connect to jointly owned interceptor pipes in the City. The three interceptors converge near the Buffalo Street Bridge at the Flood Relief Channel. A combination of gravity and low-pressure (siphon) piping convey flow over and under the Channel, respectively. Lakefront parcels along Taughannock Boulevard, from the City boundary to the Town of Ulysses' border, are also served by a Town sewer main. The Taughannock Boulevard main connects to a jointly owned interceptor pipe and pump station in Cass Park. A force main from the pump station extends beneath the Cayuga Inlet to Pier Road.

The Inlet Valley system extends from a jointly owned interceptor on Floral Avenue and serves parcels along Five Mile Drive, Elmira Road and NYS Route 327. A siphon beneath the Flood Relief Channel discharges to a pump station in the Cherry Street industrial park. There are no known capacity issues in the collection mains and siphon.

Sewer mains throughout the South Hill neighborhoods converge at jointly owned interceptors in the City of Ithaca on Aurora Street, Hudson Street and Crescent Place. The Danby Road corridor serves the majority of the Ithaca College facilities, the South Hill Business Campus and the commercial uses in the vicinity of the West King Road intersection. Pipe capacities are reportedly adequate for present and future discharges. Customary replacement of aging pipe is currently being considered. The collection system along Coddington Road serves a limited number of residential customers between the City of Ithaca boundary and West Northview Road.

Therm, Inc. and the residential neighborhoods in the vicinity of Pennsylvania Avenue, Northview Road, Troy Road and East King Road (Southwoods and Deer Run developments) connect to the interceptor at Crescent Place.

The East Hill system includes extensions of jointly owned interceptors on East State Street/Slaterville Road from the City of Ithaca boundary to Burns Road and on Mitchell Street from the City of Ithaca boundary to Summerhill Lane. Collection pipes serving residential and institutional uses on Pine Tree Road, Honness Lane, Snyder Hill Road and the Eastern Heights neighborhood connect to the Slaterville Road interceptor. Commercial and high-density residential properties surrounding the East Hill Plaza discharge through the Mitchell Street interceptor.

The Northeast system basically includes the Town's sewer infrastructure in the vicinity of the Warren Road and Hanshaw Road corridors north of the Cornell University Campus. Sewage from the residential and institutional properties is ultimately discharged into the Village of Cayuga Heights collection system and treated at the VCHWTP.

The Lake Street system includes gravity collection mains along Lake Street and throughout the Renwick Heights neighborhood, which extend from an interceptor sewer jointly owned by the City and Town of Ithaca at the Ithaca High School. The East Shore Drive properties, including a few City parcels adjacent to Stewart Park, drain to a pump station jointly owned by the City and Town of Ithaca, which lifts sewage to the Lake Street main.

#### ***Identified Physical Factors and Governance Issues Limiting System Expansion***

- There are occasional wet weather sewer capacity problems with the jointly owned interceptor mains that serve the West Hill and East Hill collection systems. The existing siphon under the Flood Control Channel at Buffalo Street, which serves the Town's collection systems on Trumansburg Road and Elm Street, is flow limited when high rates of infiltration and inflow surcharge the interceptor pipes on Inlet Island. Construction of a new interceptor in the Town connecting the mains on Trumansburg Road and Taughannock Boulevard to a new pump station and force main opposite Third Street Extension is a possible long-term solution being considered.
- On East Hill, segments of jointly owned sewer interceptors within the City on East State Street and below Valentine Place can be flow limited when high rates of inflow and infiltration exceed pipe capacities. While the City and Town are aware of the conditions there are no immediate plans to replace or augment the capacity of the existing pipes.
- The sewer interceptors jointly owned by the City and Town of Ithaca have capacity and ownership stipulations that can affect access to plant capacity.
- Watermains in limited areas of South Hill and East Hill are undersized (6") and restrict fire flows.

## **TOWN OF LANSING**

### ***Water***

The Town of Lansing contains a contiguous distribution system, which includes 4 water storage tanks that feed more than 10 individual pressure zones. Two additional isolated extensions from adjacent neighboring municipalities (Town of Ithaca and Village of Lansing) exist along East Shore Drive. There are also two booster station systems that serve a limited number of residential connections where gravity distribution is presently not available at higher ground elevations. The Town has previously combined individual districts to form a single benefit area known as the Consolidated Water District (CWD). There have been 2 recent extensions of the CWD on Lansing Station Road and Drake Road.

The 1.0 million gallon Village Circle Tank and the 350,000 gallon Bean Hill Tank combine to serve the area of South Lansing and are supplied by the Burdick Hill Pump Station which has a direct connection to the Bolton Point transmission system. The distribution piping is at least 8-inch diameter throughout that portion of the area served by these tanks. The pipe network is fairly well looped between Cherry Road, North Triphammer Road, Peruville Road and Warren Road.

The 200,000-gallon Wilson Road Tank is supplied by the Village Circle/Bean Hill grid and provides service to the Lansing Central School District and surrounding residential neighborhoods in Ludlowville and Myers Park.

The 250,000-gallon Emmons Road Tank is supplied by the Pine Grove Pump Station in Ludlowville and provides volume and pressure for lands between Ludlowville Road and Milliken Station Road along the Ridge Road (NYS Route 34) corridor.

### ***Sewer***

Only a small benefit district in the south end of the Town, known as the Cherry Road Sewer District, currently has sewer service. The Borg-Warner plant on Warren Road and residential subdivisions on Horizon Drive are connected with 8-inch mains to the Village of Lansing collection system on Bush Lane.

The Warren Road Sewer District was recently formed to facilitate extending sewer service to institutional, commercial and multifamily properties along Cherry Road, Warren Road, Dutch Mill Road and Farrell Road. Construction will begin in 2010. The new main will connect to the existing Town system on Horizon Drive and convey sewage to the VCHWTP via the Village of Lansing collection and transmission system.

### ***The South Lansing Sewer District***

In 1996 the Town sponsored a community-based planning process to evaluate sewage disposal options in the area of the South Lansing hamlet. At the conclusion of the planning effort, a draft Wastewater Facilities Plan was presented to the Town. The final Plan, adopted in 1998, documented the need and presented alternatives for improving wastewater treatment within a planning area encompassing roughly 10 square miles between the Village of Lansing on the south and the Tompkins County Agricultural District No.1 on the north. Multiple disposal

solutions were considered, including a Town-owned wastewater treatment plant, utilizing existing regional treatment facilities, and treatment in localized sub-areas. Following completion of the Plan, interest grew among neighboring municipalities to find inter-municipal solutions to a broad array of individual wastewater problems. Over the next six years, the Town participated in numerous planning and negotiation sessions with the Towns of Dryden and Ithaca; the Villages of Cayuga Heights and Lansing; and the City of Ithaca. Together, these municipalities conducted an environmental review of the potential impacts associated with the expansion of sewer service areas that would be made possible through sharing of existing regional wastewater facilities. Upon conclusion of the environmental review process these participating municipalities adopted the Intermunicipal Wastewater Agreement, which endorsed the collective utilization of the VCHWTP and IAWTF to provide efficient sewage treatment for the respective municipalities, including that portion of the Town located in the planning area. In 2004 the Town authorized the preparation of a map, plan and report for the establishment of the South Lansing Sewer District. The proposed improvements included over 182,000 feet of gravity and force main piping and several high head pump stations to connect customers in the Town's service area to the VCHWTP. Following considerable public input, which focused largely on the high project cost (\$29,130,000), the Town Board in August 2007 tabled the establishment of the South Lansing Sewer District.

In the near future, the Town may assess the feasibility of forming a reduced service area around the South Lansing hamlet. The area could include the NYS Route 34/34B corridor from N. Triphammer Road to Myers Road, Myers Road and Ladoga Park neighborhoods. In addition to the residential uses immediately adjacent to the corridor, the larger benefitted properties would include the Town of Lansing, New York State Office of Children & Family Services (NYSOCFS) campus, the Lansing Central School District, Cargill and Woodsedge Apartments. A Town-owned wastewater treatment plant having a maximum discharge of 0.5 MGD would be constructed at a location proximate to the Cayuga Lake shoreline. The plant would include an outfall into Cayuga Lake.

#### ***Identified Physical Factors and Governance Issues Limiting System Expansion***

- The higher ground elevations in the vicinity of the Bean Hill Tank (Grandview Drive) and Village Circle Tank (east of Warren Road) result in lower water supply pressure for adjacent customers. Municipal or individual booster pumps have been needed to augment service. The creation of a higher-pressure zone along the Town's east boundary has been considered.
- Capacity in the Burdick Hill Pump Station will have to be increased as more connections within the Consolidated Water District are added. Utilizing the Bolton Point Burdick Hill Tank for supplying more of the Town's pressure zones will reduce demand and electrical consumption at the Burdick Hill Pump Station. New piping must be installed in the vicinity of Drake Road and Atwater Road to facilitate this improvement.
- Since there is no sewer system in the Village of Lansing west of N. Triphammer Road and north of Oakcrest Road, further extensions of collection mains in the south end of the Town will necessitate either construction of transmission mains and interceptor sewers

through the Village to utilize the VCHWTP or the construction of a Town-owned wastewater treatment plant to serve the South Lansing area.

- Any expansion of sewer collection systems that are discharging to the VCHWTP will require an inter-municipal agreement to access sewer capacity.

## **VILLAGE OF LANSING**

### ***Water***

The Village is served by gravity from 4 tank pressure zones and several smaller areas within these zones are served by pressure reducing valve (PRV) stations. The Village Circle Tank is a 1.0 million gallon tank owned by the Town of Lansing. This tank serves the area east of Warren Road north of NYS Route 13 with 8-, 10- and 12-inch cast or ductile iron pipe. The Sapsucker Woods Tank is a 500,000-gallon tank owned by the Town of Ithaca. This tank serves the area east of Warren Road south of NYS Route 13 with 8- and 12-inch cast or ductile iron pipe. The Airport Ground Tank is a 500,000-gallon tank owned by the Village of Lansing. This tank serves the area east of North Triphammer Road to Warren Road and the Shops at Ithaca Mall with 8- and 12-inch cast or ductile iron pipe. The Burdick Hill Tank is a 1.5 million gallon tank owned by Bolton Point. This tank serves the balance of the Village. Half of this area is fed by gravity, and half by a PRV station with 8-inch cast or ductile iron pipe. This area of the Village used to be served by the Oakcrest Tank, which was removed from service on 2/9/10. The Village will share the cost of the construction of the Burdick Hill sister tank with Bolton Point.

### ***Sewer***

The Village of Lansing provides sewer service to the majority of the Village with the exception of the northwest corner of the Village north of the Shannon Park subdivision and west of Triphammer Road. The Village sanitary sewer system south of NYS Route 13 is an extension of the mains in the Village of Cayuga Heights. There are two connections to the Village of Cayuga Heights system; the corner of Uptown Road and Burleigh Drive and the intersection of Berkshire and Highgate Roads. Sewers that were installed prior to the formation of the Village in 1974 are generally located north of Route 13 in the vicinity of N. Triphammer Road, Graham Road, Dart Drive and Warren Road. No sections of the collection system have been identified as having capacity issues.

### ***Identified Physical Factors and Governance Issues Limiting System Expansion***

- There are no known limitations with the existing water system. However the Village has been experiencing problems with numerous main breaks in the piping along Cayuga Heights Road, North Triphammer and Burdick Hill Roads. There are also several areas in the distribution system that would be benefited by looping of existing pipes. About half of the North Triphammer piping was replaced in 2006 when the road was reconstructed. The Village is considering the remainder of the piping in the future.
- Expansion of sewer service into the northwest portion of the Village would require extending the 15-inch transmission main a considerable distance and possibly trigger upgrades to the VCHWTP or additional flow diversions to the IAWTF.

- Any expansion of sewer collection systems that are discharging to the VCHWTP will require an inter-municipal agreement to access sewer capacity.

## **TOWN OF NEWFIELD**

### ***Water***

The Town of Newfield currently has 3 water districts. Water District No. 1 serves the Main Street area of the Town, Water District No. 2 serves the Inlet Valley Area (on NYS Route 34 & 96) and the Frandsen Water District serves 2 lots along NYS Route 13 (just north of the intersection of South Main Street and Route 13). Water to supply these three districts is pumped from the Newfield Aquifer via four drilled wells. Two of the four wells were installed off of Pine Circle in the 1960s and can pump 180-gpm each. A third well was drilled at the Pine Circle site in 2005 and can pump 55-gpm. The fourth well was drilled in 2005 and can pump 90-gpm. The groundwater quality is good and levels have remained consistent over the last 35 years.

Water from these wells is pumped through the distribution system into a 200,000-gallon storage tank on Trumbull Corners Road. This tank supplies water directly to users in Water District No. 1 and the Frandsen Water District and fills the 150,000-gallon Main Street tank. This tank operates as a transfer tank between Water District No. 1 and No. 2 and provides water to the 300,000 gallon Shelter Valley Tank. This tank directly supplies the users in Water District No. 2.

The distribution system in Water District No. 1 is constructed mainly of 6-inch diameter asbestos cement pipe and is in relatively good condition. The piping in Water District No. 2 was installed in 2006 and should have a lifespan of 50-years or more.

### ***Sewer***

The wastewater treatment plant and wastewater collection system, which serves the Hamlet of Newfield, has been exceeding the permitted flow of 300,000-gpd and the Town has been in close contact with the New York State Department of Environmental Conservation (NYSDEC) regarding the exceeded flows.

In 2009, the Town performed work to reduce infiltration and inflow. This mitigation work, carried out by the Town, brought the system into compliance with the NYSDEC for the year 2009.

It is expected that the Town will have to apply for an increase in the permit and expand the current wastewater treatment facility from four absorption fields to six. This expansion will be required to meet the current NYSDEC directives but could have the added benefit of providing additional capacity for future development subject to NYSDEC approval.

Septic tanks are installed and maintained on most lots. Septic tank effluent is collected and conveyed to the wastewater treatment facility by a combination of pumping and gravity. There are currently three pump stations that lift sewage to the gravity portions of the system.

**Identified Physical Factors and Governance Issues Limiting System Expansion**

- Water capacity is adequate to serve future development but the extension of water to properties at higher elevations will require a higher tank grid to provide adequate service.
- There is no redundancy for the Trumbull Corners Tank so, if the tank is out of service, the distribution of water to any district could only be accomplished with constant pumping.
- Distribution pipe in Water District No. 1 is relatively small in diameter (6-inch)
- The existing wastewater treatment facility will need to be expanded to meet NYSDEC standards.
- In order to increase the capacity of the wastewater collection system, modifications would be required to pumping station number 3. Development projects connecting to those sections of the system that are linear, (e.g., have dead ends) may require fire flows and pressures beyond the capability of the system. In such cases, supplemental infrastructure, such as fire pumps, will be needed.

**VILLAGE OF TRUMANSBURG****Water**

The Village of Trumansburg system is supplied by two wells: the Frontenac Point well and the Indian Fort Road well. The drilled well at Frontenac Point is located in Seneca County and fills the 150,000-gallon storage tank at NYS Route 89 with a 500-gpm pump. Two 350-gpm pumps at the tank lift the water to the 500,000 gallon Halsey Street elevated storage tank which supplies the main Village system. A pump station, built in 2006 off Salo Drive, serves a third pressure zone at the north end of the Village and extends into Seneca County. No storage tank is available for this zone. The 500,000-gallon Halsey Street tank, also built in 2006, is in excellent condition. The Route 89 tank was rehabilitated in 2009. It has an estimated useful life of 10 years. A well on Indian Fort Road is used only during emergencies and can supply less than 70% of the average daily flow. The water from this well suffers from poor aesthetic quality due to sulfur and high minerals. The water at each well is treated with sodium hypochlorite for disinfection.

The distribution system appears satisfactory. Water mains in the business district were recently replaced. Emergency generators are installed at the well site and the Route 89 pump station. The main service area is the Village of Trumansburg, but two small Town of Ulysses Water Districts are supplied with Village water. Town of Ulysses Water District No.1 distributes water to the Cayuga Addiction Recovery Services facility on Route 227. Town of Ulysses Water District No. 2 serves the ShurSave Grocery Store on Route 96. Service is also provided to a few parcels along Seneca Road north of the Village, and to the Boy Scout Summer Camp located along the transmission main on Frontenac Road.

## **Sewer**

The existing wastewater treatment facility serving the Village is an activated sludge plant with a capacity of 250,000-gpd. The effluent is disinfected by ultra-violet radiation and chlorine.

There is limited additional capacity within the current facility and the site is not large enough to effectively add capacity. The Village does own additional land in the vicinity of the treatment plant so an upgrade on the current site is possible. Due to the configuration of the plant any increase in the capacity would require wholesale changes to the layout and operations of the facility.

Flow to the facility is by gravity. There are two small pumping stations in the network, one on South Street and one on Prospect Street, which pump into the gravity network.

### ***Identified Physical Factors and Governance Issues Limiting System Expansion***

- A significant challenge in the Village of Trumansburg water system is the need to create a redundant source of supply. Even though the current well easily provides the average and maximum daily demands, the well has no redundancy. Because the Village depends on only the Frontenac Point well for supply, the Tompkins County Health Department has placed a moratorium on the approval of a new water main extension until another source is available. The Village is currently investigating drilling another well in the vicinity of the one at Frontenac.
- Additional development in the north part of the Village would be enhanced by a storage tank for that pressure zone.
- There are no known issues in the wastewater collection system that would preclude the additional flows allowable under the current plant arrangement and permit.

## **TOWN OF ULYSSES**

### ***Water***

The Town of Ulysses currently has 4 water districts. Water District No. 1 serves the Cayuga Addiction Recovery Services facility on Route 227. This facility is fed off the 500,000-gallon Village of Trumansburg Tank. The facility is served by a 4-inch lateral off an 8-inch main. Water District No. 2 serves the ShurSave grocery store on NYS Route 96 and is fed off the 500,000-gallon Village of Trumansburg tank.

Water District No. 3 serves properties along NYS Route 96 in the Hamlet of Jacksonville, Cold Springs Road, Swamp College Road, Jacksonville Road, Perry City Road and Van Dorn Corners Road. This district is fed off the 200,000 gallon Town of Ulysses tank located on the corner of Iradell and Van Dorn Corners Roads. The distribution system includes 12-inch piping. Water is supplied to the District through the Woolf Lane pump station located in the Town of Ithaca. The water supplier is Bolton Point. An agreement between the Town of Ithaca and the Town of Ulysses allows Ulysses to draw up to 159,000 gallons of water per day to feed Water District No. 3. Water District No. 4 serves three properties on Dubois Road just north of the Town of Ulysses/Ithaca border. This district is fed off the 500,000-gallon Town of Ithaca Trumansburg

Road tank. A similar agreement between the Town of Ithaca and the Town of Ulysses allows Ulysses to draw up to 3,000 gallons of water per day to feed these properties.

### **Sewer**

The Town of Ulysses does not have municipal sewer infrastructure.

### **Identified Physical Factors and Governance Issues Limiting System Expansion**

- The moratorium in the Village of Trumansburg restricting any further water main extensions limits extensions into those areas of the Town adjacent to the Village boundary.

### **SOUTHERN CAYUGA LAKE INTERMUNICIPAL WATER COMMISSION**

The Southern Cayuga Lake Intermunicipal Water Commission is an inter-municipal organization dedicated to providing water to its member municipalities. The current members include the Village of Cayuga Heights, Town of Dryden, Town of Ithaca, Town of Lansing and the Village of Lansing. This facility is permitted to produce 6 million gallons per day of water to be used for domestic consumption and fire fighting and does so by drawing water from Cayuga Lake at its Bolton Point Treatment Plant (the Plant) on Route 34 in the Village of Lansing. In 2008 the Plant produced an average of 2.61 million gallons of water per day with a maximum day production of 4.23 million gallons.

Treated water is pumped from the Plant to three storage tanks throughout the County; the Burdick Hill Tank, the Sheldon Road Tank and the East Hill Tank. The first tank in the system is the 1.5 million gallon Burdick Hill Tank, which is a welded steel tank built in the mid 1970s. This tank is the primary storage tank in the system and is in poor condition. It is slated for rehabilitation or replacement in the next 2 to 5 years. In order to facilitate the rehabilitation or replacement of the tank, a sister tank will be constructed on the same site. The Sheldon Road tank is a 500,000-gallon welded steel tank, which provides water to the Village of Cayuga Heights. This tank is in good condition as it was rehabilitated in 2007. The East Hill Tank is a 3.0 million gallon wire-wound concrete tank, which was constructed off of Ellis Hollow Road in the Town of Ithaca. This tank was sited at an elevation higher than the Burdick Hill and Sheldon Road Tanks and provides higher pressures to various parts of the system. Although distribution system extensions are the responsibility of the individual member municipalities Bolton Point has responsibility for the operation and maintenance of certain system components.

### **Identified Physical Factors and Governance Issues Limiting System Expansion**

- The Plant has the capacity to provide additional water for the purposes of supporting development throughout the County. So the only limitation would be reaching agreements with existing and new members.

### **ITHACA AREA WASTEWATER TREATMENT FACILITY (IAWTF)**

The IAWTF is jointly owned and operated by the City of Ithaca, Town of Ithaca and Town of Dryden. The IAWTF is the largest facility in the region with a total permitted treatment capacity of 13.0 MGD. There is significant additional capacity in the treatment works. The main area, where capacity would be limited, would be in the Final Settling Tanks and the Actiflo system. The Primary Settling Tanks are able to be run with one out of service except under very high

flows and the aeration tanks are capable of being reconfigured if required to accept additional loading. Flow monitoring is via a Parshall Flume in the effluent channel.

The State Pollutant Discharge Elimination System (SPDES) permit will expire in May 2010. It is expected that the phosphorus limits may be reduced at that time, but the operators have no real insight into what the limit may be. The digesters are currently very underloaded. The digester mixing is being upgraded with linear motion mixers and the digester heating is being upgraded also. A new cogeneration system is also being proposed which may be built around microturbines.

Other issues noted were that the bar screens are coarser than desired and, therefore, some minor clogging issues are experienced in the plant. The installation of grit removal prior to the primaries would also assist in the process. Septage receiving facilities are being upgraded currently. There is also an upgrade of the leachate handling facilities planned for the future. Other work currently underway includes an energy analysis plan and evaluation of the aeration system and an upgrade of the lab and staff room.

#### ***Identified Physical Factors and Governance Issues Limiting System Expansion***

- There are occasional wet weather sewer capacity problems with the jointly owned interceptor mains that serve the West Hill and East Hill collection systems. The existing siphon under the Flood Control Channel at Buffalo Street, which serves the Town's collection systems on Trumansburg Road and Elm Street, is flow limited when high rates of infiltration and inflow surcharge the interceptor pipes on Inlet Island.
- On East Hill, segments of jointly owned sewer interceptors within the City on East State Street and below Valentine Place can be flow limited when high rates of inflow and infiltration exceed pipe capacities.
- While the City and Town are aware of the conditions there are no immediate plans to replace or augment the capacity of the existing pipes.

#### **SUMMARY OF WATER AND SEWER INFRASTRUCTURE AND LIMITATIONS**

Tables 2 through 5 summarize the information collected during the municipal interviews and facility tours.

Community	Water Source	Available Capacity (MGD)	Installed Capacity (MGD)	Available Capacity (MGD)	Maximum Daily Demand (MGD)	Notes
Danby (T) West Danby WD	Groundwater	0.144	0.144	0.017	0.034	The district is supplied with water from one well. There is currently no redundancy.
Dryden (V)	Groundwater from 4 Wells	0.680	0.530	0.195	0.390	Supply cannot meet the maximum day demand with the best well out of service.
Groton (V)	Groundwater from 3 Wells and Infiltration Galleries	1,000	1,000	0.375	0.736	No Limitations Identified.
Newfield (T)	Groundwater from 4 Wells	0.300	0.300*	0.157	0.262	Installed production capacity is actually higher than the permitted capacity. A permit update would be required from the NYSDEC to increase the daily withdrawal above 0.300 MGD.
Trumansburg (V)	Groundwater from 1 Well	0.720	0.720	0.211	0.402	Lack of disinfection contact time at Frontenac Well. Supply cannot meet the maximum or average day demand with the best well out of service as there is currently no second source of supply. The TCHD has placed a moratorium on the approval of new water main extensions until another source is available.
Southern Cayuga Lake Intermunicipal Water Commission Member Municipalities: Cayuga Heights (V) Dryden (T) Ithaca (T) - Incl. Ulysses Lansing (T) Lansing (V)	Surface Water Cayuga Lake	6,000	6,000	2,610	4,230	* Percentages based on current metered water consumption for each municipality. Town of Ithaca/Town of Ulysses agreements allow Ulysses to withdraw up to 0.162 MGD (0.159 MGD for WD#3 and 0.003 MGD for WD#4)

Table 2 – Water Supply and Treatment Facilities

Municipality	Service Area	Approximate # Connections	Present Population Served	Total Storage Volume (MG)	Physical Factors and Governance Issues Limiting System Expansion
Cayuga Heights (V)	Village wide	750 +/-	1,600+/-	0.0*	*Served off the Bolton Point 0.5 MG Sheldon Road Tank. No Limitations Identified.
Danby (T)	West Danby Water District	110	273	0.05	Existing storage tank volume limits fire flow duration. Pipes are generally sized for domestic needs only.
Dryden (T)	WD #1 (Varna)	120	178	0.0*	*Served off the Town of Ithaca 0.5 MG Sapsucker Woods Rd Tank.
	Monkey Run WD	18	300	**	**All 4 districts served off the 0.60 MG NYSEG Tanks. Any future extensions to these districts may require additional storage for fire flows.
	Hall Road WD	1	85	**	
	Turkey Hill WD	103	350	**	
	Royal Road WD	6	75	**	
Dryden (V)	Snyder Hill WD	26	110	0.0***	***Served off the Town of Ithaca 0.5 MG Hungerford Hill Rd Tank.
	Cortland Rd WD	15	50	0.0****	****Proposed District - See Dryden (V) note below.
	Village wide	750	2,000+	0.8	A new main is needed to support expansion north of the Village. The existing 1-1/2 inch main behind Lee Road is in poor condition. A higher pressure zone (with a pump at Ferguson Road Tank) would allow development in the Village near the tank.
Groton (V)	Village wide	760	2,470	0.7	Extension of water system beyond Village limits will require the legal formation of Town benefit districts.
Ithaca (T)	Town wide	3,219	8,600+/-	4.75	Watermains in limited areas of South Hill and East Hill are undersized (6") and restrict fire flows.
Lansing (T)	Consolidated Water District	1,370	3,500	1.8	Burdick Hill Pump Station capacity must be increased. Alternatively, demand on the pumps can be reduced by serving more Town pressure zones from the SCLIWC storage tank at Burdick Hill. Municipal and individual booster pumps can be eliminated by creating another pressure zone higher than the Village Circle Tank grid.
	CWD, Ext #1	56	154		
	CWD, Ext #2	7	16		

Table 3 – Water Distribution Systems

Municipality	Service Area	Approximate # Connections	Present Population Served	Total Storage Volume (MG)	Physical Factors and Governance Issues Limiting System Expansion
Lansing (V)	Village wide	683	3500	1.0 (T. Ithaca) 0.5 (T. Ithaca) 0.5 Airport 1.5 Burdick Hill	Watermain along Burdick Hill Road is old and prone to frequent breaks. Numerous breaks have also occurred on Cayuga Heights and Triphammer Roads.
Newfield (T)	WD #1 (Main St) WD#2 (Inlet Valley) Frandsen WD	345 66 3	975 840 0 (148 Future)	0.2* 0.45 0.2*	*Served off the 0.20 MG Trumbull Corners Road Tank. Watermains in WD#1 are undersized (6") and aging which may restrict future fire flows. 0.2 MG Trumbulls Corners tank has no redundancy and is not at an elevation to adequately serve other areas of the Town.
Trumansburg (V)	Village wide	750	1,600	0.5	T.C. Health Department has placed a moratorium on new water main extensions due to the lack of a back-up source of supply.
Ulysses (T)	WD #1 (CARS) WD#2 (ShutSave) WD #3 (Jacksonville) WD #4 (Dubois Rd)	1 1 600 3	55 35 1500 12	0.0* 0.0* 0.2 0.0**	* Served off the Village of Trumansburg 0.5 MG Halsey St Tank. **Served off the Town of Ithaca 0.5 MG Trumansburg Road Tank. Moratorium in the Village of Trumansburg also prevents extensions of Village water to the areas of Town adjacent to the Village boundary. However, portions of the Town that could be served as extensions of WD#4 are not limited except by the capacity and agreements from the Town of Ithaca system.

Table 3 (continued) – Water Distribution Systems

Facility	Permitted Treatment Capacity (MGD)	Present Average Day Flow (MGD)	Present Maximum Month Flow (MGD)	Physical Factors and Governance Issues Limiting System Expansion
Cayuga Heights (V)	2.000	1.214	1.477	Expansion of treatment capacity will be difficult due to limited space to install additional final settling tanks.
Dryden (V)	0.60*	0.310	0.329	*Permitted flow for treatment plant following completion of upgrades in 2011. New plant will achieve phosphorous limits of the new SPDES permit.
Freeville (V)	0.125	0.040	0.048	No Limitations identified.
Groton (V)	0.50*	0.328	0.427	*Permitted flow for treatment plant following completion of upgrades in 2011. New plant will achieve phosphorous limits of the new SPDES permit.
Newfield (T)	0.030	0.040	0.040	Revised SPDES permit and expansion of the absorption field is required to accept additional sewage.
Trumansburg(V)	0.250	0.150	0.230	Present maximum month flow is approaching permit limits.
Ithaca Area Wastewater Treatment Facility	13.000	6.223	9.830	**Present Max Month Flow based on Current Plant Ownership. No physical limitations identified. Interceptor sewers, jointly owned by the City and Town of Ithaca also have capacity and ownership stipulations that can affect access to plant capacity.
Facility Owners:				
Dryden (T)	2% - 0.260	0.123	0.197**	
Ithaca (C)	56% - 7.430	2.231	5.505**	
Ithaca (T)	42% - 5.310	3.869	4.129**	

Table 4 – Wastewater Treatment Facilities

Municipality	Serving Area	Approximate # Connections	Population Served	Physical Factors and Governance Issues Limiting System Expansion
Cayuga Heights (V)	Village wide	750+/-	1,600+/-	No Limitations identified.
Dryden (T)	SD #1 (Sapsucker Woods)* SD #2 (Varna)** Snyder Hill SD Monkey Run SD Turkey Hill SD Royal Road SD Hall Road SD Cortland Road SD	46 74 26 18 103 6 1 32	115 185 65 300 250 75 85 3,200 Incl TC3	Expansion of Sewer District #1 will require an inter-municipal agreement with the VCHWTP to access additional sewer capacity. **If the capacity of the Varna Pump Station needs to be increased, then revised agreements with Cornell University and possible improvements to the Cornell/Dryden transmission main will be required.
Dryden (V)	Village wide	750	2,000+	The sewer main on Elm Street that would transmit sewage from districts outside the Village is undersized.
Freeville (V)	Village wide	300+/-	750 Incl George Jr. Republic	No Limitations identified.
Groton (V)	Village wide	620	2,470	No Limitations identified.
Ithaca (T)	Town wide	3,219	8,600+/-	High rates of infiltration and inflow during wet weather can surcharge a jointly owned interceptor pipe under the Flood Control Channel which serves the West Hill collection system.
Lansing (T)	Cherry Road Sewer District	62	145	Any collection sewer extensions in the southern portion of the Town that are west of N. Triphammer Road will require additional transmission and interceptor sewer construction in the Village of Lansing.
Lansing (V)	All areas except the northwest corner of the Village	561	3,000+/-	Major improvements will be required to serve the NW corner of the Village. May require improvements to the Village of Cayuga Heights transmission main.
Newfield (T)	Sewer District #1 - Main St	189	500+/-	Pump station #3 would need to be relocated and upsized and the Main Street Sewer extended.
Trumansburg (V)	Village wide	750	1,600	No Limitations identified.

Table 5– Wastewater Collection Systems

### WATER AND SEWER AVAILABILITY IN THE RURAL CENTERS

The principles and policies of the Tompkins County Comprehensive Plan encourage a strategy for development that focuses future growth within the city, villages and hamlets. The availability of municipal water and sewer service within the villages and hamlets, collectively referred to as ‘rural centers’, could promote efficient development of suitable vacant lands and adaptive re-use of existing development. Based on the infrastructure data collected for each municipality, the current status of water and sewer availability in the County’s rural centers is illustrated in Figure 1.

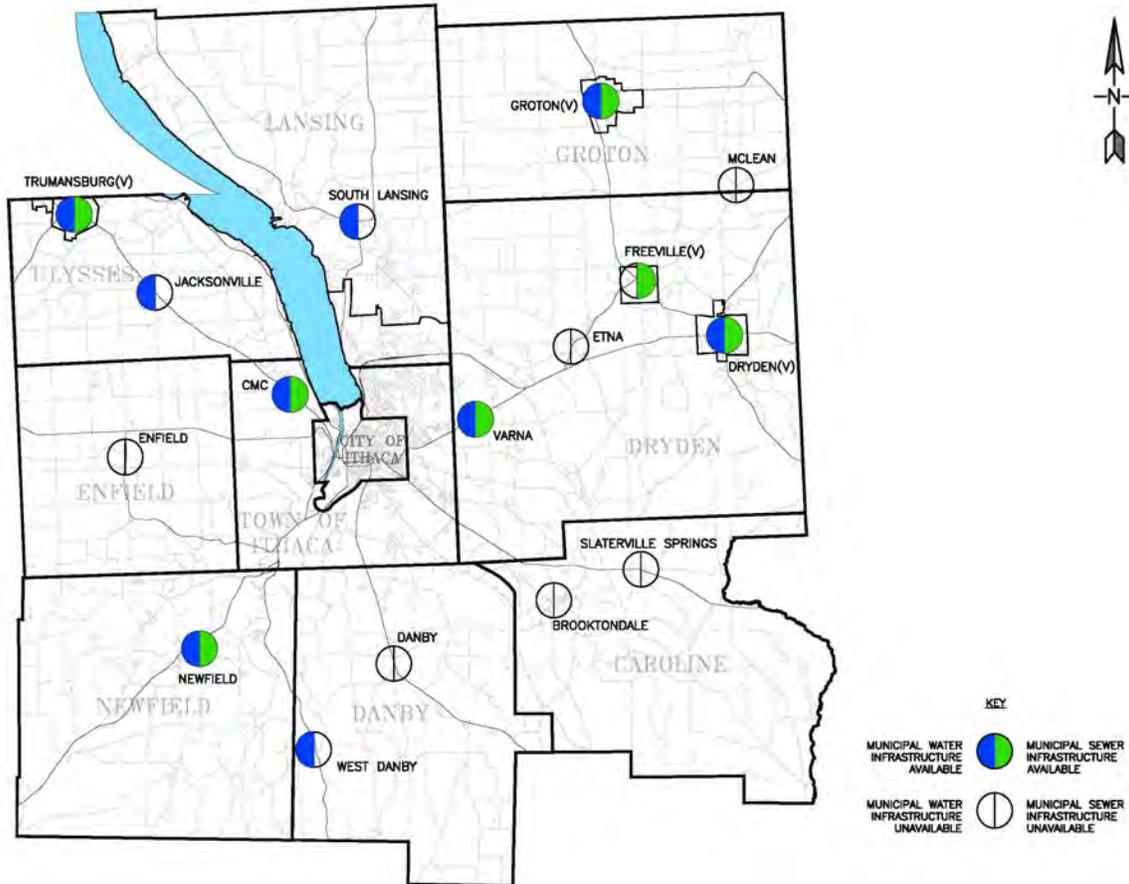


Figure 1 – Water and Sewer Availability in the Rural Centers

## AVAILABLE CAPACITY OF EXISTING FACILITIES

Specific to the municipal water supply and wastewater treatment facilities, the evaluation has quantified the differences between permitted capacity and current use, or, '*available capacity*' as of December 2009.

### *Water Supply and Treatment*

The Bolton Point water treatment facility continues to have ample capacity to meet the demands of the 5 municipal members and the Town of Ulysses. The maximum day production of 4.23 MGD is still well below the permitted capacity of 6.0 MGD.

The water systems in the Villages of Dryden, Groton and Trumansburg and Hamlets of West Danby and Newfield rely on groundwater as the source of supply. Current regulatory standards state that these systems must be capable of delivering the maximum day demand with the best producing groundwater well out of service. At present, only the Newfield water system has sufficient redundant facilities to meet this requirement. The remaining water systems should expect that future applications to the Tompkins County Health Department for the extension of public water mains within these distribution systems, if and when received, could trigger a detailed review to determine if capacity is, in fact, adequate. The Health Department currently has in effect a moratorium on new water main extensions within the Village of Trumansburg service area.

### *Wastewater Treatment*

The VCHWTP is operating at 1.477 MGD of a permitted 2.0 MGD maximum 30-day flow. All of the capacity is owned by the Village and is allocated to neighboring municipalities by contract. The Village is utilizing the Kline Road by-pass to divert to the IAWTF a volume of sewage that represents the Town of Ithaca customers in the Northeast Area.

The VDWTP serves the majority of the Village and limited lands in the adjacent Town of Dryden. Improvements to upgrade the treatment process to a Sequencing Batch Reactor will improve effluent quality and also increase treatment capacity to 600,000-gpd. The current 30-day maximum flow is about 329,000-gpd. Once the plant upgrades are completed, the Village could realize surplus capacity of approximately 271,000-gpd.

The Village of Freeville wastewater treatment works serves only Village customers and the WGAFCS campus. Permitted for 125,000 GPD the two aerated lagoons operate at only 48,000-gpd suggesting there is significant surplus capacity in the facility.

The Village of Groton wastewater treatment plant currently operates in excess of the 350,000-gpd permitted flow. The facility only serves Village properties and is soon to be upgraded to a Sequencing Batch Reactor plant with a design capacity of 500,000-gpd. Once the plant upgrades are completed, the Village will regain surplus capacity of approximately 73,000-gpd.

The Village of Trumansburg Wastewater Treatment Plant (VTWTP) is permitted to treat 250,000-gpd of sewage. The maximum 30-day flow of 230,000-gpd is approaching that limit. The available surplus capacity is 20,000-gpd.

The maximum 30-day flow through the IAWTF in 2008 was 9.83 MGD, or approximately 75% of the 13.0 MGD permit limit. The surplus capacity of 3.17 MGD is owned in varying percentages by the City of Ithaca, Town of Ithaca and Town of Dryden. The recent activation of the Kline Road By-pass in the Village of Cayuga Heights collection system directs a representative volume of sewage for Town of Ithaca customers in the Northeast Area to the IAWTF. The flow values listed above reflect the by-pass.

The following tables summarize the current available capacities in the existing municipal water supply and wastewater treatment facilities by facility owner. To grasp the importance of the available capacities, the volumetric values can be expressed in equivalent units of housing. For the purpose of this study, the volume basis of measurement is converted to an estimated number of equivalent single-family homes, or Equivalent Dwelling Units. The hypothetical conversion used is 1 Equivalent Dwelling Unit (EDU) for every 325 gallons of water or sewage capacity. Based on trends in household size, the factor is considered conservative given that customary engineering practice for sanitary sewer design is 100 gallons per person per day.

Facility	Permitted Production Capacity (MGD)	Installed Production Capacity (MGD)	Present Maximum Day Demand (MGD)	Present Surplus Capacity (MGD)	Potential EDUs*	Water Supply Capacity Limitations
Danby (T) West Danby WD	0.144	0.144	0.034	0.110	350**	System cannot supply max day demand if the "best" well is out of service. Will likely require a detailed review to determine if the capacity is sufficient.
Dryden (V)	0.680	0.530	0.390	0.140	450**	System cannot supply max day demand if the "best" well is out of service. Will likely require a detailed review to determine if the capacity is sufficient.
Groton (V)	1.000	1.000	0.736	0.264	800**	System cannot supply max day demand if the "best" well is out of service. Will likely require a detailed review to determine if the capacity is sufficient.
Newfield (T)	0.300	0.300	0.262	0.038	100	Installed production capacity is actually higher than the permitted capacity. Since a permit update would be required from the NYSDEC to increase the daily withdrawal above 0.300 MGD the permitted capacity was used to calculate the EDUs.
Trumansburg (V)	0.720	0.720	0.402	0.318	1000**	System cannot supply max day demand if the "best" well is out of service. Will likely require a detailed review to determine if the capacity is sufficient. The TCHD has placed a moratorium on the approval of new water main extensions until another source is available. Will likely require a detailed review to determine if the capacity is sufficient.
Southern Cayuga Lake Intermunicipal Water Commission Member Municipalities: Cayuga Heights (V) Dryden (T) Ithaca (T) - Incl. Ulysses Lansing (T) Lansing (V)	6.000	6.000	4.230	1.770	5,450	EDUs to be shared amongst the member municipalities. Access to available plant capacity is on a first-come, first-served basis.
Ithaca (C)	7.000	6.000	4.470	1.530	4,700	Assumes a new membrane plant with an ultimate capacity of 6.0 MGD.
Total EDUs Available:					12,850	

\* 325 gallons per day/Equivalent Dwelling Unit (EDU) Rounded to the Nearest 50 EDUs  
 \*\* Potential water EDUs can only be realized once additional redundant sources of supply are developed.

Table 6 – Available Water Supply Capacities

Community	Permitted Treatment Capacity (MGD)	Feasible Maximum Flow (MGD)	Excess Surplus Capacity (MSD)	Current Flow	Wastewater Treatment Capacity (MGD)
Cayuga Heights (V)	2.000	1.477	0.523	1,600	Allocation to each municipality dependent on sewer units.
Dryden (V)	0.600	0.329	0.271	850	Permitted Flow after 2011 Upgrades are Completed
Freeville (V)	0.125	0.048	0.077	250	
Groton (V)	0.500	0.427	0.073	200	Permitted Flow after 2011 Upgrades are Completed
Newfield (T)	0.030	0.040	0.000	0	
Trumansburg(V)	0.250	0.230	0.020	50	
Ithaca Area Wastewater Treatment Facility	13.000	9.830	3.170	9,750	
Facility Owners:					
Dryden (T)	2% - 0.260	0.197***	0.063	200	
Ithaca (C)	56% - 7.430	5.505***	1.925	5,900	
Ithaca (T)	42% - 5.310	4.129***	1.181	3,650	
Total EDUs Available:				12,700	

\* Maximum Month = Highest Monthly 30 Day Average

\*\* 325 gallons per day/Equivalent Dwelling Unit (EDU) Rounded to the Nearest 50 EDUs

\*\*\* Based on Current Plant Ownership

Table 7 – Available Wastewater Treatment Capacities

## **POTENTIAL DEVELOPMENT FOCUS AREAS WITH EXISTING INFRASTRUCTURE**

Communities with available treatment capacity and ready access to both water and sewer systems will be best positioned to support immediate and future development needs. As can be seen in Figure 1, the Villages of Dryden, Groton and Trumansburg and Hamlets of Newfield and Varna have reasonable access to both water and sewer systems. Further comparison of these rural centers with available water supply and wastewater treatment capacities in Table 6 and Table 7, respectively suggests that only the Villages of Dryden and Groton and the Hamlet of Varna can immediately offer both services to prospective development.

In addition to the rural centers, there are suburban areas within the Villages of Cayuga Heights and Lansing and the Town of Ithaca that have reasonable access to water and sewer systems and treatment facilities with adequate capacities. Development ‘nodes’, or areas of relatively dense mixed-use development, that could accommodate new growth in these municipalities may include the Community Corners area in the Village of Cayuga Heights and the area east of North Triphammer Road in the Village of Lansing. Within the Town of Ithaca, there are three possible development nodes: the area surrounding the Cayuga Medical Center on West Hill, the vicinity of East King Road and Danby Road on South Hill, and the area surrounding the East Hill Plaza. In the Town of Dryden, a possible development node in the area of NYS Route 366 and Pinckney Road could expand the current mix of industrial, commercial and residential land uses. Taken together, the existing rural centers and possible development nodes represent Potential Development Focus Areas where local and regional planning strategies may be implemented to support desired growth. These areas are shown in Figure 2.

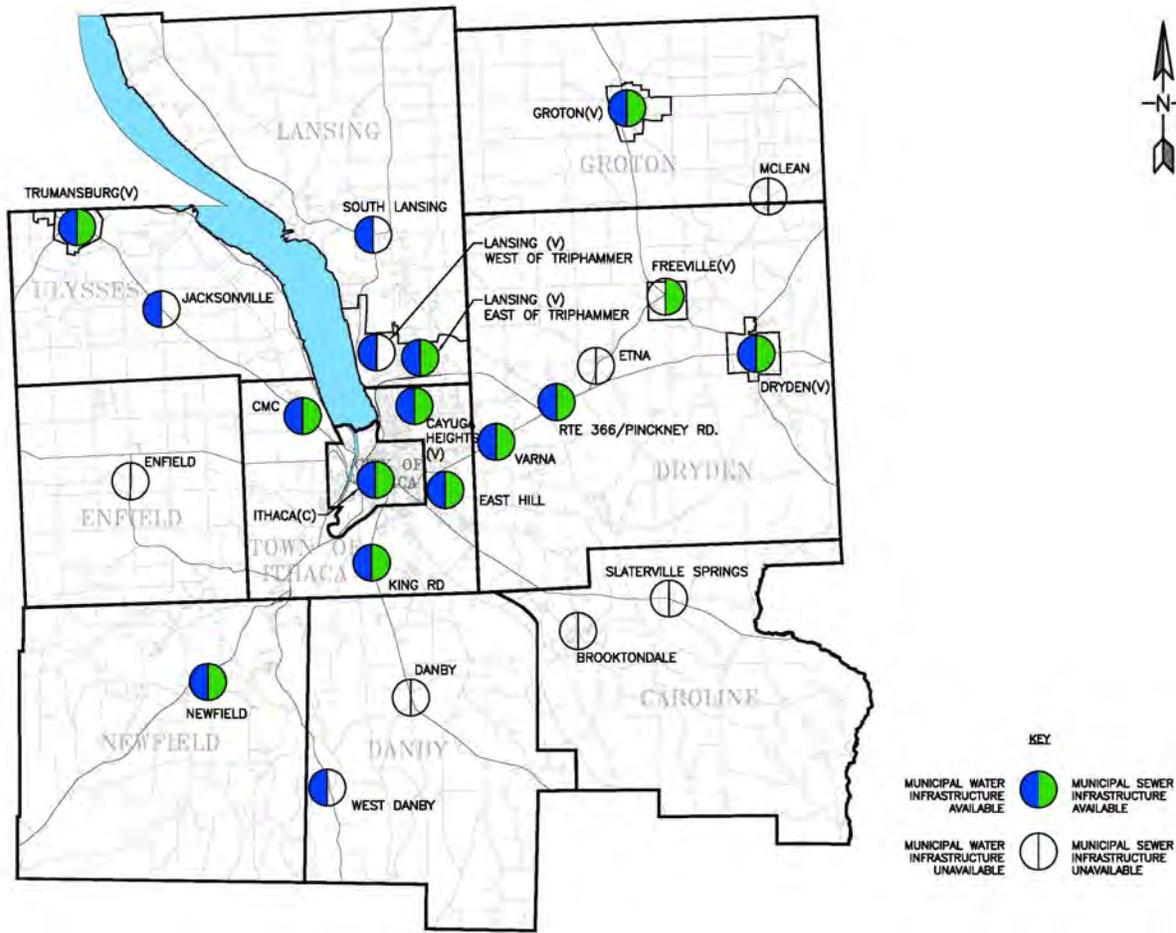


Figure 2 – Potential Development Focus Areas with Water and/or Sewer

### POTENTIAL DEVELOPMENT FOCUS AREA READINESS

Based on the understanding of existing system conditions, available capacities and pending improvement projects, all of the Potential Development Focus Areas can be segregated into likely periods of time or states of ‘readiness’ during which water and sewer service could reasonably become accessible. Several of the Potential Development Focus Areas will require only project specific extensions of water and sanitary sewers and in some cases customary investments in operation and maintenance repairs in order to support development in the next five years. These areas (represented by the green circles on Figure 3) include the Hamlet of Varna, the Villages of Cayuga Heights, Dryden, Groton and Lansing and three areas in the Town of Ithaca; East Hill, King Road and the Cayuga Medical Center. The balance of the remaining Potential Development Focus Areas (represented by the orange or yellow circles on Figure 3) will likely require significant investments in additional infrastructure, such as transmission mains or treatment plant capacity, or intensive inter-municipal negotiations that would delay delivery of water and sewer services within the geographical area beyond five years. For example; although

the Village of Trumansburg has both municipal water and sewer the current moratorium on approving new watermain extensions could delay development within the Village. It is unlikely that the Potential Development Focus Areas represented by the gray circles shown on Figure 3 will have water and/or sewer infrastructure within the next 15 years. The Potential Development Focus Areas from a water and sewer service ‘readiness’ perspective are illustrated in Figure 3.

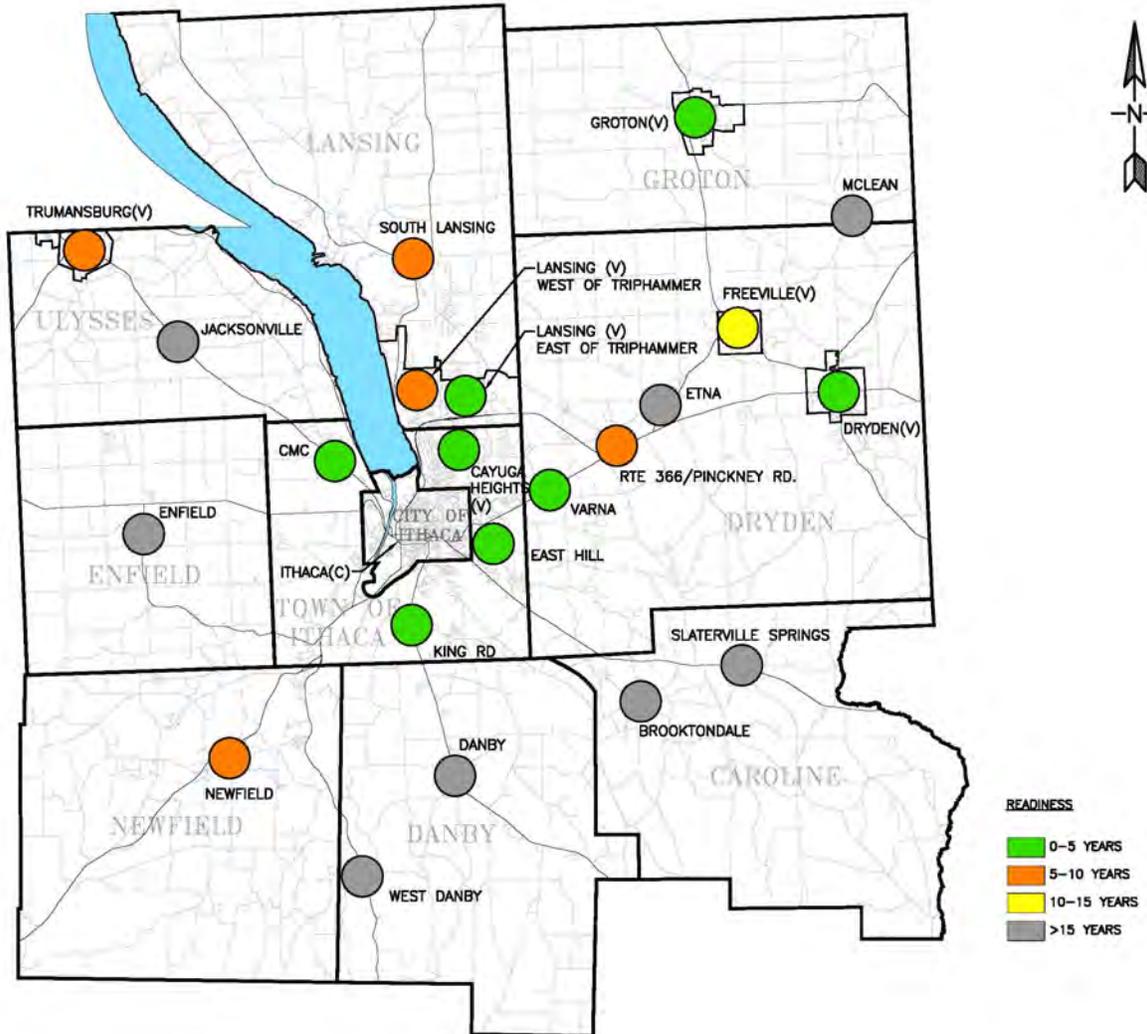


Figure 3 – Potential Development Focus Area Readiness

From Tables 6 and 7 it is inferred there could be the equivalent of 12,850 dwelling units based on available water supply and 12,700 dwelling units based on available wastewater treatment capacity currently available for new development throughout the County. Distribution of the available capacities among the Potential Development Focus Areas, however, must reflect the ownership interests in and actual service areas of the treatment facilities. The summation in Table 8 suggests that, due to either water or sewer limitations, there is most likely 6,100 Potential Equivalent Dwelling Units readily available outside of the City of Ithaca for new development in the Potential Development Focus Areas that exhibit readiness in the next 5 years.

Wastewater Treatment Facility	Potential Development (Number of EDUs in 5 Years)	Potential Water Loads	Potential Sewer EDUs	Limiting Utility (Water or Sewer)	Potential Final Allowance
Village of Dryden	Village of Dryden	450	850	Water***	450
Village of Groton	Village of Groton	800	200	Sewer	200
Southern Cayuga Lake Intermunicipal Water Commission (SCLIWC) 5,450 EDUs Max	Town of Dryden: Varna	5,450 Max.**	-	Sewer	-
	Town of Ithaca: Cayuga Medical Center East Hill King Road			Sewer	-
	Village of Cayuga Heights			Sewer	-
	Village of Lansing: East of Triphammer			Sewer	-
Ithaca Area Wastewater Treatment Facility (IAWTF) 9750 EDUs Max	Town of Dryden: Varna	-	200	Sewer	200
	Town of Ithaca: Cayuga Medical Center East Hill King Road	-	3,650	Sewer	3,650
Village of Cayuga Heights Wastewater Treatment Plant (VCHWTP)	Village of Cayuga Heights: Community Corners	-	1,600	Sewer	1,600
	Village of Lansing: East of Triphammer				
					6,100

\* Potential EDUs = The number of EDUs readily available in the next 5 years based on the limiting utility.  
 \*\* Water Capacity is "First-Come First-Served" - EDUs Limited to Capacity of Receiving Wastewater Treatment Facility.  
 \*\*\* Potential water EDUs can only be realized once additional redundant sources of supply are developed.

Table 8 – Potential Equivalent Dwelling Units by Treatment Facility

**POTENTIAL DEVELOPMENT FOCUS AREAS REQUIRING ADDITIONAL INFRASTRUCTURE**

The Hamlets of Newfield and South Lansing, the Villages of Lansing and Trumansburg, and the Route 366/Pinckney Road area of the Town of Dryden presently lack immediate access to treatment capacity and/or system infrastructure and may require significant investments of public funds to construct new or replacement treatment facilities and extensions of water and sewer systems. While it is outside the scope of this Study to prepare detailed cost estimates for such improvements, there is historical cost information that has been developed by the respective communities that can be used to support an order-of-magnitude analysis. The general costs presented for each of the following Potential Development Focus Areas reflect only the expansion of municipal infrastructure that will afford the community or service area access to water and sewer systems. The additional costs specific to an individual development project cannot be assessed and are not included.

**Town of Dryden - NYS Route 366/Pinckney Road**

Municipal water and sewer infrastructure currently exists in the vicinity of the NYS Route 13 and 366 intersection but does not extend north across NYS Route 13 to Hall Road or Pinckney Road. In 2006 the Town of Dryden Board authorized the preparation of engineering reports to

describe the extension of public infrastructure to serve the commercial properties along Hall Road and the Saunders Concrete property on Pinckney Road. The extension of water and sewer improvements was proposed to terminate at Pinckney Road adjacent to the Saunders Concrete property. However, these districts were never established. As part of that report costs for the water and sewer system improvements were estimated at approximately \$330,000 and \$450,000 respectively. When adjusted for inflation, using the ENR Construction Cost Index, the estimated project costs would be approximately \$370,000 and \$500,000 respectively.

Depending on the Town’s surplus capacity in the IAWTF, an expanded sewer service area outside of the originally conceived limits of the Pinckney Road Sewer District may require the purchase of additional sewage treatment capacity from either the City or Town of Ithaca. The increased flows could also trigger an evaluation of the available transmission capacity in the Cornell University sewer system. Assuming a similar expansion of the water service area the fire flow demand and duration for new development may result in the need for additional water storage capacity. These water and sewer expansions could cost an additional \$460,000 and \$560,000 respectively excluding the costs of additional transmission and water storage capacity.

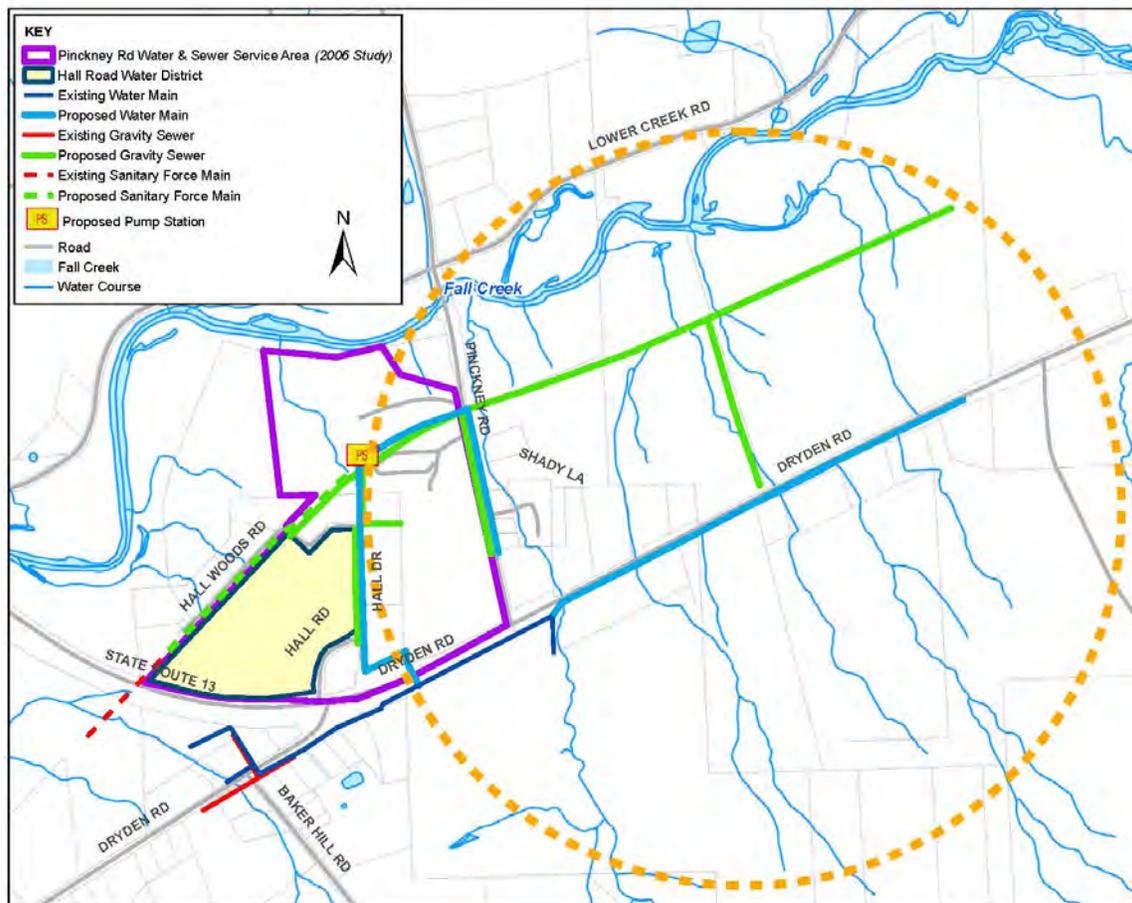


Figure 4 – NYS Route 366/Pinckney Road Potential Development Focus Area

### ***Town of Lansing – South Lansing Hamlet***

A new sewer benefit district encompassing the South Lansing hamlet could potentially serve the existing mix of community, institutional, commercial and residential land uses along and adjacent to the NYS Route 34/34B corridor between N. Triphammer Road and Myers Road. Several large vacant parcels controlled by the Town and centered within the hamlet would be benefitted. The principal institutional and commercial uses within the service area include the NYSOCFS campus, the Lansing Central School District, the Woodsedge Apartments and Cargill. The residential neighborhoods on Myers Road and in the Ladoga Park area would also be served.

A Town-owned wastewater treatment plant having a maximum discharge of 0.5 MGD could be constructed at a location proximate to the Cayuga Lake shoreline. The plant would include an outfall into Cayuga Lake. A 2008 preliminary estimate of project cost prepared by T.G. Miller, P.C. for the collection system and wastewater treatment plant was approximately \$9,144,000. Adjusted for inflation using the ENR Construction Cost Index, the present day cost could be over \$9,575,000.

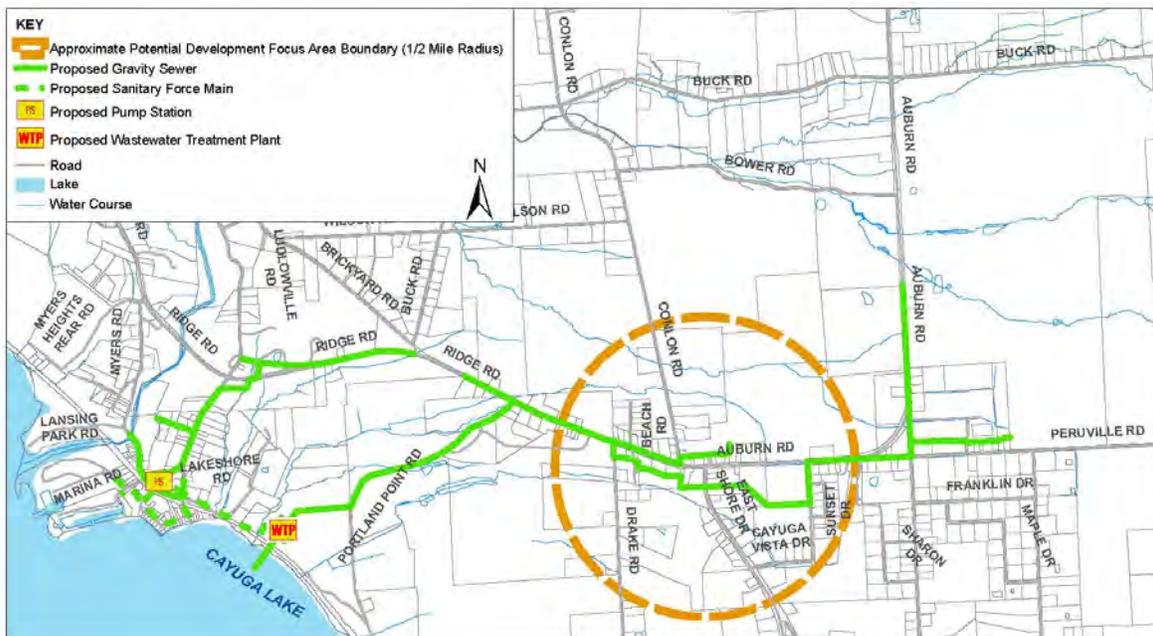


Figure 5 – South Lansing Hamlet Potential Development Focus Area Boundary

### ***Village of Lansing - West of Triphammer***

Expansion of sewer service into the northwest portion of the Village would require either extending the existing 15-inch gravity interceptor main north of Cedar Lane along the former railroad grade to Burdick Hill Road or, alternatively, a combination of smaller diameter gravity collection sewers draining to a centralized sewage pump station with force main discharge into the existing system on Cedar Lane. The basic components of the latter alternative were considered in a 2006 draft Town of Lansing Wastewater Facilities Plan prepared by Stearns & Wheler.

A gravity sewer main installed along Cayuga Heights Road serving parcels adjacent to this street would drain north toward Esty Drive and facilitate a gravity sewer main extension on the western portion of Oakcrest Road and within undeveloped properties outside the existing service area. A sewage lift station in the vicinity of Esty Drive would be down gradient of these gravity mains and would connect to the existing gravity sewer on Cedar Lane with a force main. Using the unit prices predicted in the 2006 Plan and adjusting for inflation based on the ENR Index, a gross estimate of the project cost for this system expansion is approximately \$2,800,000. In addition to this infrastructure cost, if significant additional flows from an expanded service area would utilize all of the surplus capacity in the VCHWTP then capacity upgrades at the VCHWTP or new flow diversions to the IAWTF would be necessary. Negotiations and execution of inter-municipal agreements to facilitate either of these capacity expansion scenarios will be required.



Figure 6 – Village of Lansing (West of Triphammer) Potential Development Focus Area

### ***The Newfield Hamlet***

The wastewater treatment facility consists of multiple absorption fields for disposal of collected septic tank effluent. Flows to the treatment facility have been exceeding permit limits. It is expected that the Town will have to apply to NYSDEC for an increase in the permit and expand the number of absorption fields. This expansion may be required if additional development occurs within the service area or not. Subject to NYSDEC approval, it may be possible to increase the treatment capacity for some future development at the time the facility is upgraded for permit compliance. Expansion of the absorption field may cost between \$400,000 and \$500,000.

Increased flows from future development may also impact capacity in one of the existing effluent pump stations. The cost of expanding and modifying the existing pump station could exceed \$125,000.

### ***Village of Trumansburg***

To address the need for a redundant source of groundwater supply for the water system, the Village recently authorized the preparation of a preliminary engineering report to identify the physical improvements and associated costs to install an additional well in the vicinity of Frontenac Point and a dedicated transmission main from the existing and proposed Frontenac wells to the NYS Route 89 storage tank. The new transmission main would be free of any service connections and will enhance chlorine contact time needed for disinfection. The preliminary estimate of project cost prepared by Hunt Engineers, Architects & Land Surveyors to complete these improvements is approximately \$1,185,000.

## **FUTURE EDUs IN THE POTENTIAL DEVELOPMENT FOCUS AREAS**

Should the future expansion of water and sewer infrastructure occur in any or all of the Potential Development Focus Areas as described in the previous section, there could be a resultant increase in the number of dwelling units of water supply and wastewater treatment capacity accessible for new development. To quantify the possible additional EDUs, a vacant land analysis was performed in a manner loosely similar to the process outlined in the Affordable Housing Needs Assessment. In this Study, a list was generated of existing parcels identified by the Tompkins County Department of Assessment as ‘vacant’ or ‘single family residential greater than 5 acres’ that fall within the proximate limits of the Potential Development Focus Area. The list of parcels did not consider environmental features such as slopes over 15 percent; State and Federal wetlands; Tompkins County designated Unique Natural Areas; flood plain; and riparian buffers. Instead, the aggregate acreage was discounted by 20 percent to account for these likely environmental constraints that may preclude some lands from being developed. It was assumed that higher density housing made possible with water and sewer service could be in a range of 4 to 10 dwelling units per acre. Further, the expansion of water and sewer service areas in the Route 366/Pinckney Road, South Lansing Hamlet and Village of Lansing (West of Triphammer) Potential Development Focus Areas create opportunities to access lands for new development sites. The capital improvements described for the Hamlet of Newfield and Village of Trumansburg while providing some potential for increasing EDUs primarily restore capacity in the respective wastewater treatment and water supply facilities in response to regulatory requirements.

Based on the analysis parameters described above the estimated range of future EDUs associated with expansion of municipal water and sewer systems is between 2,850 and 7,300.

Potential Development Focus Area	Vacant Parcels		Residential Properties		Total Combined Acreage	Total Acreage Accounting for Environmental Constraints*	Potential Future EDUs Available**
	Number of Parcels	Acreage	Number of Properties	Acreage			
Dryden (T) Route 366/Pinckney Road	6	280	1	7	287	230	900-2,300
Lansing (T) South Lansing Hamlet	19	159	6	194	353	282	1,100-2,800
Lansing (V) West of N. Triphammer	9	72	3	201	273	218	850-2,200
Total	34	511	10	402	913	730	2,850-7,300

\* Assumes a 20% reduction in acreage to account for lands with environmental constraints.

\*\* EDUs based on a density range of 4-10 dwelling units per acre rounded to the nearest 50 EDUs.

Table 9 – Potential Future Equivalent Dwelling Units

## STUDY CONCLUSIONS

The substantive findings of the Study are summarized in this section.

### General

- Municipalities are proactively planning and undertaking repairs and upgrades to existing treatment facilities and piping systems. The Villages of Dryden and Groton are implementing sewage treatment plant upgrades to meet new effluent discharge limits and moderately increase capacity. A new sewer service area and collection system in the Town of Lansing will soon be constructed in the vicinity of Warren Road. The City of Ithaca is planning on replacing their existing water treatment plant on Six Mile Creek. The Town of Ithaca is designing several pipeline replacement projects and has initiated a utility master planning study. In the Town of Danby, the West Danby Water District recently completed a detailed investigation of the water supply, storage and distribution facilities.
- Municipal water systems utilizing groundwater sources can have limited redundancy. The water systems in West Danby and the Villages of Dryden, Groton and Trumansburg cannot adequately supply the maximum day demand if the best producing groundwater well is out of service. Applications to the Tompkins County Health Department for the extension of public water mains within these distribution systems, if, and when received, could trigger a detailed review to determine if capacity is sufficient. The Health Department currently has in effect a moratorium on new water main extensions within the Village of Trumansburg service area. This moratorium shifts the Village into the 5-10 year ‘readiness’ category.

### ***Capacity***

- The Southern Cayuga Lake Intermunicipal Water Commission (Bolton Point) water treatment facility continues to have surplus capacity to meet the demands of the 5 municipal members and the Town of Ulysses. Average and maximum day production is still well below the permitted capacity and should remain so for the next 10 or more years.
- The Ithaca Area Wastewater Treatment Facility (IAWTF) has surplus wastewater treatment capacity as a whole with each of the 3 owners maintaining an allocation of that capacity. Activation of the Kline Road by-pass in the Village of Cayuga Heights collection system is now directing a representative volume of sewage for Town of Ithaca customers in the Northeast Area to the IAWTF. The ability of the 3 owners to buy and sell additional treatment capacity from each other assures that adequate capacity will remain available in this facility for the next 10 years and beyond.
- The Village of Cayuga Heights Wastewater Treatment Plant (VCHWTP) has spare treatment capacity and utilizes the Kline Road by-pass to divert a representative volume of sewage for Town of Ithaca customers in the Northeast Area to the IAWTF. Continued use of the by-pass would allow the surplus capacity to be accessible for additional sewer connections during the next 10 years.
- Current flow conditions experienced at the Village of Trumansburg Wastewater Treatment Plant suggest a minimal volume of capacity remains in this facility.
- The sewage disposal system serving the Hamlet of Newfield has reached and exceeded the maximum month flow indicating there is no surplus treatment capacity.
- The current surplus capacity in municipal water supply and treatment facilities throughout Tompkins County (including the City of Ithaca) suggests that an equivalent of 12,850 additional units of housing can be served.
- Based on the existing utilization of wastewater treatment facilities throughout Tompkins County (including the City of Ithaca), there is treatment capacity available to support the equivalent of 12,700 units of new housing.

### ***Equivalent Dwelling Units***

- Potential Development Focus Areas with the greatest potential to access water and sewer service in support of affordable housing or mixed-use development include the Villages of Cayuga Heights, Dryden, Groton and Lansing; the Hamlet of Varna; and nodes on South Hill (King Road/Danby Road), East Hill (East Hill Plaza) and West Hill (CMC) in the Town of Ithaca. Distribution of available capacity among the Potential Development Focus Areas, when facility ownership and geographic setting are considered, predicts there is more likely 6,100 Equivalent Dwelling Units of combined capacity immediately available for all types of new development.
- In the future, the simultaneous expansion of water and sewer service areas in the Potential Development Focus Areas including the Hamlet of South Lansing, the Village of Lansing (west of North Triphammer Road) and the Route 366/Pinckney Road area of the Town of Dryden could generate an additional 2,850-7,300 Equivalent Dwelling Units of combined capacity for new development.

***Inter-Municipal Agreements***

- 9 of the 12 municipalities that have municipal water and/or sewer participate in inter-municipal service agreements.
- 90% of the water supplied from municipal sources is distributed between municipalities that operate under inter-municipal agreements.
- 96% of the wastewater collected by municipal sewer systems is treated by municipal facilities that operate under inter-municipal agreements.
- 97% of the equivalent dwelling units that could be readily supplied within 5 years would continue to be served by water supply and wastewater treatment facilities that operate under inter-municipal agreements.
- 60% of the Potential Future Equivalent Dwelling Units that could be supplied with both water and sewer service within 5 to 10 years would trigger additional inter-municipal agreements.

## GLOSSARY OF TERMS

**Activated Sludge:** a process of wastewater treatment in which wastewater is aerated to remove biological contaminants.

**Artesian Aquifer:** an aquifer in which ground water in porous rock or soil is confined under significantly greater than atmospheric pressure by impermeable geological formations (also called a **Confined Aquifer**). An **Unconfined Aquifer** is one whose upper surface is a water table free to fluctuate.

**Aquifer:** a geological formation that contains sufficient saturated, permeable material to yield significant quantities of water to wells and springs.

**Booster Pump:** A pump that increases pressure in an area of the water distribution system with low pressure.

**Clarification:** The process of separating solids from the liquid during water treatment.

**Coagulation:** The clumping together of very fine particles into larger particles caused by the use of a coagulant. This clumping together makes it easier to separate the solids from the water by settling or filtering.

**Cogeneration:** A plant to generate electricity from the waste gas produced by a **Digester**.

**Collection System:** The network of pipes and pumping stations that collects wastewater and conveys it to a wastewater treatment plant.

**Digester:** A unit in a wastewater treatment plant for treatment of sludge to remove biological and bacterial contaminants prior to reuse or disposal.

**Disinfection:** The process designed to kill most microorganisms in water, including essentially all pathogenic (disease-causing) bacteria. There are several ways to disinfect with chlorine being most frequently used in water treatment.

**Distribution Mains:** The water pipes that transport the water from the storage tanks and supply the water to customers.

**Equivalent Dwelling Unit (EDU):** a unit of water or wastewater capacity that standardizes all uses (residential, office, retail, commercial, etc) to the level of demand created by one single-family housing unit.

**Flocculation:** The gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals, to form larger particles.

**Force Main:** A water pipe containing pumped flows from a wastewater or water pumping station.

***Infiltration and Inflow:*** Flow into the sewerage system which is not from known sewer connections, i.e. from stormwater or groundwater.

***Infrastructure:*** refers to water supply facilities (groundwater wells, infiltration galleries, reservoirs, and surface water intakes), water or wastewater treatment facilities, water transmission and distribution systems (pump stations, storage tanks, and pipe) and wastewater collection systems (septic tanks, pump stations, force mains, manholes and pipe).

***Installed Production Capacity:*** for a Water Supply Treatment Facility, this is the amount of water that the available wells, pumps, or treatment equipment are able to pump and /or treat. This may equal, or be greater than or less than the **Permitted Production Capacity**.

***Interceptor Sewer:*** A large diameter sewer pipe that collects (or intercepts) the flow from several other sewers.

***Microfiltration:*** Filtration using membranes with a pore size of around 0.2  $\mu\text{m}$ .

***Onsite sewage disposal system:*** an onsite wastewater treatment/disposal system is one which an individual home or business, or a cluster of homes, treats and disposes of its wastewater. It is also known as a “decentralized system” a “private system” and very commonly as a “septic system” because a typical household system consists of a house sewer, septic tank, distribution box and absorption field or other constructed method to discharge the treated wastewater into the ground. However, some systems may discharge into a stream or lake, and some may use aerobic systems. The system is typically owned and maintained by the land owner and serves only that property.

***Outfall:*** The point of discharge from a wastewater system or treatment plant to the environment.

***Permitted Production Capacity:*** for a Water Supply Treatment Facility, this is the amount of water that the regulatory authority has authorized may be withdrawn from the water source.

***Permitted Treatment Capacity:*** for a Waste Water Treatment Facility, this is the amount of treated sewage that the regulatory authority has authorized may be discharged to the groundwater or a lake or a stream through a State Pollutant Discharge System Permit.

***Potential Development Focus Area:*** areas of relatively dense mixed-use development that can potentially accommodate new growth by using or building upon the resources that existing neighborhoods provide. The availability of existing infrastructure varies from area to area.

***Precipitating:*** coming out of solution and returning to a solid form.

***Present Average Day Demand:*** for a Water Supply Treatment Facility, this is the daily amount of water used, normally calculated over a calendar year. Typically the daily average is calculated each month by dividing the total water produced in that month by the number of days; then the Present Average Day Demand is calculated by dividing the sum of these twelve monthly

averages by twelve. The data is usually the amount of water produced so it includes all uses including non-metered uses such as fire fighting, water main flushing, and leaks.

***Present Average Day Flow:*** for a Waste Water Treatment Facility, this is the daily amount of sewage processed, normally calculated over a calendar year. Typically the daily average is calculated each month by dividing the total water processed in that month by the number of days; then the Present Average Day Flow is calculated by dividing the sum of these twelve monthly averages by twelve.

***Present Maximum Day Demand:*** for a Water Supply Treatment Facility, this is the maximum amount of water produced in any day, normally in the past calendar year. For most design purposes this is assumed to be twice the **Average Day Demand**. It is generally less than twice for large systems but may be greater for small systems due to the impact from fire fighting, flushing water mains, or manual control of pumps.

***Present Maximum Month Flow:*** for a Waste Water Treatment Facility, this is the largest of the twelve monthly averages of sewage processed in the recent calendar year.

***Present Surplus Capacity:*** for Water Supply Treatment Facility, this is the lesser of either the **Permitted Production Capacity** or the **Installed Production Capacity** minus the **Present Maximum Day Demand**. For a Waste Water Treatment Facility, this is the **Permitted Treatment Capacity** minus the **Present Maximum Month Flow**.

***Pressure Reducing Valve (PRV):*** A valve that reduces high water pressure, predominantly in low-lying areas.

***Primary Treatment:*** The first major treatment process in a wastewater treatment plant, generally settling or clarification.

***Private Water Supply:*** a private water supply or system is one which an individual home or business provides its drinking water. It typically consists of a drilled well with a pump and pressure tank and serves only the property on which it is located.

***Secondary Treatment:*** The second major treatment process in a wastewater treatment plant which is generally to remove biological contaminants with or without further clarification.

***Sequencing Batch Reactor (SBR):*** A process of treating wastewater biologically is by applying different levels of oxygenation to the wastewater in sequence.

***Settling:*** See **Clarification**

***Sewer:*** a pipe in which wastewater (sewage) flows.

***Sewerage System:*** a whole system of sewer pipes including collection sewers (collectors) and interceptor sewers (interceptors).

**Sodium Hypochlorite:** A solid form of chlorine commonly used in water treatment.

**Tertiary Treatment:** The third major treatment process in a wastewater treatment plant. Generally involves filtration and / or disinfection.

**Transmission Mains:** The pipes that transport water between water treatment plants and storage tanks or between storage tanks prior to **Distribution** to customers.

**Trickling Filter:** a bed of gravel or pebble media through which wastewater percolates and microbial activity removes biological contaminants.

**Ultrafiltration:** pressure driven filtration of materials from water using a membrane pore size of approximately 0.03 to 0.1  $\mu\text{m}$ .

**Water Supply Treatment Facility:** A facility containing a series of tanks, screens, filters and other processes by which pollutants are removed and/or organisms inactivated from water intended for drinking.

**Waste Water Treatment Facility:** A facility containing a series of tanks, screens, filters and other processes by which pollutants are removed from waste water before it is discharged to the environment (ground water, stream or lake).

## **APPENDICES**

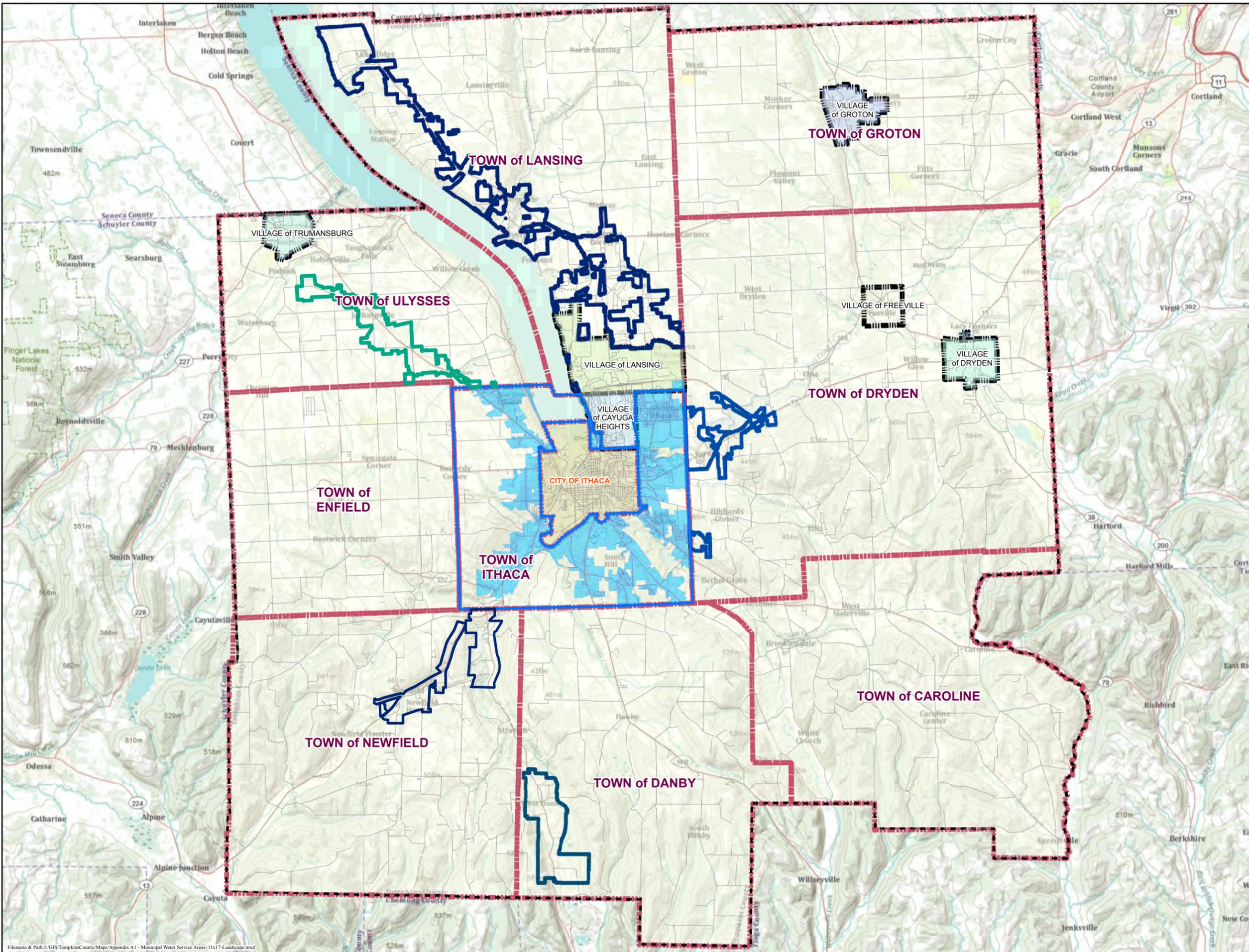
The following Appendices supplement the information contained in the study.

- Appendix A1: Municipal Water Service Areas Map
- Appendix A2: Municipal Sewer Service Areas Map
- Appendix B1-B23: Municipal Infrastructure Interview Forms



APPENDIX A1: MUNICIPAL WATER SERVICE AREAS MAP





NOTES:  
 - TG Miller PC provided data and information used to create this map.  
 - Base map was provided by ArcGIS Online.  
 - Tax Parcel Data contained in this product was originally produced by/for the Tompkins County ITS GIS Division and may not be reproduced or redistributed without the express written consent of the originator.  
 - Road and Municipal Boundary Information was obtained through CUGIR, the Cornell University Geospatial Information Repository, who developed the GIS data set versions of 2000 Census TIGER/Line files using US Department of Commerce, Bureau of the Census data. Cornell University provides these geographic data "as is."  
 - Entities providing information for this map make no guarantee as to the accuracy or completeness of the data, nor that locations depicted represent true location. The Data are neither a legally recorded map or survey and are not intended to be used as one. They should be used for reference purposes only and only for the intended use.  
 - This information was collected as part of professional services performed by Stearns & Wheeler, LLC. Efforts have been made to create a reasonably accurate portrayal of geographic data. However, Stearns & Wheeler, LLC expressly disclaims any responsibilities or liabilities from the use of this data.



March 2010

Prj.Mgr: RW

GIS Tech: DAO

**KEY**

- Town of Newfield Water Districts
- Town of Ulysses Water Districts
- Town of Ithaca Water District
- Town of Ithaca Tank Service Areas
- Town of Lansing Water District
- Town of Dryden Water Districts
- Town of Danby Water District
- Village of Lansing Water Service Area
- Village of Trumansburg Water Service Area
- Village of Groton Water Service Area
- Village of Dryden Water Service Area
- Village of Cayuga Heights Water Service Area
- Road
- City of Ithaca
- Village Boundary
- Town Boundary
- County Boundary

**GHD** **STEARNS & WHEELER**  
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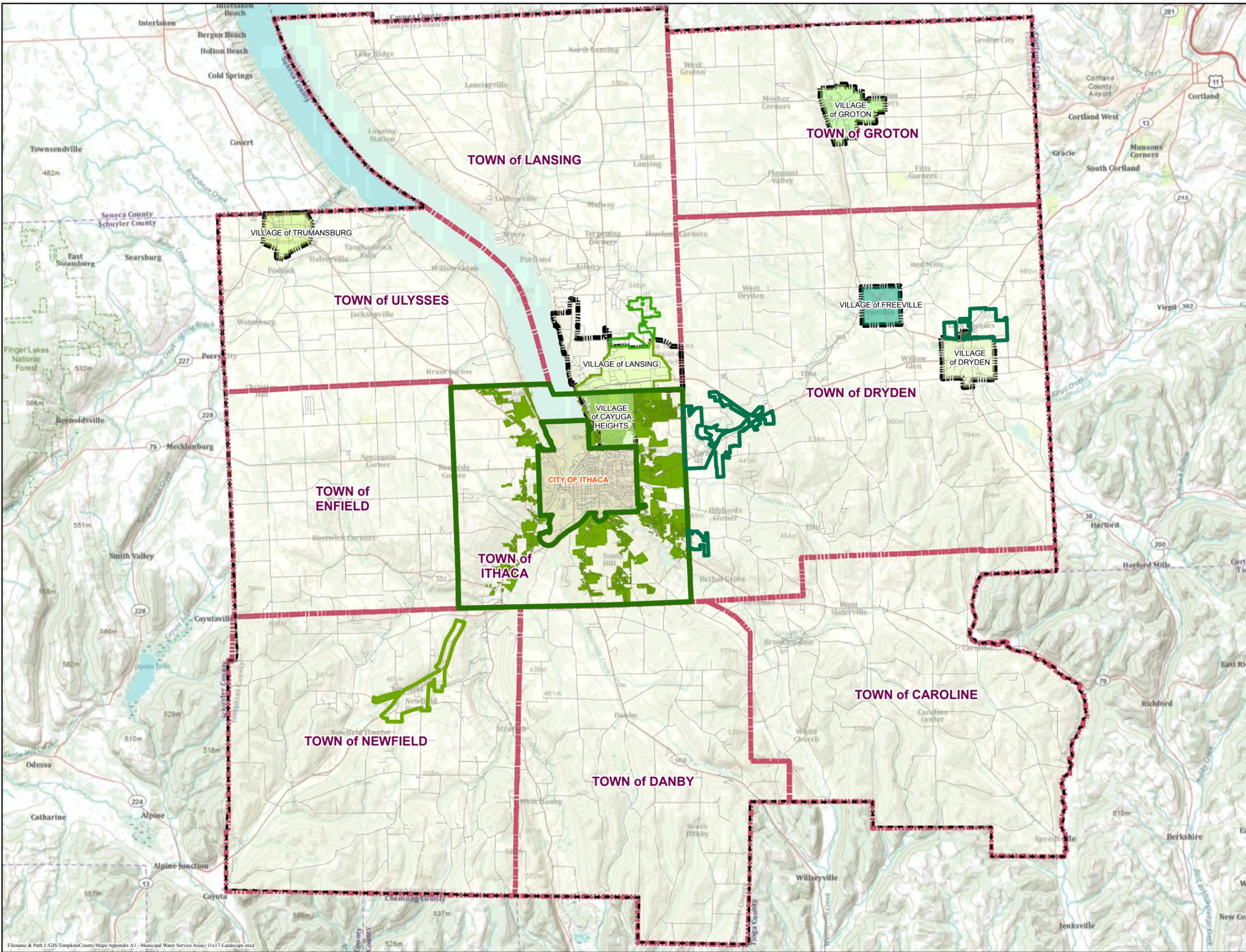
**T.G. Miller, P.C.**  
 Engineers & Surveyors

**Tompkins County, NY**  
**MUNICIPAL WATER SERVICE AREAS**  
**APPENDIX A1**



APPENDIX A2: MUNICIPAL SEWER SERVICE AREAS MAP





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N  
  
 March 2010  
 Prj.Mgr: RW GIS Tech: DAO

- KEY**
- Town of Dryden Sewer Districts
  - Town of Newfield Sewer District
  - Town of Ithaca Sewer District
  - Town of Ithaca Sewer Zones
  - Town of Lansing Sewer Districts
  - Village of Lansing Sewer Service Area
  - Village of Freeville Sewer Service Area
  - Village of Trumansburg Sewer Service Area
  - Village of Groton Sewer Service Area
  - Village of Dryden Sewer Service Area
  - Village of Cayuga Heights Sewer Service Area
  - Road
  - City of Ithaca
  - Village Boundary
  - Town Boundary
  - County Boundary

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**T.G. Miller, P.C.**  
Engineers & Surveyors

**Tompkins County, NY**  
**MUNICIPAL SEWER**  
**SERVICE AREAS**  
**APPENDIX A2**



APPENDIX B1-B23: MUNICIPAL INFRASTRUCTURE INTERVIEW FORMS



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Village of Cayuga Heights

Phone No: 607-257-5536 Interviewed by:

Contact: Brent Cross, Village Engineer/Public Works Superintendent

Rory Waddell / John Andersson

Date: November 5, 2009

E-Mail: bcross@cayuga-heights.ny.us

### Consultant's Remarks from Wastewater Treatment Works Tour:

Plant is operated by Yaws environmental lab on behalf of the village. Recent plant upgrades prior to the new cloth filters were a new roof on the secondary digester and the extension of the trickling filter walls and addition of plastic media. The SPDES permit is due for renewal in 2010. A mercury minimization program is also being implemented at the plant.

If a capacity increase at the plant was desired over and above the 2.0 mgd flow that the current permit allows the difficulty would be in increasing the capacity of the final settling tanks. It would be relatively straightforward to increase the capacity of the primary treatment and the filtration by addition of a primary sedimentation tank and an additional cloth filter. The trickling filters have capacity in excess of the permitted flow so no augmentation would be required there. In order to increase the capacity of the final settling tanks however a new tank would need to be constructed on top of the existing access road and a new access to the plant would be required.

Rated Capacity per NYSDEC SPDES Permit #NY-002 0958: 2.0 mgd (30 day average)

Average Day Flow from DMR (last 12 months): 1.214 (8 months data)

Maximum 30-day Flow from DMR (last 12 months): 1.477 mgd (8 months data)

### General Description of Treatment Works Processes:

Flow comes in to an integrated screen / screenings press that discharges into a large bin for disposal. There is an aerated grit chamber with air lift pumps that discharge into a grit washer. This is operated once a week on average. The plant has 3 x primary sedimentation tanks with sludge pumped to the primary digester. The flow is then pumped to two trickling filters by 3 duty / duty / shared standby variable speed pumps. The trickling filters contain around 15 ft of plastic media and are run in parallel. The trickling filters are rated for 5 mgd flow. The effluent from the trickling filters is dosed with Ferric Chloride and passes through 2 x Final Settling Tanks prior to being pumped to new cloth filters which have been recently installed as a part of a phosphorus removal upgrade at the plant. There is capacity for further Ferric Chloride and polymer dosing to the influent to the cloth filters however only polymer is currently dosed. Following filtration the effluent is disinfected with sodium hypochlorite and passes through a chlorine contact tank prior to discharge to Cayuga Lake. Sludge treatment is by anaerobic digestion. The sludge from the primary settling tanks is pumped to the primary digester and the sludge from the final settling tanks is pumped to the secondary digester. The digester gas is used to fuel the sludge heater with additional gas makeup when digester gas is not sufficient. Excess gas is flared to atmosphere. The sludge is dewatered by a belt press and produces around 20 tons of dewatered sludge / month at 18-20% dry solids. The sludge is disposed of to land in Seneca County. The plant has a backup diesel generator.

### General Description of Collection and Transmission Systems:

Flow comes into the plant by gravity.

No major issues in collection system.

Note that the flows above are with the current Kline Rd diversion in place. There is a possibility that flows currently diverted to the Ithaca Area WWTP by this diversion could be redirected to Cayuga Heights WWTP. If this was to occur an additional 100,000 to 200,000 gallons per day would be received at the plant.

**Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:**

**Identified Limitations to Extending the Collection System:**

Some ragging issues at the primary digester were observed. The existing grit system is old and requires regular maintenance. The screenings and grit building also requires maintenance. The existing chains and flights for the sludge scrapers in the PSTs are in the process of being replaced.

Approximate Population Served by Treatments Works: Approximately 1,600 people

Approximate Number of Service Connections: Approximately 750

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Town of Danby, West Danby Water District

Phone No: 607-277-0799 Interviewed by:

Contact: Eugene Beavers, Town Councilman/Water District

Fax No: 277-0559 David Herrick

Commissioner: Sue Beeners, Town CEO; Ric Dietric, Supervisor

Date: December 7, 2009

E-Mail: SBeeners@aol.com

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

The drilled well at the Sylvan Lane pump station is the only source of supply for the water district. The well is 275 feet deep and is well protected from any threatening adjacent land uses.

Rated Capacity per NYSDEC Withdrawal Permit WSA #5399: 17,000 gpd

Average Day Production (last 12 months): 34,000 gpd  
Maximum Day Production (last 12 months): 34,000 gpd

### General Description of Treatment Plant Processes or Groundwater Sources:

Groundwater quality and level have remained consistent over the last 40 years. Liquid chlorine is injected for disinfection and to maintain appropriate residual levels in the distribution system.

### General Description of Distribution and Storage Systems:

The distribution system is a combination of 8, 6 and 3-inch pipe and was intended to adequately serve the domestic needs of the district. There are only three fire hydrants located in the West Danby hamlet. The sole storage tank is constructed of welded steel and has a useable capacity of 50,000 gallons. The storage volume is more than adequate for the domestic demand but offers limited fire flow duration. Static and residual pressures throughout the district are within an acceptable range.

### Identified Treatment Plant Deficiencies, Regulatory Compliance Problems, Complaints:

The single well deviates from current standards that require two sources of supply, preferably in different aquifers or different locations of an aquifer. Only 3 hydrants exist in the district and serve the central portion of the hamlet thereby limiting fire protection

### Identified Limitations to Extending the Distribution System:

The storage tank has limited fire flow duration if future main extensions are required to provide fire protection per current standards. The structural steel members of the tank's roof need to be repaired.

Approximate Population Served by Treatments Works: 273

Approximate Number of Service Connections: 110



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Town of Dryden Phone No: 607-844-8888 Interviewed by: \_\_\_\_\_  
Contact: Jack Bush, Town Highway/DPW Superintendent Fax No: 607-844-8008 Andy Sciarabba/Dave Putnam  
Date: December 8, 2009 E-Mail: TownHighway@dryden.ny.us

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

Most of the Town of Dryden is on private well systems. The areas that do have municipal water receive their treated water from the SCLIWC (Bolton Point). Properties north of the Village of Dryden (Including the Dryden HS/MS, TC3 and Properties on North Road) receive water from the Village of Dryden. There are also a number of private water systems not maintained by the Town.

Rated Capacity per NYSDEC Withdrawal Permit : N/A

Average Day Production (last 12 months): N/A

Maximum Day Production (last 12 months): N/A

### General Description of Treatment Plant

N/A

### General Description of Distribution and Storage Systems:

The Town of Dryden currently has 6 water Districts. Water District No. 1 serves the Varna area and is supplied by the 500,000 gallon Town of Ithaca Sapsucker Woods Road Tank through the Town of Ithaca's distribution system and the Apple Orchard PRV on the Bolton Point T-main. This tank is supplied by a Town of Ithaca Pump Station and the Apple Orchard PRV. The distribution system consists of 8-inch pipe.

The Monkey Run Water District serves properties on Rte 366 north of Varna, Barr Road and Abbot Road. This District is supplied water from the two Town of Dryden NYSEG Tanks which have capacities of 200,000 and 400,000 gallons. The distribution system is a combination of 12 and 8-inch pipe and adequately serves the domestic and fire needs of the district. The NYSEG Tanks are filled through the Varna Pump Station at the east end of the Water District No. 1 (Varna system).

The Hall Road Water District serves the Vanguard property adjacent to Rte 13. This District is also supplied from the two Town of Dryden NYSEG Tanks through the Monkey Run Water District piping. The distribution system is a combination of 12 and 8-inch pipe.

The Turkey Hill Water District serves properties on Rte 366, Mount Pleasant Road, Turkey Hill Road, Observatory Circle, Forest Lane and Monkey Run Road. This District is supplied water from the two Town of Dryden NYSEG Tanks through the Monkey Run Water District piping. The distribution system consists of 8-inch pipe.

The Royal Road Water District serves 6 commercial properties on Royal Road. This District is supplied water from the two Town of Dryden NYSEG Tanks through the Monkey Run Water District piping. The distribution system consists of 8-inch pipe.

The Snyder Hill Water District serves properties along Snyder Hill Road and Peregrine Way and is supplied water from the 500,000 gallon Town of Ithaca Hungerford Hill Tank through the Town of Ithaca distribution system. A booster pump station increases main pressure for domestic demands, but can not provide fire flow. The distribution system consists of 8-inch pipe.

**Identified Treatment Plant  
Deficiencies, Regulatory Compliance  
Problems, Complaints:  
N/A**

**Identified Limitations to Extending the Distribution System:**

The NYSEG storage tanks may have limited fire flow duration if future main extensions are added to the Monkey Run, Hall Rd, Turkey Hill Rd, Royal Road Districts. Additional tanks may be required to provide fire protection per current standards.

The Town is interested in extending water to the Cortland Road area (including TC3) which will include approximately 15 properties. The Village of Dryden system will require upgrades to make this possible.

**Approximate Population Served by Treatments Works: N/A**

**Approximate Number of Service Connections:**

- 274 Total (212 - Residential 62 - Commercial)
- WD#1 – 120
- Monkey Run WD – 18
- Hall Rd WD – 1
- Turkey Hill WD – 103
- Royal Road WD – 6
- Snyder Hill WD – 26

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Town of Dryden  
Contact: Jack Bush, Town Highway/DPW Superintendent  
Mary Ann Sumner, Town Supervisor  
Date: December 8, 2009

Phone No: 607-844-8888  
Fax No: 607-844-8008  
E-Mail: TownHighway@dryden.ny.us

Interviewed by:  
Andy Sciarabba/Dave Putnam

### Consultant's Remarks from Wastewater Treatment Works Tour:

N/A

Rated Capacity per NYSDEC SPDES Permit #: N/A Average Day Flow from DMR (last 12 months): N/A Maximum 30-day Flow from DMR (last 12 months): N/A

### General Description of Treatment Works Processes:

N/A

### General Description of Collection and Transmission Systems:

The Town of Dryden currently has 7 sewer Districts.

Sewer District No. 1 serves Meadowlark Road, Cardinal Drive and properties on the east side of Sapsucker Woods Road and runs by gravity to the Town of Ithaca system. Flows then travel through the Town of Ithaca and Village of Cayuga Heights collection systems to the Village of Cayuga Heights Wastewater Treatment Plant. The collection system includes 8-inch ACP pipe.

Sewer District No. 2 serves the Varna area and runs by gravity to the Varna Pump Station. This station has (2) 535 gpm pumps and lifts sewage to the joint Cornell/Dryden 18" transmission main on Rte 366 through a 6" cast iron force main. Flows then travel through the Cornell and City of Ithaca collection systems to the Ithaca Area Wastewater Treatment Plant. The collection system includes 8-inch ACP pipe. Agreements currently exist between the Town and Cornell for apportioning of capacity in the joint 18" transmission main and any upgrades to the Varna Pump Station and Force Main. This district also has a small pump station, which serves Freese Road south of Fall Creek and pumps to the gravity main on Rte. 366.

The Snyder Hill Sewer District serves properties in the Peregrine Subdivision and runs by gravity to the Town of Ithaca system. Flows then travel through the Town and City of Ithaca collection systems to the Ithaca Area Wastewater Treatment Plant. The collection system includes 8-inch PVC pipe. This system will require the installation of a flowmeter at the Town of Ithaca line if the district is enlarged.

The Monkey Run Sewer District serves properties on Rte 366 north of Varna, Barr Road and Abbot Road. The Monkey Run Road area runs by gravity to Sewer District No. 2 gravity system and the Varna Pump Station and is a combination of 10 and 8-inch PVC pipe. The Hanshaw Road (Armory) area runs by 8-inch PVC gravity piping to the Lower Creek Road Pump Station then is pumped through a 6" PVC force main to the Monkey Run gravity system on Rte 366.

The Turkey Hill Sewer District serves properties on Rte 366, Mount Pleasant Road, Turkey Hill Road, Observatory Circle, Forest Lane and Monkey Run Road. The district runs by 8-inch PVC gravity piping to the Monkey Run gravity system.

The Royal Road Sewer District serves 6 commercial properties on Royal Road. The distribution system includes 1-1/4 to 2-inch PE force main and individual pump stations. The force main connects to the Monkey Run gravity system that flows to the Lower Creek Road pump station.

The Cortland Road Sewer District serves the area of the Town north of the Village of Dryden including TC3, Dryden HS/MS and the commercial properties along North Road. Sewage flows by gravity to the Village of Dryden and is treated at the Village of Dryden Wastewater Treatment Plant. The collection system includes 8-inch PVC pipe. This district also has a small pump station, which serves part of Mott Road and pumps to the gravity near the intersection of North Road.

The Vanguard property adjacent to Rte 13 is an out-of-district user. This property gravity feeds to its own pump station then sends sewage through a force main across Rte 13 to the Monkey Run Sewer District.

Portions of the William George Agency in the Town discharge sewage to the Village of Freeville collection system which is treated at the Village of Freeville Wastewater Treatment Plant. The remainder of the Agencies land is on private septic systems.

Approximately 4-6 properties along Sapsucker Woods Road are served as out-of-district users by the Town of Ithaca. A forcemain pumps sewage to the Town of Ithaca system.

**Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:**

N/A

**Identified Limitations to Extending the Collection System:**

There is some uncertainty on the availability of sewer units between the Town of Dryden and the Village of Cayuga Heights since the Kline Road bypass was installed. Until this is resolved no extensions will be allowed in the area of the Town adjacent to Sewer District #1.

Any extensions that will exceed the pumping capacity of the Varna Pump Station will require upgrades to the station as well as possible upsizing of the Cornell/Dryden Transmission main. These improvements will require entering into new agreements with Cornell.

Approximate Population Served by Treatments Works: N/A

Approximate Number of Service Connections:

306 Total (212 - Residential 94 - Commercial)

SD#1 - 46

SD#2 - 74

Snyder Hill SD - 26

Monkey Run SD - 18

Turkey Hill SD - 103

Royal Road SD - 6

Cortland Rd SD - 32

Hall Rd (Out-of-District User) - 1

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Village of Dryden Phone No: 607-280-1757 (cell) Interviewed by: Rory Waddell / John Andersson  
Contact: Ron Moore, Public Works Supervisor Fax No: 607-844-8120  
Date: November 17, 2009 E-Mail: Info@Dryden-NY.org / dpwdryden@frontiernet.net

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

South Street well house needs changes to gas chlorine room and electrical service for safety. Jay Street and Lake Road well houses look OK. Lee Road Reservoir was originally an open earthen pond; bottom has been concreted and a steel building erected over it, but it is outdated. Ferguson Road concrete tank was erected as a ground level tank in the 1960's, but now is buried with earth because of spalling problems.

Rated Capacity per NYSDEC Withdrawal Permit#:	Average Day Production (last 12 months):	Maximum Day Production (last 12 months):
WSA #7000 for 3 wells at Jay Street for total 150 gpm	195,000gpd (113,000 from South St; 80,000 from Jay, 2,000 from Lake Road wells.)	390,000 gpd (Estimated)
WSA #4744 for 2 wells at Lake Road for "their safe yield" (test well was 112 gpm)		
WSA #1875 for South Street Well for 100 gpm = 474 gpm or 0.68 MGD		
Installed capacity is 80 gpm at Jay; 80 and 85 gpm at Lake; and 120 gpm at South Street = 365 gpm or 0.53 MGD total.		

### General Description of Treatment Plant Processes or Groundwater Sources:

Drilled wells at 3 sites with gas chlorination for disinfection and Aqua Pure 125 to sequester iron and manganese, to 2 tanks floating on system. South Street well provides 60% of the water, Jay Street 40% and Lake Road less than 1%.

### Identified Treatment Plant Deficiencies, Regulatory Compliance Problems, Complaints:

Can't meet maximum day flow with best well out of service, but can easily meet the average flow.  
Lake Road wells are rarely used due to high iron.  
Approximate Population Served by Treatment Works: 2000 residents + TC3 + High School  
Approximate Number of Service Connections: 750 service connections

### General Description of Distribution and Storage Systems:

2 tanks: 0.5 MG Lee Road and 0.3 MG Ferguson Rd on well zone. One other zone (with 0.35 MG tank) at TC3 (pump and tank owned by TC3)

### Identified Limitations to Extending the Distribution System:

MRB Consultants provided an engineering report to Village Board 11/09 exploring: replacing both storage tanks and relocating Lee Rd tank to near Rt13 and TC3, locating an additional well, replacing some 4" mains, upgrading South Street well house, adding generators, and looping the East Main St. water main. Existing 1.5" main serving Properties in the Town of Dryden North of Lee Road is in marginal condition.  
Lee Road reservoir is in marginal condition (cracked concrete, animal entrance, subject to vandals). Development of the area around Ferguson Road tank depends on construction of a higher pressure zone with pumps and another tank.



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Village of Dryden Phone No: 607-280-1757 (cell) Interviewed by:  
Contact: Ron Moore, Public Works Supervisor Fax No: 607-844-8120 Rory Waddell / John Andersson  
Date: November 17, 2009 E-Mail: info@Dryden-NY.org

### Consultant's Remarks from Wastewater Treatment Works Tour:

New treatment process will incorporate little from the existing plant other than existing influent pumping station which will be upgraded and existing secondary clarifiers and Chlorine Contact Tanks. New mechanical bar screen and grit facilities will be constructed followed by two SBRs. The effluent will then flow to the secondary clarifiers and the CCTs with gas chlorination and dechlorination prior to discharge to the 3.5 mile outfall which picks up the effluent from the Freeville WWTP on its way to Fall Creek. The sludge will be treated in aerobic digesters prior to dewatering in a belt press. The sludge is currently dewatered in drying beds and disposed of by land application in Steuben County.

Rated Capacity per NYSDEC SPDES Permit Average Day Flow from DMR (last 12 months): Maximum 30-day Flow from DMR (last 12 months)  
#NY-002 9190: 0.4 mgd (30 day avg.) – 0.6 mgd from end of construction of upgrade + 2 months 0.31 mgd (3 months data) months): 0.329 mgd

### General Description of Treatment Works Processes:

New plant to be installed, will go to bid in December 2009. Plant process will be SBR based. The main driver behind the new plant installation is a new P limit of 1.0 mg/L.

The new plant will include Ferric Chloride Dosing to chemically precipitate P in addition to biological P removal from the SBR process. It is expected that the new plant will be operational by the middle of 2011

### Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:

Current Treatment Works does not meet requirements of new SPDES permit. New plant will address current deficiencies.

Approximate Population Served by Treatments Works: 2000 residents + TC3 + High School

Approximate Number of Service Connections: 750 service connections

### General Description of Collection and Transmission Systems:

The system has 1 pumping station that serves 6 dwellings. The remainder of the system is gravity fed.

### Identified Limitations to Extending the Collection System:

There is a sewer in Elm St that is undersized due to the rapid expansion of TC3, other than that there are no known limitations to extending the collection system. A Town Sewer District discharges to the Village system.



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Village of Freeville Phone No: 607-844-8301 (Village Hall) Interviewed by:  
607-745-8110 cell for PB  
Contact: Pat Brennan, Highway Superintendent Fax No: 607-844-4971 Rory Waddell / John Andersson  
Date: November 12, 2009 E-Mail: \_\_\_\_\_

### Consultant's Remarks from Wastewater Treatment Works Tour:

Operator noted that there was currently around 30 inches of sludge on the base of the primary lagoon which was low in comparison to what would have been expected. Operations are contracted to Cortland Wastewater.

Rated Capacity per NYSDEC SPDES Permit  
#NY-: 0.125 mgd 30 day avg.

Average Day Flow from DMR (last 12 months):  
0.04 mgd (May to October 2009)

Maximum 30-day Flow from DMR  
(last 12 months): .045 (May to October 2009)

### General Description of Treatment Works Processes:

Plant is 2 lagoons, one primary lagoon and then a secondary lagoon divided into two by a weir across the centre of the tank. All lagoons are aerated by 3 x 7.5 HP blowers only one of which generally operates. Following treatment in the lagoons the effluent is chlorinated with sodium hypochlorite and then discharged to the outfall (shared with the Village of Dryden) to Fall Creek about 2 1/2 miles away.

### General Description of Collection and Transmission Systems:

System contains 11 pumping stations the main one is on Johnson Rd. This station contains 2 x submersible sewage pumps and delivers the flow from the Village of Freeville. All sewage from the William George Agency for Children's Services flows by gravity to the plant.

### Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:

#### Identified Limitations to Extending the Collection System:

None known, but service outside the Village would require the creation of a Town sewer district.

Approximate Population Served by Treatments Works: approximately 750 people, including around 500 from the Village and around 250 from the William George Agency for Children's Services.

Approximate Number of Service Connections: 300 Estimated



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Village of Groton Phone No: 607-898-3966 Interviewed by: Rory Waddell / John Andersson

Contact: Charles Rankin, Village Clerk-Treasurer/ Administrator; Chad Shurtleff, Operator Fax No: 607-898-4177

Date: November 17, 2009 E-Mail: grotovvil@grotonny.org  
crankin55@grotonny.org

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

At Conger Blvd, two 12" wells in fenced areas are alternated in use. A 6" well in the building is not used. Village owns over 80 acres in Morton Works area on Old Stage Road; gated and partly fenced. Grit removal building is fenced in. Both tanks appear in good condition, as do the pumps for the higher pressure zone. Generator on site for pumps.

Rated Capacity per NYSDEC Withdrawal Permit: WSA #7010 for 3 wells at Conger Blvd for up to 600 gpm total; Morton Works (springs or infiltration galleries) up to their capacity, about 100 gpm reliably, often 140 or more. Two Conger Wells have 250 gpm pumps, a third well 100 gpm = 700 gpm or 1.0 MGD. Installed capacity is the same.

Average Day Production (last 12 months): 375,000 gpd

Maximum Day Production (last 12 months): 736,000 gpd

### General Description of Treatment Plant Processes or Groundwater

#### Sources:

Morton Works are infiltration galleries with grit removal, treated with microfiltration and gas chlorination. Originally developed 1920's. Pall Aria microfiltration added 2005.

3 Drilled wells at Conger Boulevard with gas chlorination for disinfection and Aqua Pure phosphate for iron/manganese sequestration.

### General Description of Distribution and Storage Systems:

2 tanks: 0.5 MG Clark Street tank serves most of Village on well pressure. 0.2 MG Elm Street tank in higher pressure zone serves east side of Village (pumps located at Clark St)

### Identified Treatment Plant Deficiencies, Regulatory Compliance

#### Problems, Complaints:

Clark St tank overflow needs improvement.

Morton Works Nitrate is close to 5 mg/l. (limit is 10 mg/l).

Morton Works Infiltration system manholes need locks.

### Identified Limitations to Extending the Distribution System:

Would need districts formed outside the Village.

Some small mains in system limit distribution to some areas.

Approximate Population Served by Treatments Works: 2470 (2000 census)

Approximate Number of Service Connections: Approximately 760 connections



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Village of Groton Phone No: 607-898-3966 Interviewed by:  
Contact: Charles Rankin, Village Clerk-Treasurer/ Administrator;  
Chad Shurtleff, Operator Fax No: 607-898-4177 Rory Waddell / John Andersson  
Date: November 17, 2009 E-Mail: grotonvil@grotonny.org

### Consultant's Remarks from Wastewater Treatment Works Tour:

Existing chlorine contact tank is being operated with a sludge blanket to achieve denitrification, some sludge carryover was observed to outfall. After the plant upgrade the existing Chlorine gas/sulphur dioxide gas for chlorination/dechlorination and the existing communitor will remain. Flow is measured at effluent flume.

Rated Capacity per NYSDEC SPDES Permit  
#NY-002.5585: Currently 0.35 MGD will increase to Average Day Flow from DMR (last 12 months): Maximum 30-day Flow from DMR (last 12  
0.5 mgd (30 day avg) after construction of upgrades in 0.328 mgd months): 0.427 mgd  
2011

### General Description of Treatment Works Processes:

Plant is currently an extended aeration activated sludge plant and will be upgraded to an SBR plant. The expected date when the upgraded plant will be operational is Spring 2011.  
The new plant will incorporate 2 x new SBR tanks. The existing aeration tanks will be converted to an aerobic digester and a flow equalization basin and new drum filters to be installed for phosphorus removal.  
Plant upgrade is for new phosphorus limit and for flow. Plant will have excess flow capacity when upgrade is complete. New sludge dewatering facilities including new sludge screw press will also be installed. The existing sludge drying beds will be retained as a backup. Sludge is disposed of at Seneca Meadows Landfill.

### Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:

Current plant has been exceeding capacity limit, however the flows have dropped since a local fish farm has ceased operation. The current flows are below the current permit and will be well below the new permit value.

Approximate Population Served by Treatments Works: 2470 (2000 census) with approx 15 residences not on sewer

Approximate Number of Service Connections: Approximately 620 connections

### General Description of Collection and Transmission Systems:

System is all gravity and is around 40 years old. No major issues other than issues due to the age of the system.

### Identified Limitations to Extending the Collection System:

No major limitations. Potential development includes an industrial area of approx 6 acres or the reactivation of the fish farm.  
Service outside the Village would require creation of Town Sewer District.



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Town of Ithaca Phone No: 607-273-1747 Interviewed by: \_\_\_\_\_  
Contact: Dan Walker, PE Fax No: 607-273-1704 David Herrick  
Date: January 6, 2010 E-Mail: dwalker@town.ithaca.ny.us

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

N/A

Rated Capacity per NYSDEC Withdrawal Permit :

N/A

Average Day Production (last 12 months):

N/A

Maximum Day Production (last 12 months):

### General Description of Treatment Plant Processes or Groundwater Sources:

N/A

### General Description of Distribution and Storage Systems:

The Town of Ithaca is a single, town-wide water district however not all lands in the Town presently have access to municipal water. The majority of Town customers are supplied treated water from the SCLIWC (Bolton Point). Lake shore properties along East Shore Drive and Taughannock Boulevard, together with the Renwick Heights neighborhood and several properties on Trumansburg Road near the City boundary are supplied treated water from the City of Ithaca.

There are eleven Town owned water storage tanks with a combined volume over 4.75 MG. The 18-inch and 16-inch diameter transmission mains owned and operated by Bolton Point stretch from the Burdick Hill Storage Tank in the Town of Lansing to the Pearsall Place pump station on South Hill. Town owned transmission mains extend from South Hill through the Inlet Valley to West Hill which link the Town's storage tanks and distribution systems in those areas to the Bolton Point supply. The Town of Ulysses water system is supplied Bolton Point water through the Town of Ithaca Woolf Lane pump station. The Town of Ulysses storage tank on Van Dorns Corners Road provides domestic and fire water storage for Town of Ithaca customers in the vicinity of Trumansburg Road and Iradell Road.

Ithaca College is connected to the Town's Danby Road tank zone and pumps Bolton Point water to it's independently owned and operated 0.5 MG storage tank and campus distribution system.

On East Hill, the Town's Hungerford Hill tank zone supplies water to the Town of Dryden Snyder Hill Water District. The Pine Tree Road tank zone currently serves the Cornell University properties along Pine Tree Road including the East Hill Plaza.

In the Northeast area, that portion of the Cornell Business and Technology Park in the Village of Lansing and south of NYS Route 13 is connected to the Town's Sapsucker Woods tank zone. This tank zone is also the source of supply for Town of Dryden Water District No. 1 (Varna area).

**Identified Treatment Plant  
Deficiencies, Regulatory Compliance  
Problems, Complaints:  
N/A**

**Identified Limitations to Extending the Distribution System:**

The distribution main on Danby Road in the South Hill area is 6-inch diameter between West King Road and the Ithaca Facility and is not looped. The small diameter main limits available fire flow along this stretch of Danby Road. The Town is planning to replace the main with at least 8-inch pipe. Also in the South Hill area, there are low static and residual pressures in the Southwoods Subdivision on East King Road which is served by the Troy Road tank zone. Available fire flow within the development is limited. The Town is presently evaluating what system improvements to implement to enhance fire protection.

The Pine Tree Road tank zone includes a length of 6-inch diameter pipe between Snyder Hill Road and Ellis Hollow Road that limits the available fire flow to the commercial and high density residential properties surrounding the East Hill Plaza. The recent construction of the Bolton Point East Hill Tank on Hungerford Hill affords an opportunity to create a new higher pressure zone for these customers and should be considered for any subsequent developments.

The Distribution main on East Shore drive is old 6-inch cast iron pipe and is a linear system. The small diameter line limits fire flow and the fragility of the old pipe limits the amount of pressure and hydraulic surges that the pipe can handle. Because of the limitations of the pipe the Town is currently supplying the area from the City of Ithaca gravity system. The Town has prepared plans to replace the water main with a 12-inch pipe which will allow the main to be connected to the Remington Road water main which is supplied from the Village of Cayuga Heights distribution system which is part of the Bolton Point system. This will provide adequate pressure and fire flow. The 12-inch main has been sized to provide for future supply needs if it is extended to the Bolton Point water plant in the future.

Approximate Population Served by Treatments Works: N/A

Approximate Number of Service Connections: 3200

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Town of Ithaca Phone No: 607-273-1747 Interviewed by: \_\_\_\_\_  
Contact: Dan Walker, PE Fax No: 607-273-1704 David Herrick  
Date: January 6, 2010 E-Mail: dwalker@town.ithaca.ny.us

### Consultant's Remarks from Wastewater Treatment Works Tour:

N/A  
Rated Capacity per NYSDEC SPDES Permit #: N/A Average Day Flow from DMR (last 12 months): N/A Maximum 30-day Flow from DMR (last 12 months): N/A

### General Description of Treatment Works Processes:

N/A  
The Town of Ithaca is a single, town-wide sewer district however not all lands in the Town presently have access to municipal sewer. There are six distinct geographic service areas:

The West Hill collection system serves properties on and adjacent to Trumansburg Road, Mecklenburg Road, West Haven Road and Elm Street. The sewer mains along these highway corridors connect to jointly owned interceptor pipes in the City. The three interceptors converge near the Buffalo Street bridge at the Flood Relief Channel. A combination of gravity and low pressure (siphon) piping convey flow over and under the Channel, respectively. Lake front parcels along Taughannock Boulevard from the City boundary to the Ulysses (T) border are also served by a Town sewer main. The Taughannock Boulevard main connects to a jointly owned interceptor pipe and pump station in Cass Park. A force main from the pump station extends beneath the Cayuga Inlet to Pier Road.

The Inlet Valley system extends from a jointly owned interceptor on Floral Avenue and serves parcels along Five Mile Drive, Elmira Road and NYS Route 327. A siphon beneath the Flood Relief Channel discharges to a pump station in the Cherry Street industrial park. There are no known capacity issues in the collection mains and siphon.

Sewer mains throughout the South Hill neighborhoods converge at jointly owned interceptors in the City on Aurora Street, Hudson Street and Crescent Place. The Danby Road corridor serves the majority of the Ithaca Colleges facilities, the South Hill Business Campus and the commercial uses in the vicinity of the West King Road intersection. Pipe capacities are reportedly adequate for present and future discharges. Customary replacement of aging pipe is currently being considered. The collection system along Coddington Road serves a limited number of residential customers between the City boundary and West Northview Road. Therm and the residential neighborhoods in the vicinity of Pennsylvania Avenue, Northview Road, Troy Road and East King Road (Southwoods and Deer Run developments) connect to the interceptor at Crescent Place.

The East Hill system includes extensions of jointly owned interceptors on East State Street/Slaterville Road from the City boundary to Burns Road and on Mitchell Street from the City boundary to Summerhill Lane. Collection pipes serving residential and institutional uses on Pine Tree Road, Honness Lane, Snyder Hill Road and the Eastern Heights neighborhood connect to the Slaterville Road interceptor. Commercial and high density residential properties surrounding the East Hill Plaza discharge through the Mitchell Street interceptor.

The Northeast system basically includes the Town's sewer infrastructure in the vicinity of the Warren Road and Hanshaw Road corridors north of the Cornell University Campus. Sewage from the residential and institutional properties is ultimately discharged into the Village of Cayuga Heights collection system and treated at the Village of Cayuga Heights Wastewater Treatment Plant.

The Lake Street system includes gravity collection mains along Lake Street and throughout the Renwick Heights neighborhood which extend from a jointly owned interceptor at the Ithaca High School. The East Shore Drive properties, including a few City parcels adjacent to Stewart Park, drain to a jointly owned pump station which lifts sewage to the Lake Street main.

**Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:**  
N/A

**Identified Limitations to Extending the Collection System:**

There are occasional wet weather capacity problems with the jointly owned interceptor mains that serve the West Hill and East Hill collection systems. The existing siphon under the Flood Control Channel at Buffalo Street, which serves the Town's collection systems on Trumansburg Road and Elm Street, is flow limited when high rates of infiltration and inflow surcharge the interceptor pipes on Inlet Island. Construction of a new interceptor in the Town connecting the mains on Trumansburg Road and Taughannock Boulevard to a new pump station and force main opposite Third Street Extension is a possible long-term solution being considered.

On East Hill, segments of jointly owned interceptors within the City on East State Street and below Valentine Place can be flow limited when high rates of inflow and infiltration exceed pipe capacities. While the City and Town are aware of the conditions there are no immediate plans to replace or augment the capacity of the existing pipes.

Approximate Population Served by Treatments Works: 8,000

Approximate Number of Service Connections: 3,219

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Town of Lansing

Phone No: 607-533-8896

Interviewed by:

Contact: Scott Pinney, Supervisor; Bud Shattuck, Councilman; Jeff Overstrom, Engineer and Planning

Fax No: 607-533-3507

David Herrick

Date: December 23, 2009

E-Mail: asp243@towny.ir.com

**Consultant's Remarks from Water Treatment Plant or Well Site Tour:** Source of supply is SCLIWC.

Rated Capacity per NYSDEC Withdrawal Permit : N/A

Average Day Production (last 12 months): N/A

Maximum Day Production (last 12 months): N/A

### General Description of Treatment Plant Processes or Groundwater Sources:

NA

### General Description of Distribution and Storage Systems:

The contiguous Town distribution system includes 4 water storage tanks that feed more than 10 individual pressure zones. Two additional isolated extensions from adjacent neighboring municipalities (Town of Ithaca and Village of Lansing) exist along E. Shore Drive. There are also two booster station systems that serve a limited number of residential connections where gravity distribution is presently not available at higher ground elevations. The Town has previously combined individual districts to form a single benefit area known as the Consolidated Water District. There have been 2 recent extensions of the CWD on Lansing Station Road and Drake Road.

Village Circle Tank and Bean Hill Tank – The combined storage volume of these two companion tanks is 1.35 MG. Both tanks are supplied by the Burdick Hill Pump Station which has a direct connection to the SCLIWC transmission system. The distribution piping is at least 8 inch diameter throughout that portion of the South Lansing area served by these tanks. The pipe network is fairly well looped between Cherry Road, North Triphammer Road, Peruville Road and Warren Road.

Wilson Road Tank – Supplied by the Village Circle/Bean Hill grid, the 0.2 MG tank provides service to the Lansing Central School District and surrounding residential neighborhoods in Ludlowville and Myers Park.

Emmons Road Tank – Supplied by the Pine Grove Pump Station in Ludlowville, this 0.25 MG tank provides volume and pressure for lands between Ludlowville Road and Milliken Station Road along the Ridge Road (NYS Route 34) corridor.

**Identified Treatment Plant  
Deficiencies, Regulatory  
Compliance Problems,  
Complaints:**

NA

**Identified Limitations to Extending the Distribution System:**

The higher ground elevations in the vicinity of the Bean Hill Tank (Grandview Drive) and Village Circle Tank (east of Warren Road) result in lower supply pressure for adjacent customers. Municipal or individual booster pumps have been needed to augment service. The creation of a higher pressure zone along the east boundary of the Town is being considered. Capacity in the Burdick Hill Pump Station will have to be increased as more connections within the CWD are added. Utilizing the SCLIWC Burdick Hill Tank for supplying more of the Town's pressure zones will reduce demand and electrical consumption at the Burdick Hill Pump Station. New piping must be installed in the vicinity of Drake Road and Atwater Road to facilitate this improvement.

Approximate Population Served by Treatments Works: 3,670

Approximate Number of Service Connections: 1,433

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

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Municipality: Town of Lansing Phone No: 607-533-8896 Interviewed by:  
Contact: Scott Pinney, Supervisor; Bud Shattuck, Councilman; Jeff Overstorm, Engineer and Planning Fax No: 607-533-3507 David Herrick  
Date: December 23, 2009 E-Mail: asp243@twcny.ir.com

**Consultant's Remarks from Wastewater Treatment Works Tour:** N/A – Sewage from the Town's Cherry Road Sewer District is treated at the Village of Cayuga Heights WTP.

Rated Capacity per NYSDEC SPDES Permit #: N/A Average Day Flow from DMR (last 12 months): N/A Maximum 30-day Flow from DMR (last 12 months): N/A

**General Description of Treatment Works Processes:** N/A      **General Description of Collection and Transmission Systems:**

Only a small area of the Town, known as the Cherry Road Sewer District, currently has sewer service. The Borg-Warner plant on Warren Road and residential subdivisions on Horizon Drive are connected with 8 inch mains to the Village of Lansing collection system on Bush Lane.

The Warren Road Sewer District was recently established to facilitate extending sewer service to institutional, commercial and multifamily properties along Cherry Road, Warren Road, Dutch Mill Road and Farrell Road. Construction will begin in 2010. The new main will connect to the existing Town system on Horizon Drive.

**Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:** N/A      **Identified Limitations to Extending the Collection System:**

There is no sewer system in the Village of Lansing west of N. Triphammer Road and north of Oakcrest Road. Further extensions of collection mains in the south end of the Town will necessitate construction of transmission mains and interceptor sewers through the Village.

Approximate Population Served by Treatments Works: 145

Approximate Number of Service Connections: 62



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Village of Lansing Phone No: 607-257-0424 x 3 Interviewed by: \_\_\_\_\_  
Contact: Don Hartill, Mayor; John Courtney, Superintendent of PW; Ben Curtis, Code Enforcement Officer Fax No: 607-257-0226 Andy Sciarabba/Dave Putnam  
Date: December 22/28, 2009 E-Mail: dpw@vlansing.org

**Consultant's Remarks from Water Treatment Plant or Well Site Tour:** N/A- Supply is from SCLIWC.

Rated Capacity per NYSDEC Withdrawal Permit : Average Day Production (last 12 months): Maximum Day Production (last 12 months):  
N/A N/A N/A

### General Description of Treatment Plant Processes or Groundwater Sources:

N/A  
The Village is served by gravity from 4 tank pressure zones and several smaller areas within these zones are served by pressure reducing stations.

The Village Circle Tank is a 1,000,000 gallon tank owned by the Town of Lansing. This tank serves the area east of Warren Road north of NYS Route 13 with 8, 10 and 12-inch cast or ductile iron pipe.

The Sapsucker Woods Tank is a 500,000 gallon tank owned by the Town of Ithaca. This tank serves the area east of Warren Road south of NYS Route 13 with 8 and 12-inch cast or ductile iron pipe.

The Airport Ground Tank is a 500,000 gallon tank owned by the Village of Lansing. This tank serves the area east of North Triphammer Road to Warren Road and the Shops at Ithaca Mall with 8 and 12-inch cast or ductile iron pipe.

The Burdick Hill Tank is a 1,500,000 gallon tank owned by the SCLIWC. This tank will serve the balance of the Village. Half of this area is fed by gravity and half by a PRV station with 8-inch cast or ductile iron pipe. This area of the Village used to be served by the Oakcrest Tank which was removed from service on 2/9/10 and the Village will share the cost of the construction of the Burdick Hill sister Tank with the SCLIWC as a replacement.

### Identified Treatment Plant Deficiencies, Regulatory Compliance Problems, Complaints:

N/A

There are no known limitations with the existing system. However the Village has been experiencing problems with numerous main breaks in the piping along Cayuga Heights Road, North Triphammer and Burdick Hill Roads. There are also a couple of areas that would be benefited by looping of existing pipes. About half of the North Triphammer piping was replaced when the road was reconstructed and the Village is looking into replacing the remainder.

Approximate Population Served by Treatments Works: 3500 Estimated

Approximate Number of Service Connections: 683



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Village of Lansing Phone No: 607-257-0424 x 3 Interviewed by:  
Contact: Don Hartill, Mayor; John Courtney, Superintendent of PW; Ben Curtis, Code Enforcement Officer Fax No: 607-257-0226 Andy Sciarabba/Dave Putnam  
Date: December 22 and 28, 2009 E-Mail: dpw@vlansing.org

**Consultant's Remarks from Wastewater Treatment Works Tour:** N/A - Flows are collected and treated at the village of Cayuga Heights WWTP.

**Rated Capacity per NYSDEC SPDES Permit #:** N/A **Average Day Flow from DMR (last 12 months):** **Maximum 30-day Flow from DMR (last 12 months):** N/A

### General Description of Treatment Works Processes:

N/A

Only a portion of the Village of Lansing has sewer service, which can generally be described as the south east 2/3's of the village and all of the area of the Village south of Route 13.

The Village sanitary sewer system south of NYS Route 13 is an extension of the mains in the Village of Cayuga Heights. There are two connections to the VCH system; the corner of Uptown Road and Burleigh Drive and the intersection of Berkshire and Highgate Roads.

Sewers that were installed prior to the formation of the Village in 1974 are mainly 8-inch ACP and are generally located north of Route 13 in the vicinity of N. Triphammer Road, Graham Road, Dart Drive and Warren Road along with the sewers west of Warren Road and south of Route 13. More recent re-construction and extensions within this area have been with 8-inch PVC pipe.

The remainder of the sewer portion of the Village along Cedar Lane, Beckett Way, Oakcrest Road and Bush Lane consists of 8 to 15-inch ABS Truss pipe installed in 1982. The 15-inch interceptor pipe connects to the inlet side of the VCHWWTP. The Town of Lansing further extends this system north from two connections on Bush Lane. A recent pipe capacity analysis on this section of the Village system indicates that extension of sewer service to the Town of Lansing (Warren Road Sewer District) can be accommodated in addition to the historical increases in flow within the Village's service area. Extensions of the 1982 sewer system within the Village are generally PVC pipe.

**Identified Treatment Works  
Deficiencies, Regulatory  
Compliance Problems,  
Complaints:  
NA**

**Identified Limitations to Extending the Collection System:**

No sections have been identified as having capacity issues. Expansion of sewer service into the northwest portion of the Village would require extending the 15-inch transmission main a considerable distance and possibly trigger upgrades to the VCHWTP or additional flow diversions to IAWTF.

Approximate Population Served by Treatments Works: 3000 Estimated

Approximate Number of Service Connections: 561

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Town of Newfield

Phone No: 607-327-1751

Interviewed by:

Contact: Rob Brewer - Water Superintendent

Fax No: 607-564-7329

Andy Sciarabba

Date: November 19, 2009

E-Mail: rbrewer275@aol.com

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

Town supply is from 4 wells. The Armstrong well is a 6" well approximately 163' deep capable of delivering 90 gpm. The two original Pine Circle Wells are 8" wells approximately 100' deep capable of delivering 180 gpm each. The third Pine Circle Well is an 8" well approximately 134' deep capable of delivering 55 gpm.

Rated Capacity per NYSDEC Withdrawal Permit #: Average Day Production (last 12 months): Maximum Day Production (last 12 months):  
WSA #5,525(1968) 200 gpm 157,000 gpd (Jan-Oct 2009) 195,000 gpd  
WSA # 10,711 (2005) 200 gpm and 300,000 gpd

### General Description of Treatment Plant

#### Processes or Groundwater Sources:

Groundwater quality and level have remained consistent over the last 35 years. Liquid chlorine is injected for disinfection and to maintain appropriate residual levels in the distribution system. Aquapure (a sequestering agent) is being injected at the Pine Circle Wells for controlling iron and manganese.

### General Description of Distribution and Storage Systems:

The Town of Newfield currently has 3 water Districts. Water District No. 1 serves the Main Street area of the Town. This District is fed off the 200,000 gallon Trumbull Corners Tank. The distribution system includes 6-inch ACP pipe.  
Water District No. 2 serves the Inlet Valley Area on NYS Rte 34 & 96. This facility is fed off two tanks. The Main Street Tank is a 150,000 gallon transfer tank which fills the 300,000 gallon Shelter Valley Tank which supplies the District. The distribution system includes 10 and 8-inch pipe.

The Frandsen Water District serves 2 lots along NYS Rte 13 just north of the intersection of South Main Street and Rte 13. This district is fed off the 200,000 gallon Trumbull Corners Tank. The District will tap in to the 8-inch main installed as part of WD#2 and serve 144 affordable-housing units and an existing residence.

### Identified Treatment Plant Deficiencies,

#### Regulatory Compliance Problems, Complaints:

None noted.

### Identified Limitations to Extending the Distribution System:

WD#1 and the Frandsen WD are served only by the Trumbull Corners Tank. There is no redundancy for the Trumbull Corners Tank so if the Tank is out of service there will be no water to either District. Extension of water to properties at higher elevations will require a higher tank grid to provide service. Piping in WD#1 is 6-inch and aging. Portions of the system may need replacement in the next 10-15 years. Current fire flows are adequate but future flows may be limited by pipe size.

Approximate Population Served by Treatments Works: 1815 current without Frandsen. Future WD#1 – 1130, WD#2 – 1130, Frandsen WD – 148

Approximate Number of Service Connections: WD#1 – 345, WD#2 – 66, Frandsen WD – 3



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Town of Newfield

Contact: Rob Brewer - Water Superintendent

Date: November 19, 2009

Phone No: 607-327-1751

Interviewed by:

Fax No: 607-564-7329

Rory Waddell, Andy Sciarabba

E-Mail: rbrewer275@aol.com

### Consultant's Remarks from Wastewater Treatment Works Tour:

Rated Capacity per NYSDEC SPDES Permit #NY0110752: 0.03 mgd (30 day average)

Average Day Flow from DMR (last 12 months): .04 mgd from November 08 to May 09 (DMRs every 6 months)

Maximum 30-day Flow from DMR (last 12 months): .04 mgd

### General Description of Treatment Works Processes:

The treatment works consists of 2 x 5,700 gallon settling tanks which discharge into another 5,700 gallon tank. There are 2 x 7.5 HP pumps that transfer the effluent to 4 x absorption fields for distribution. The distribution between the fields is controlled by ball valves. It is automatically controlled based on the pump start time and alternates between the fields. The pumps are Flygt 3127.180. The well empties in about 4.5 minutes and if the pumps fail the effluent will overflow and flow by gravity into the fields. There is space available on site to add an additional 2-4 fields.

### General Description of Collection and Transmission Systems:

The collection systems have been recently checked and manhole covers replaced where necessary to minimize I/I. The flow rates have not reduced and are similar during dry and wet periods. New pump controllers have recently been installed. The previous pump controllers had problems with monitoring the phases of the incoming power supply and would allow pumps to continue running on one active phase. Pumping Station #3 previously had issues with surges or lighting strikes and has been upgraded to provide telemetry to record outages.

### Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:

The plant and system has been exceeding permitted flow and have been in discussions with DEC about non-compliance with the permits. The Town has undertaken work to attempt to reduce the flows without success. Due to the mitigation work carried out by the Town they have received a DEC letter stating that the conditions imposed by DEC had been met and that they were in compliance for 2009. DEC is apparently not too concerned at this point and the next step will probably be for the Town to apply for an increase in the permit and expand the absorption fields.

### Identified Limitations to Extending the Collection System:

In order to upsize the collection system Pumping station #3 would need to be relocated and upsized and the Main St. sewer extended. Pumping station #2 is a 170 gpm station with a 6" force main. All of the sewer was installed in 1984.

Approximate Population Served by Treatments Works: Unknown.

Approximate Number of Service Connections: 189







# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Village of Trumansburg Phone No: 607-280-8501 Interviewed by: \_\_\_\_\_  
Contact: Bruce Vann, DPW Supervisor Fax No: 607-387-5806 Rory Waddell / John Andersson \_\_\_\_\_  
Date: November 12, 2009 E-Mail: \_\_\_\_\_

### Consultant's Remarks from Wastewater Treatment Works Tour:

Plant is operated by Yaws environmental lab on behalf of the village. The site is tight and there is little room for expansion. The village does own additional land around the existing plant, however to expand the plant a major reconfiguration of the tank layout and process piping would be required. The final settling tanks appear to be short circuiting with a dead zone in the end of the tank; capacity may be increased if this was modified.

Rated Capacity per NYSDEC SPDES Permit: \_\_\_\_\_  
#NY-0024902: 0.25mgd (30 day average)

Average Day Flow from DMR (last 12 months): \_\_\_\_\_  
0.150 (7 months data) Maximum 30-day Flow from DMR (last 12 months): \_\_\_\_\_  
0.23 mgd (7 months)

### General Description of Treatment Works Processes:

Influent to the plant is through a comminutor with a bypass bar-screen. The flow then passes through a grit trap with air lift pumps and a grit washer.  
General treatment is by 2 x activated sludge tanks then 2 x final settling tanks. RAS is air lifted from the final settling tanks into the influent channel to the aeration tanks. 3 x blowers – duty / assist / standby are used for aeration.  
There is UV and hypochlorite backup for disinfection. The hypo has been operated due to fecal coliform issues with UV alone. Prior to the UV disinfection the effluent passes through an upflow sand filter with post aeration for DO control. Ferric Chloride is dosed in the influent channel to the FSTs for P removal.  
The sludge is treated in aerobic digesters prior to dewatering by a belt press which is operated around once a month. The dewatered cake is disposed of by land application in Seneca County.

### Identified Treatment Works Deficiencies, Regulatory Compliance Problems,

#### Complaints:

The grit air lift pumps, are unreliable and require regular maintenance.  
The existing UV system does not control fecal regrowth in the receiving stream and additional disinfection with sodium hypochlorite is necessary. This then leads to difficulties in meeting Chlorine Residual limits at the outfall.  
Approximate Population Served by Treatments Works: approximately 1600 people  
Approximate Number of Service Connections: approx 750

### General Description of Collection and Transmission Systems:

Flow to the plant is by gravity. There are two small pumping stations in the network, one on South St and one on Prospect St, these pump into the gravity network.

### Identified Limitations to Extending the Collection System:

There are no known bottlenecks or problem areas in the system.  
Any extensions outside the Village would require the formation of Town Sewer Districts.



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Town of Ulysses

Phone No: 607-387-5767

Interviewed by:

Contact: Roxanne Marino/Town Supervisor  
Doug Austic Water Superintendent

Fax No: 607-387-5843

Andy Sciarabba

Date: December 9, 2009

E-Mail: tousuper@twcny.rr.com

Consultant's Remarks from Water Treatment Plant or Well Site Tour: N/A

Rated Capacity per NYSDEC Withdrawal Permit : N/A

Average Day Production (last 12 months): N/A

Maximum Day Production (last 12 months): N/A

**General Description of Treatment Plant Processes or Groundwater Sources:**

N/A

**General Description of Distribution and Storage Systems:**

The Town of Ulysses currently has 4 water Districts. Water District No. 1 serves the Cayuga Addiction Recovery Services facility on Rte 227. This facility is fed off the 500,000 gallon Village of Trumansburg Tank. The facility is served by a 4-inch lateral off an 8-inch main. Water District No. 2 serves the Sure Save grocery store on NYS Rte 96. This facility is fed off the 500,000 gallon Village of Trumansburg Tank.

Water District No. 3 serves properties along NYS Rte 96 in the Hamlet of Jacksonville, Cold Springs Road, Swamp College Road, Jacksonville Road, Perry City Road and Van Dorn Corners Road. This district is fed off the 200,000 gallon Town of Ulysses Tank located on the corner of Iradell and Van Dorn Corners Roads. The distribution system includes a 12-inch pipe and was intended to adequately serve the domestic and fire needs of the district. Water is supplied to the District through the Wolf Lane pump station located in the Town of Ithaca. The water supplier is the SCLIWC. The agreement with the Town allows Ulysses to draw up to 159,000 gpd. Water District No. 4 serves three properties on Dubois Road just north of the Town of Ulysses/Ithaca border. This district is fed off the 500,000 gallon Town of Ithaca T-Burg Road Tank. The agreement with the Town allows Ulysses to draw up to 3,000 gpd.

**Identified Treatment Plant Deficiencies, Regulatory Compliance Problems,**

**Complaints:**

N/A

**Identified Limitations to Extending the Distribution System:**

The moratorium in the Village of Trumansburg restricting any further water main extensions limits extensions into those areas of the Town adjacent to the Village boundary. Future extensions from the Town of Ithaca system could require updated to the Town of Ithaca infrastructure.

Approximate Population Served by Treatments Works: 1,600+/-

Approximate Number of Service Connections: WD#1 – 1, WD#2 – 1, WD#3 – 600, WD#4 – 4



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: Southern Cayuga Lake Intermunicipal Water Commission

Phone No: 607-277-0660

Interviewed by:

Contact: Paul F. Tunison

Fax No: 607-277-3056

John Andersson/David Herrick

Date: December 11, 2009

E-Mail: pft@twcny.rr.com

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

Rated Capacity per NYSDEC Withdrawal Permit # 6115:  
6.0 MGD

Average Day Production (last 12 months):  
2.61 MGD - 2008

Maximum Day Production (last 12 months):  
4.23 MGD - 2008

### General Description of Treatment Plant Processes or Groundwater Sources:

### General Description of Distribution and Storage Systems:

Pre-disinfection/oxidation with chlorine dioxide  
Coagulation  
Flocculation  
Sedimentation  
Filtration  
Post disinfection – gaseous chlorine  
Ph adjustment with sodium hydroxide

Treated storage:  
1.5 MG Burdick Hill Road Tank  
0.5 MG Sheldon Road Tank  
3.0 MG East Hill Tank

### Identified Treatment Plant Deficiencies, Regulatory Compliance Problems, Complaints:

### Identified Limitations to Extending the Distribution System:

None

The Burdick Hill Road Tank is in poor condition and is slated for replacement in the next 2-5 years. Distribution system extensions are the responsibility of the individual member municipalities.

Approximate Population Served by Treatments Works: 30,000

Current allocation of Average Day Production: Dryden(T) – 3.73%; Ithaca (T) – 52.39%; Lansing (T) – 15.48; Cayuga Heights (V) – 9.27%; Lansing (V) – 19.13%

Approximate Number of Service Connections: 6,525



# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Sewer Infrastructure

Municipality: Ithaca Area WWTP (City of Ithaca, Town of Ithaca, Town of Dryden)

Phone No: 273-8381 Interviewed by:

Dan Ramer – Chief Operator, Ithaca Area WWTP

Dan Walker – Senior Civil Engineer, Town of Ithaca

Eric Whitney – City of Ithaca

Jim Weber – Highway Superintendent / Director of Public Works, Town of Ithaca

David Herrick, Andy Sciarabba,  
Rory Waddell

Fax No: 273-8433

Date: November 19, 2009

E-Mail: dramer@cityofithaca.org

### Consultant's Remarks from Wastewater Treatment Works Tour:

There is significant additional capacity in the treatment works. The main area where capacity would be limited would be in the Final Settling Tanks and the Actiflo system. The Primary Settling Tanks are able to be run with one out of service except under very high flows and the aeration tanks are capable of being reconfigured if required to accept additional loading  
Flow monitoring is via a Parshall Flume in the effluent channel.

Rated Capacity per NYSDEC SPDES Permit #0026638: Average Day Flow from DMR (last 12 months): 6.22 MGD Maximum 30-day Flow from DMR (last 12 months): 9.83 MGD

### General Description of Treatment Works Processes:

Following screening, the plant has 2 each primary settling tanks, 4 each aeration tanks and 4 each final settling tanks. The flow then passes to the actiflo system for clarification. The sludge handling system incorporates 2 each sludge thickeners and (1) primary and (1) secondary digester. The sludge is then dewatered using a belt press. Grit is extracted from the primary sludge. The effluent is Chlorinated (with sodium hypochlorite) and then Dechlorinated with Sulphur Dioxide Gas. Approximately 2 million gallons / year of septage is also received at the plant.

### General Description of Collection and Transmission Systems:

There are capacity issues on a number of jointly owned interceptor lines that are being addressed. The East Hill / State St carrier has capacity issues. There are pinch points on the West Hill side also. Some I/I issues have been identified in the system and are being addressed. Generally it was noted that as capacity issues were identified they were being dealt with. The Town of Ithaca is also currently working on a Water and Sewer master plan.

## **Identified Treatment Works Deficiencies, Regulatory Compliance Problems, Complaints:**

The permit with the plant will expire in May 2010. It is expected that the Phosphorus limits may be reduced at this point in time, but the operators have no real insight into what the limit may be.

The digesters are currently very underloaded. The digester mixing is being upgraded with new linear motion mixers & the digester heating is being upgraded also. A new cogeneration system is also being proposed which may be built around microturbines.

Other issues noted were that the bar screens are coarser than desired and therefore some minor ragging issues are experienced in the plant. The installation of grit removal prior to the primaries would also assist in the process. Septage receiving facilities are being upgraded currently. There is also an upgrade of the leachate handling facilities planned for the future.

Other work currently underway includes an energy analysis plan and evaluation of the aeration system and an upgrade of the lab and staff room.

A flow splitter prior to the actiflo would be helpful to allow for controlled flow diversion in wet weather.

There is some movement and cracking in the tanks. The plant was originally constructed on static piles.

Approximate Population Served by Treatments Works: Unknown (39,560 Estimated)

Approximate Number of Service Connections: Unknown (8881 Estimated)

## **Identified Limitations to Extending the Collection System:**

The condition and capacity of jointly owned interceptor sewer are being dealt with as they arise. There are plans that could lead to 800 residential units being installed in the next 10 years.

# Countywide Inter-Municipal Water and Sewer Feasibility Study for Tompkins County

## Water Infrastructure

Municipality: City of Ithaca

Contact: Erik Whitney, P.E.  
Scott Gibson

Date: March 15, 2010

Phone No: 607-272-1717

Fax No: 607-277-5028

E-Mail: erikw@cityofithaca.org

Interviewed by:

David Herrick

### Consultant's Remarks from Water Treatment Plant or Well Site Tour:

The City is in the process of finalizing pilot test protocols for upgrading the Water Treatment Plant to membrane filtration technology.

Rated Capacity per NYSDEC Withdrawal Permit # TBD:

Average Day Production (2009 Water Report): 2.98 MGD

Maximum Day Production (Base on 1.5 times the Avg. Day Production): 4.47 MGD

### General Description of Treatment Plant Processes or Groundwater Sources:

The source of supply for the City system is Six Mile Creek. The Sixty-Foot Reservoir (also known as the Potters Falls Reservoir) has a reported safe yield of at least 5.4 MGD. The existing water treatment plant at Water Street has a capacity rating of 7.0 MGD. The current process includes chemical coagulation, flocculation, sedimentation, filtration and disinfection. Recent planning and detailed environmental examination of water supply options has been concluded and the selected alternative is to replace the existing plant with a membrane filtration plant capable of producing 4.0-6.0 MGD. The anticipated full scale membrane plant design will include complete coagulation, multi-stage flocculation and high rate clarification. The membrane technology will be either microfiltration or ultrafiltration. Disinfection will follow the treatment process.

### General Description of Distribution and Storage Systems:

Most of the water produced by the treatment plant is distributed by gravity from the two clearwell storage reservoirs at the plant site. The combined capacity of the clearwells is 1.43 MG. The Elm Street tank at the western limit of the City's gravity zone is a companion tank to the clearwells and has a storage volume of 1.5 MG. Two pumps at the plant draw water directly from the clearwells and discharge into higher tank zones. The 'Mitchell Street' pump station fills the Cornell Street (1.0 MG) and Coddington Road (1.0 MG) tanks. The 'East Ithaca' pump station fills the Maple Avenue (0.615 MG) tank. The third pump station at Vinegar Hill pumps water from the gravity zone into the Oakwood Lane (0.75 MG) tank and the Cliff Park (0.15 MG) tank. In total, there is a gross storage volume of over 6.4 MG in the City system. Given the loss of demand by Town of Ithaca customers in the Inlet Valley and West Hill areas, the City has temporarily drained the Elm Street tank until average daily consumption within the balance of the gravity zone increases and causes a satisfactory turn over of water in the tank. The transmission and distribution mains in the gravity system are relatively well looped. Larger diameter mains generally run north/south along the primary City streets with smaller mains running east/west. That portion of the City distribution system north of Fall Creek in the Cornell Heights neighborhood is presently served by Cornell University. Following the completion of the City's treatment plant upgrades and improvement in distribution system water quality, service to the neighborhood from the City system will likely be restored.

**Identified Treatment Plant Deficiencies, Regulatory Compliance Problems, Complaints:**

To comply with the EPA's Disinfection Byproduct Rule the City's water treatment plant will require significant upgrades.

Approximate Population Served by Treatments Works: 30,000

Approximate Number of Service Connections: 5,400

**Identified Limitations to Extending the Distribution System:**

To support necessary fire flow demands in the commercial and retail centers along Elmira Road and to improve water quality in the western limits of the City's gravity zone, it is expected that future developments in the Southwest Area will need to complete a pipe loop between the main at the Lowe's site and a dead-end main on Cherry Road.